

LilyPond

Il compositore tipografico per la musica

Utilizzo

Il team di sviluppo di LilyPond

Questo manuale spiega come eseguire i programmi distribuiti con LilyPond versione 2.13.58. Inoltre, suggerisce alcune delle “migliori pratiche” per un uso efficiente.

Per maggiori informazioni su come questo manuale si integra col resto della documentazione, o per leggere questo manuale in altri formati, si veda [Sezione “Manuals” in Informazioni generali](#). Se ti manca qualche manuale, puoi trovare la completa documentazione all’indirizzo <http://www.lilypond.org/>.

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Per la versione di LilyPond 2.13.58

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1 Eseguire lilypond

Questo capitolo descrive dettagliatamente gli aspetti tecnici dell'esecuzione di LilyPond.

1.1 Uso normale

La maggior parte degli utenti esegue LilyPond attraverso un'interfaccia grafica (GUI); se non lo hai già fatto, leggi il [Sezione “Tutorial” in Manuale di Apprendimento](#). Se usi un editor diverso per scrivere i file lilypond, leggi la documentazione di quel programma.

1.2 Uso da linea di comando

Questa sezione contiene informazioni aggiuntive sull'uso di LilyPond da linea di comando. Questo può essere utile per passare al programma opzioni ulteriori. Inoltre, ci sono alcuni programmi complementari di ‘aiuto’ (come `midi2ly`) che funzionano solo da linea di comando.

Con ‘linea di comando’ intendiamo la linea di comando del sistema operativo. Gli utenti Windows avranno più familiarità con i termini ‘shell DOS’ o ‘shell dei comandi’. Gli utenti MacOS X avranno più familiarità con i termini ‘terminale’ o ‘console’. Una configurazione ulteriore è necessaria per gli utenti MacOS X; si veda [Sezione “MacOS X” in Informazioni generali](#).

Descrivere come usare questa parte di un sistema operativo non rientra negli obiettivi di questo manuale; si prega di consultare altra documentazione su questo argomento se non si conosce la linea di comando.

Invocare lilypond

L'eseguibile `lilypond` può essere chiamato dalla linea di comando nel seguente modo.

```
lilypond [opzione]... file...
```

Se invocato con un nome di file senza estensione, viene tentata per prima l'estensione ‘.ly’. Per leggere l'input da stdin, usare un trattino (-) al posto di *file*.

Quando ‘file.ly’ viene elaborato, lilypond creerà ‘file.ps’ e ‘file.pdf’ come output. Possono essere specificati molti file; ognuno di essi sarà elaborato in modo indipendente.¹

Se ‘file.ly’ contiene più di un blocco `\book`, allora tutte le altre partiture verranno salvate in file numerati, a partire da ‘file-1.pdf’. Inoltre, il valore di `output-suffix` (suffisso di output) sarà inserito tra la base del nome del file e il numero. Un file di input che contiene

```
 #(define output-suffix "violin")
 \score { ... }
 #(define output-suffix "cello")
 \score { ... }
```

produrrà come output *base*‘-violin.pdf’ e *base*‘-cello-1.pdf’.

Comandi standard da shell

Se la shell (ovvero la finestra dei comandi) utilizzata supporta le normali redirezioni, potrebbe essere utile usare i seguenti comandi per dirigere l'output di una console in un file:

- `lilypond file.ly 1>stdout.log` per redirigere l'output normale
- `lilypond file.ly 2>stderr.log` per redirigere i messaggi di errore
- `lilypond file.ly &>all.log` per redirigere tutto l'output

Consulta la documentazione della tua shell per vedere se supporta queste opzioni o se la sintassi è diversa. Nota che questi sono comandi shell e non hanno niente a che fare con lilypond.

¹ Lo status di `GUILF` non viene resettato dopo l'elaborazione di un file .ly, quindi fare attenzione a non cambiare alcun valore predefinito dall'interno di Scheme.

Opzioni della linea di comando per lilypond

Sono contemplate le seguenti opzioni:

-e, --evaluate=espressione

Valuta l'*espressione* di Scheme prima di analizzare qualsiasi file `.ly`. Si possono specificare varie opzioni `-e`; verranno valutate in modo sequenziale.

L'espressione sarà valutata nel modulo `guile-user`, dunque se vuoi usare delle definizioni in *espressione*, usa

```
lilypond -e '(define-public a 42)'
```

nella linea di comando, e includi

```
$(use-modules (guile-user))
```

in cima al file `.ly`.

-f, --format=formato

Formati di output. Come *formato* si può scegliere tra `ps`, `pdf`, e `png`.

Esempio: `lilypond -fpng file.ly`

-d, --define-default=variabile=valore

Imposta l'opzione interna del programma, *variabile*, al valore di Scheme *valore*. Se *valore* non viene specificato, allora viene usato `#t`. Per disabilitare un'opzione, si può usare il prefisso `no-` prima della *variabile*, ad esempio

```
-dno-point-and-click
```

è equivalente a

```
-dpoint-and-click='#f'
```

Di seguito alcune opzioni interessanti.

'help' L'esecuzione di `lilypond -dhelp` mostrerà tutte le opzioni disponibili di `-d`.

'paper-size'

Questa opzione imposta la dimensione predefinita del foglio,

```
-dpaper-size=\"letter\"
```

Si noti che la stringa deve essere compresa tra virgolette precedute dal segno di escape (`\`).

'safe'

Non si fida dell'input nel file `.ly`.

Quando la formattazione di LilyPond viene messa a disposizione tramite un server web, si **DEVE** passare l'opzione `--safe` o l'opzione `--jail`. L'opzione `--safe` impedirà che il codice Scheme presente nell'input possa fare uno scempio, ad esempio

```
$(system "rm -rf /")
{
  c4~$(ly:export (ly:gulp-file "/etc/passwd"))
}
```

L'opzione `-dsafe` funziona valutando le espressioni Scheme presenti nell'input in uno speciale modulo di sicurezza. Questo modulo di sicurezza è derivato dal modulo GUILE `'safe-r5rs'`, ma aggiunge alcune funzioni del LilyPond API. Queste funzioni sono elencate in `'scm/safe-lily.scm'`.

Inoltre, la modalità sicura non permette le direttive `\include` e disabilita l'uso del backslash nelle stringhe `TEX`.

In modalità sicura, non è possibile importare le variabili di LilyPond in Scheme.

`-dsafe` *non* rileva il sovrautilizzo di risorse. È ancora possibile far sì che il programma rimanga in sospenso per un tempo indefinito, ad esempio alimentando il backend con strutture di dati cicliche. Dunque se si vuole usare LilyPond su un server web pubblicamente accessibile, si deve limitare il processo nell'uso della CPU e della memoria.

La modalità sicura bloccherà la compilazione di molti utili frammenti di codice LilyPond. L'opzione `--jail` è un'alternativa più sicura, ma richiede più lavoro per configurarla.

'backend' il formato di output da usare per il back-end. Per il **formato** si può scegliere tra

ps per PostScript.

I file Postscript includono i tipi di carattere TTF, Type1 e OTF. Non vengono inclusi i sottoinsiemi di questi tipi. Se si usa un set di caratteri orientali, si possono ottenere file di grosse dimensioni.

eps

per PostScript incapsulato. Invia ogni pagina (sistema) in un file **'EPS'** separato, senza font, e in un unico file **'EPS'** con tutte le pagine (sistemi) inclusi i font.

Questa è la modalità predefinita di `lilypond-book`.

svg

per ottenere SVG (Scalable Vector Graphics).

Crea un singolo file SVG, senza font incorporati, per ogni pagina dell'output. Si raccomanda di installare i font Century Schoolbook, inclusi nell'installazione di LilyPond, per una resa ottimale. In UNIX basta copiare questi font dalla directory di LilyPond (solitamente `'/usr/share/lilypond/VERSION/fonts/otf/'`) in `'~/.fonts/'`. L'output SVG dovrebbe essere compatibile con qualsiasi editor SVG o user agent.

scm

per estrarre i comandi di disegno grezzi e interni, basati su Scheme.

null non produce la stampa della partitura; ha lo stesso effetto di `-dno-print-pages`.

Esempio: `lilypond -dbackend=svg filename.ly`

'preview' Genera un file di output che contiene i titoli e il primo sistema del brano musicale. Se si usano i blocchi `\bookpart`, i titoli e il primo sistema di ogni `\bookpart` apparirà nell'output. I backend **ps**, **eps**, e **svg** supportano questa opzione.

'print-pages'

Genera tutte le pagine, come da impostazione predefinita. `-dno-print-pages` è utile in combinazione con `-dpreview`.

-h, --help

Mostra una sintesi dell'utilizzo.

-H, --header=CAMPO

Estrae un campo dell'intestazione nel file 'NOME.CAMPO'.

--include, -I=directory

Aggiunge *directory* al percorso di ricerca per i file di input.

È possibile assegnare più di un'opzione -I. La ricerca inizierà nella prima directory definita, e se il file da includere non viene trovato la ricerca continuerà nelle directory seguenti.

-i, --init=file

Imposta il file di inizializzazione su *file* (predefinito: 'init.ly').

-o, --output=FILE or CARTELLA

Imposta il file di output predefinito *FILE* oppure, se una cartella con quel nome esiste già, dirige l'output in *CARTELLA*, prendendo il nome del file dal file di input. Il suffisso appropriato verrà aggiunto (ad esempio .pdf per il pdf) in entrambi i casi.

--ps

Genera PostScript.

--png

Genera immagini di ogni pagina in formato PNG. Questo implica **--ps**. La risoluzione in DPI dell'immagine può essere impostata con

-dresolution=110

--pdf

Genera PDF. Questo implica **--ps**.

-j, --jail=utente,gruppo,gabbia,directory

Esegue lilypond in una gabbia chroot.

L'opzione **--jail** fornisce un'alternativa più flessibile a **--safe** quando la formattazione di LilyPond è messa a disposizione attraverso un server web o quando LilyPond esegue sorgenti provenienti dall'esterno.

L'opzione **--jail** modifica la radice di lilypond in *gabbia* appena prima di iniziare il vero processo di compilazione. L'utente e il gruppo vengono poi modificati per corrispondere a quelli forniti, e la directory corrente viene spostata in *directory*. Questa configurazione garantisce che non sia possibile (almeno in teoria) uscire dalla gabbia. Si noti che perché **--jail** funzioni lilypond deve essere eseguito come root; di solito questo si fa in modo sicuro col comando **sudo**.

Configurare una gabbia è una questione leggermente delicata, perché bisogna essere sicuri che LilyPond possa trovare tutto quello di cui ha bisogno per compilare il sorgente *dentro la gabbia*. Una configurazione tipica comprende i seguenti elementi:

Impostare un filesystem distinto

Si dovrebbe creare un filesystem separato LilyPond, così che possa essere montato con opzioni di sicurezza come **noexec**, **nodev**, e **nosuid**. In questo modo è impossibile lanciare degli eseguibili o scrivere su un dispositivo direttamente da LilyPond. Se non si vuole creare una partizione separata, si può creare un file di dimensioni ragionevoli e usarlo per montare un dispositivo di loop. Un filesystem separato garantisce anche che LilyPond non possa scrivere su uno spazio maggiore di quanto permesso.

Impostare un altro utente

Per eseguire LilyPond in una gabbia si dovrebbe usare un altro utente e gruppo (ad esempio, *lily/lily*) con pochi privilegi. Ci dovrebbe essere una sola directory scrivibile da questo utente, che dovrebbe essere passata in *dir*.

Preparare la gabbia

LilyPond ha bisogno di leggere alcuni file quando viene lanciato. Tutti questi file devono essere copiati nella gabbia, sotto lo stesso percorso in cui appaiono nel vero filesystem principale. Si deve copiare l'intero contenuto dell'installazione LilyPond installation (ad esempio, `/usr/share/lilypond`).

Se c'è un problema, il modo più semplice per individuarlo è lanciare LilyPond usando **strace**, che permetterà di scoprire quali file mancano.

Eseguire LilyPond

In una gabbia montata con **noexec** è impossibile eseguire qualsiasi programma esterno. Dunque LilyPond deve essere eseguito con un backend che non richieda tale programma. Come è già stato detto, deve essere eseguito con privilegi di superutente (che ovviamente perderà immediatamente), possibilmente con l'uso di **sudo**. È una buona idea limitare il numero di secondi di tempo della CPU che LilyPond può usare (ad esempio con **ulimit -t**), e, se il tuo sistema operativo lo supporta, la quantità di memoria che può essere allocata.

-v, --version

Mostra informazioni sulla versione.

-V, --verbose

Aumenta la prolissità: mostra i percorsi completi di tutti i file letti, e dà informazioni sui tempi.

-w, --warranty

Mostra la garanzia con cui viene distribuito GNU LilyPond. (Viene distribuito con **NESSUNA GARANZIA!**)

Variabili d'ambiente

lilypond riconosce le seguenti variabili d'ambiente:

LILYPOND_DATADIR

Specifica la directory predefinita in cui saranno cercati i messaggi della localizzazione e i file di dati. Questa directory deve contenere sottodirectory chiamate `'ly/`, `'ps/`, `'tex/`, etc.

LANG Determina la lingua per i messaggi di avvertimento.

LILYPOND_GC_YIELD

Con questa variabile si possono aggiustare il consumo di memoria e la performance. È una percentuale che regola il comportamento di gestione della memoria. Con valori più alti il programma usa più memoria, con valori più bassi usa più tempo della CPU. Il valore predefinito è 70.

LilyPond in una gabbia chroot

Configurare un server perché esegua LilyPond in una gabbia chroot è un lavoro complicato. La procedura è spiegata sotto. Gli esempi si riferiscono a Ubuntu Linux e potrebbero richiedere l'uso di **sudo** in alcune situazioni.

- Installa i pacchetti necessari: LilyPond, GhostScript e ImageMagick.
- Crea un nuovo utente dal nome **lily**:

```
adduser lily
```

Questo comando creerà anche un nuovo gruppo per l'utente **lily**, e una cartella home, `/home/lily`

- Nella cartella home dell'utente lily crea un file da usare come filesystem separato:

```
dd if=/dev/zero of=/home/lily/loopfile bs=1k count= 200000
```

In questo esempio è stato creato un file di 200MB da usare come filesystem della gabbia.

- Crea un dispositivo di loop, crea e monta un filesystem, quindi crea una cartella scrivibile dall'utente lily:

```
mkdir /mnt/lilyloop
losetup /dev/loop0 /home/lily/loopfile
mkfs -t ext3 /dev/loop0 200000
mount -t ext3 /dev/loop0 /mnt/lilyloop
mkdir /mnt/lilyloop/lilyhome
chown lily /mnt/lilyloop/lilyhome
```

- Nella configurazione dei server, JAIL sarà /mnt/lilyloop e DIR sarà /lilyhome.
- Crea un grande albero delle directory nella gabbia copiando i file necessari, come mostrato nello script di esempio più in basso.

Puoi usare sed per creare i comandi di copia necessari per un certo eseguibile:

```
for i in "/usr/local/lilypond/usr/bin/lilypond" "/bin/sh" "/usr/bin/"; \
do ldd $i | sed 's/.*=> \/(.*\|\/)\([^\(]*\)\/.*$/mkdir -p \1 \&\& \
cp -L \/\1\2 \1\2/' | sed 's/\t\/\/(.*\|\/)\(.*\) (.*)$$/mkdir -p \
\1 \&\& cp -L \/\1\2 \1\2/' | sed '/.*=>.*$/d'; done
```

Script di esempio per Ubuntu 8.04 a 32-bit

```
#!/bin/sh
## defaults set here

username=lily
home=/home
loopdevice=/dev/loop0
jaildir=/mnt/lilyloop
# the prefix (without the leading slash!)
lilyprefix=usr/local
# the directory where lilypond is installed on the system
lilydir=/${lilyprefix}/lilypond/

userhome=$home/$username
loopfile=$userhome/loopfile
adduser $username
dd if=/dev/zero of=$loopfile bs=1k count=200000
mkdir $jaildir
losetup $loopdevice $loopfile
mkfs -t ext3 $loopdevice 200000
mount -t ext3 $loopdevice $jaildir
mkdir $jaildir/lilyhome
chown $username $jaildir/lilyhome
cd $jaildir

mkdir -p bin usr/bin usr/share usr/lib usr/share/fonts $lilyprefix tmp
chmod a+w tmp

cp -r -L $lilydir $lilyprefix
cp -L /bin/sh /bin/rm bin
```

```

cp -L /usr/bin/convert /usr/bin/gs usr/bin
cp -L /usr/share/fonts/truetype usr/share/fonts

# Now the library copying magic
for i in "$lilydir/usr/bin/lilypond" "$lilydir/usr/bin/guile" "/bin/sh" \
  "/bin/rm" "/usr/bin/gs" "/usr/bin/convert"; do ldd $i | sed 's/.*=> \
  /\(.*\)\(^[^()]*\).*/mkdir -p \1 \&\& cp -L /\1\2 \1\2/' | sed \
  's/\t\(\(.*\)\(^[^()]*\)\(.*\)\(.*\)\(.*\)\$)/mkdir -p \1 \&\& cp -L /\1\2 \1\2/' \
  | sed '/.*=>.*\/d'; done | sh -s

# The shared files for ghostscript...
cp -L -r /usr/share/ghostscript usr/share
# The shared files for ImageMagick
cp -L -r /usr/lib/ImageMagick* usr/lib

### Now, assuming that you have test.ly in /mnt/lilyloop/lilyhome,
### you should be able to run:
### Note that $lilyprefix/bin/lilypond is a script, which sets the
### LD_LIBRARY_PATH - this is crucial
    $lilyprefix/bin/lilypond -jlily,lily,/mnt/lilyloop,/lilyhome test.ly

```

1.3 Messaggi di errore

Quando si compila un file possono apparire vari messaggi di errore:

Avvertimento

Qualcosa appare sospetto. Se stai cercando di fare qualcosa di insolito allora comprenderai il messaggio e potrai ignorarlo. Tuttavia di solito i messaggi di avvertimento indicano che il file di input ha qualcosa che non va.

Errore C'è qualcosa di assolutamente sbagliato. Il passo attualmente in elaborazione (analisi, interpretazione o formattazione) verrà completato, ma il passo successivo verrà saltato.

Errore fatale

C'è qualcosa di assolutamente sbagliato e LilyPond non può continuare. Questo accade raramente. La causa più tipica è un'errata installazione dei tipi di carattere.

Errore Scheme

Gli errori che capitano mentre si esegue del codice Scheme sono individuati dall'interprete Scheme. Se si esegue con l'opzione di prolissità (`-V` o `--verbose`), viene stampata una traccia della chiamata di funzione responsabile dell'errore.

Errore di programmazione

C'è stata una qualche incongruenza interna. Questi messaggi di errore servono ad aiutare programmatori e debugger. Di solito si possono ignorare. Talvolta sono talmente numerosi da nascondere il resto dell'output.

Sospeso (core dumped)

Segnala un serio errore di programmazione che ha mandato in crash il programma. Questi errori sono considerati critici. Se ti imbatti in un errore simile, invia una segnalazione di errori.

Se gli avvertimenti e gli errori possono essere collegati a una parte specifica del file di input, i messaggi di errore hanno la seguente forma

```
file:riga:colonna: messaggio
```

riga di input responsabile dell'errore

Nella riga responsabile si inserisce un a capo per indicare la colonna in cui è stato trovato l'errore. Ad esempio,

```
test.ly:2:19: error: not a duration: 5
{ c'4 e'
      5 g' }
```

Queste posizioni sono la migliore ipotesi di LilyPond a proposito del punto in cui l'avvertimento o l'errore sono comparsi, ma (per loro stessa natura) avvertimenti ed errori capitano quando succede qualcosa di imprevisto. Se non riesci a vedere un errore nella riga indicata del file di input, prova a controllare una o due righe sopra la posizione indicata.

Maggiori informazioni sugli errori si trovano in [Sezione 1.4 \[Errori comuni\]](#), pagina 8.

1.4 Errori comuni

Le condizioni di errore descritte di seguito capitano spesso, ma la causa non è ovvia né facile da trovare. Una volta che si sono viste e comprese, è facile gestirle.

La musica esce dalla pagina

Se la musica esce dalla pagina al di là del margine destro o appare eccessivamente compressa, quasi sempre è dovuto all'inserimento di una durata sbagliata di una nota, che fa sì che l'ultima nota di una misura si estenda oltre la barra di divisione. Non è sbagliato se la nota finale di una misura non termina entro la barra di divisione inserita automaticamente, perché semplicemente si assume che la nota continui nella misura successiva. Ma se si presenta una lunga sequenza di misure simili, la musica può apparire compressa o può uscire dalla pagina perché gli a capo automatici possono essere inseriti soltanto alla fine di misure complete, ovvero quando tutte le note finiscono prima o alla fine della misura.

Nota: Una durata sbagliata può inibire l'interruzione di linea, portando a una linea di musica estremamente compressa o a musica che esce dalla pagina.

La durata sbagliata può essere trovata facilmente se si usano i controlli di battuta, si veda [Sezione “Bar and bar number checks” in Guida alla Notazione](#).

Se si vuole davvero avere una serie di di tali misure sovrapposte bisogna inserire una barra di divisione invisibile nel punto in cui si vuole l'interruzione di linea. Per i dettagli si veda [Sezione “Bar lines” in Guida alla Notazione](#).

Appare un rigo in più

Se i contesti non sono creati esplicitamente con `\new` o `\context`, saranno creati senza avviso appena si incontra un comando che non può essere applicato a un contesto esistente. Nelle partiture semplici la creazione automatica dei contesti è utile: infatti la maggior parte degli esempi nei manuali LilyPond sfruttano questa semplificazione. Ma talvolta la creazione silenziosa di contesti può causare nuovi righi o partiture non desiderate. Ad esempio, si potrebbe pensare che il seguente codice colori di rosso tutte le teste delle note nel rigo, ma in realtà produce due righi, di cui il più basso conserva il colore nero predefinito per le teste delle note.

```
\override Staff.NoteHead #'color = #red
\new Staff { a }
```



Questo accade perché non esiste un contesto **Staff** quando viene elaborata l'istruzione di **override**, quindi ne viene implicitamente creato uno e l'override viene applicato ad esso. Ma poi il comando `\new Staff` crea un altro rigo separato nel quale vengono inserite le note. Il codice corretto per colorare le teste di tutte le note è

```
\new Staff {
  \override Staff.NoteHead #'color = #red
  a
}
```



Vediamo un secondo esempio. Se un comando `\relative` viene posto dentro un comando `\repeat`, vengono generati due rigi, il secondo spostato orizzontalmente rispetto al primo, perché il comando `\repeat` genera due blocchi `\relative`, ognuno dei quali crea implicitamente i blocchi **Staff** e **Voice**.

```
\repeat unfold 2 {
  \relative c' { c4 d e f }
}
```



Per correggere il problema basta istanziare esplicitamente il contesto **Voice**:

```
\new Voice {
  \repeat unfold 2 {
    \relative c' { c4 d e f }
  }
}
```



Errore apparente in `../ly/init.ly`

Vari oscuri messaggi di errore relativi a errori di sintassi in `../ly/init.ly` possono apparire se il file di input non ha una forma corretta, ad esempio se contiene delle parentesi o delle virgolette che non sono chiuse correttamente.

L'errore più comune è la mancanza di una parentesi graffa, `(}`, alla fine di un blocco **score**. In questo caso la soluzione è ovvia: controlla che il blocco **score** sia chiuso correttamente. La struttura corretta di un file di input è descritta in [Sezione “Come funzionano i file di input di](#)

LilyPond” in *Manuale di Apprendimento*. Per evitare questi errori conviene usare un editor che evidenzi automaticamente le parentesi e le graffe corrispondenti.

Una seconda causa frequente di errore è la mancanza di uno spazio tra l’ultima sillaba di un blocco di testo (lyrics) e la parentesi graffa che chiude il blocco, (}). Senza questa separazione si considera che la graffa faccia parte della sillaba. Si consiglia di assicurarsi sempre che ci sia uno spazio prima e dopo *ogni* parentesi graffa. Per comprendere l’importanza di questo quando si usa il testo, si veda *Sezione “Entering lyrics” in Guida alla Notazione*.

Questo messaggio di errore può apparire anche nel caso in cui sia omessa la virgoletta che chiude, ("). In questo caso il messaggio di errore dovrebbe dare un numero di riga vicino alla riga sbagliata. La virgoletta non chiusa sarà solitamente una o due righe sopra.

Messaggio di errore Unbound variable %

Questo messaggio di errore comparirà in fondo alla console di output o nel file di log insieme al messaggio “GUILE signalled an error ...” ogni volta che viene chiamata una routine di Scheme che contenga (erroneamente) un commento *LilyPond* invece di un commento *Scheme*.

I commenti LilyPond iniziano con un segno di percentuale, (%), e non devono essere usati all’interno delle routine di Scheme. I commenti Scheme iniziano con un punto e virgola, (;).

Messaggio di errore FT_Get_Glyph_Name

Questo messaggio di errore compare nella console di output o nel file di log file se un file di input contiene un carattere non-ASCII e non è stato salvato nella codifica UTF-8. Per dettagli si veda *Sezione “Text encoding” in Guida alla Notazione*.

Avvertimento sul fatto che le affinità del rigo devono solo diminuire

Questo avvertimento può apparire se non ci sono dei righi nell’output, ad esempio se ci sono solo un contesto **ChordName** e un contesto **Lyrics**, come in un lead sheet. Si possono evitare questi messaggi di avvertimento facendo in modo che uno dei contesti si comporti come un rigo inserendo

```
\override VerticalAxisGroup #'staff-affinity = ##f
```

all’inizio del contesto. Per dettagli si veda “Spacing of non-staff lines” in *Sezione “Flexible vertical spacing within systems” in Guida alla Notazione*.

2 Aggiornare i file con `convert-ly`

La sintassi di input di LilyPond viene regolarmente modificata per semplificarla o per migliorarla in vari modi. L'effetto collaterale è che l'interprete di LilyPond spesso non è più compatibile con i vecchi file di input. Per ovviare a questo problema, si può usare il programma `convert-ly`, che permette di gestire gran parte dei cambiamenti di sintassi tra le versioni di LilyPond.

2.1 Perché la sintassi cambia?

La sintassi di input di LilyPond talvolta cambia. Via via che LilyPond migliora, la sintassi (il linguaggio dell'input) viene modificata di conseguenza. Queste modifiche vengono fatte a volte per far sì che l'input sia più facile da leggere e da scrivere e a volte per fornire nuove funzionalità di LilyPond.

Ad esempio, tutti i nomi delle proprietà di `\paper` e `\layout` dovrebbero essere scritte nella forma **primo-secondo-terzo**. Tuttavia, nella versione 2.11.60 ci siamo accorti che la proprietà `printallheaders` non seguiva questa convenzione. Dovevamo lasciarla così come era (confondendo i nuovi utenti che devono avere a che fare con un formato di input incoerente), o cambiarla (disturbando i vecchi utenti che avevano già delle partiture)? In questo caso decidemmo di cambiare il nome in `print-all-headers`. Fortunatamente, questa modifica può essere automatizzata con `convert-ly`.

Purtroppo `convert-ly` non è in grado di gestire tutti i cambiamenti dell'input. Ad esempio, in LilyPond 2.4 e precedenti, gli accenti e le lettere non inglesi venivano inserite con LaTeX – per mostrare la parola francese per Natale si usava `No\`e1`. Ma in LilyPond 2.6 e superiori, il carattere speciale `è` deve essere inserito direttamente nel file LilyPond come carattere UTF-8. `convert-ly` non può sostituire tutti i caratteri speciali di LaTeX con i rispettivi caratteri UTF-8; è necessario aggiornare a mano i vecchi file di input di LilyPond.

2.2 Invocare `convert-ly`

`convert-ly` usa la dichiarazione `\version` nel file di input per determinare il vecchio numero di versione. Nella maggior parte dei casi per aggiornare il file di input è sufficiente eseguire

```
convert-ly -e miofile.ly
```

nella directory che contiene il file. Questo comando aggiornerà `'miofile.ly'` e preserverà il file originale in `'miofile.ly~'`.

Nota: `convert-ly` converte sempre fino all'ultimo cambiamento di sintassi da lui gestito. Questo significa che il numero di `\version` che appare nel file convertito è di solito inferiore al numero di versione di `convert-ly`.

Per convertire in una volta sola tutti i file di input in una directory si usa

```
convert-ly -e *.ly
```

Altrimenti, se si desidera specificare un nome diverso per il file aggiornato, lasciando non modificati il file originale e il suo nome, si usa

```
convert-ly miofile.ly > mionuovofile.ly
```

Il programma elencherà i numeri di versione per i quali sono state fatte le conversioni. Se non vengono elencati dei numeri di versione il file è già aggiornato.

Gli utenti MacOS X possono eseguire questi comandi dalla voce di menu **Compila > Aggiorna la sintassi**.

Gli utenti Windows devono inserire questi comandi nella finestra del Prompt dei comandi, che di solito si trova in **Start > Accessori > Prompt dei comandi**.

2.3 Opzioni da linea di comando per `convert-ly`

Il programma viene lanciato in questo modo:

```
convert-ly [opzione]... nomefile...
```

Esistono le seguenti opzioni:

`-e, --edit`

Applica le conversioni direttamente nel file di input, sostituendo l'originale.

`-f, --from=from-patchlevel`

Imposta la versione da cui convertire. Se non viene impostata, `convert-ly` la indovinerà in base alla stringa `\version` presente nel file. Esempio: `--from=2.10.25`

`-n, --no-version`

Normalmente `convert-ly` aggiunge un indicatore `\version` nell'output. Questa opzione lo impedisce.

`-s, --show-rules`

Mostra tutte le conversioni conosciute ed esce.

`--to=to-patchlevel`

Imposta l'obiettivo di versione della conversione. L'impostazione predefinita è l'ultima versione disponibile. Esempio: `--to=2.12.2`

`-h, --help`

Stampa l'aiuto per l'utilizzo.

Per aggiornare i frammenti LilyPond presenti nei file texinfo, si usa

```
convert-ly --from=... --to=... --no-version *.itely
```

Per vedere i cambiamenti della sintassi di LilyPond tra due versioni, si usa

```
convert-ly --from=... --to=... -s
```

2.4 Problemi nell'eseguire `convert-ly`

Quando si esegue `convert-ly` in una finestra del Prompt dei comandi in Windows su un file il cui nome o percorso contengano degli spazi, è necessario circondare interamente il nome del file di input con tre (!) doppie virgolette:

```
convert-ly ""D:/Mie Partiture/Ode.ly"" > "D:/Mie Partiture/new Ode.ly"
```

Se il semplice comando `convert-ly -e *.ly` non funziona perché la linea di comando espansa diventa troppo lunga, si può inserire il comando `convert-ly` in un loop. Questo esempio per UNIX aggiornerà tutti i file `.ly` nella directory corrente

```
for f in *.ly; do convert-ly -e $f; done;
```

Nella finestra del Prompt dei comandi di Windows il comando corrispondente è

```
for %x in (*.ly) do convert-ly -e ""%x""
```

Non vengono gestite tutti i cambiamenti del linguaggio. Si può specificare solo un'opzione di output. È piuttosto improbabile che si aggiornino automaticamente il codice scheme e le interfacce di scheme di LilyPond; tieniti pronto a correggere a mano il codice scheme.

2.5 Conversioni manuali

In teoria, un programma come `convert-ly` potrebbe gestire qualsiasi cambiamento di sintassi. Dopo tutto, un programma per computer interpreta la vecchia versione e la nuova versione, quindi un altro programma può tradurre un file in un altro¹.

¹ O almeno questo è possibile in qualsiasi file LilyPond che non contenga codice scheme. Se c'è del codice scheme nel file, allora il file LilyPond contiene un linguaggio Turing-completo, ed è possibile imbattersi in problemi col famoso "Problema dell'arresto" in informatica.

Tuttavia il progetto LilyPond ha risorse limitate: non tutte le conversioni sono compiute automaticamente. Qui sotto si trova una lista dei problemi noti.

1.6->2.0:

Doesn't always convert figured bass correctly, specifically things like {<>}. Mats' comment on working around this:

To be able to run `convert-ly`

on it, I first replaced all occurrences of '{<' to some dummy like '{#' and similarly I replaced '>}' with '&}'. After the conversion, I could then change back from '{ #' to '{ <' and from '& }' to '> }'.

Doesn't convert all text markup correctly. In the old markup syntax, it was possible to group a number of markup commands together within parentheses, e.g.

```
-#((bold italic) "string")
```

This will incorrectly be converted into

```
-\markup{{\bold italic} "string"}
```

instead of the correct

```
-\markup{\bold \italic "string"}
```

2.0->2.2:

Doesn't handle `\partcombine`

Doesn't do `\addlyrics => \lyricsto`, this breaks some scores with multiple stanzas.

2.0->2.4:

`\magnify` isn't changed to `\fontsize`.

```
- \magnify #m => \fontsize #f, where f = 6ln(m)/ln(2)
```

`remove-tag` isn't changed.

```
- \applyMusic #(remove-tag '. . .) => \keepWithTag #' . . .
```

`first-page-number` isn't changed.

```
- first-page-number no => print-first-page-number = ##f
```

Line breaks in header strings aren't converted.

```
- \\\\ as line break in \header strings => \markup \center-align <
  "First Line" "Second Line" >
```

Crescendo and decrescendo terminators aren't converted.

```
- \rced => \!
```

```
- \rc => \!
```

2.2->2.4:

`\turnOff` (used in `\set Staff.VoltaBracket = \turnOff`) is not properly converted.

2.4.2->2.5.9

`\markup{ \center-align <{ ... }> }` should be converted to:

```
\markup{ \center-align {\line { ... }} }
```

but now, `\line` is missing.

2.4->2.6

Special LaTeX characters such as $\$~\$$ in text are not converted to UTF8.

2.8

`\score{}` must now begin with a music expression. Anything else (particularly `\header{}`) must come after the music.

3 Running lilypond-book

If you want to add pictures of music to a document, you can simply do it the way you would do with other types of pictures. The pictures are created separately, yielding PostScript output or PNG images, and those are included into a L^AT_EX or HTML document.

`lilypond-book` provides a way to automate this process: This program extracts snippets of music from your document, runs `lilypond` on them, and outputs the document with pictures substituted for the music. The line width and font size definitions for the music are adjusted to match the layout of your document.

This is a separate program from `lilypond` itself, and is run on the command line; for more information, see [\[Command-line usage\]](#), pagina [\[undefined\]](#). If you have MacOS 10.3 or 10.4 and you have trouble running `lilypond-book`, see [Sezione “MacOS X” in Informazioni generali](#).

This procedure may be applied to L^AT_EX, HTML, Texinfo or DocBook documents.

3.1 An example of a musicological document

Some texts contain music examples. These texts are musicological treatises, songbooks, or manuals like this. Such texts can be made by hand, simply by importing a PostScript figure into the word processor. However, there is an automated procedure to reduce the amount of work involved in HTML, L^AT_EX, Texinfo and DocBook documents.

A script called `lilypond-book` will extract the music fragments, format them, and put back the resulting notation. Here we show a small example for use with L^AT_EX. The example also contains explanatory text, so we will not comment on it further.

Input

```
\documentclass[a4paper]{article}
```

```
\begin{document}
```

Documents for `\verb+lilypond-book+` may freely mix music and text.
For example,

```
\begin{lilypond}
\relative c' {
  c2 e2 \times 2/3 { f8 a b } a2 e4
}
\end{lilypond}
```

Options are put in brackets.

```
\begin{lilypond}[fragment,quote,staffsize=26,verbatim]
c'4 f16
\end{lilypond}
```

Larger examples can be put into a separate file, and introduced with
`\verb+\lilypondfile+`.

```
\lilypondfile[quote,noindent]{screech-boink.ly}
```

(If needed, replace `@file{screech-boink.ly}` by any `@file{.ly}` file

you put in the same directory as this file.)

```
\end{document}
```

Processing

Save the code above to a file called ‘lilybook.lytex’, then in a terminal run

```
lilypond-book --output=out --pdf lilybook.lytex
lilypond-book (GNU LilyPond) 2.13.58
```

```
Reading lilybook.lytex...
..lots of stuff deleted..
Compiling lilybook.tex...
cd out
pdflatex lilybook
..lots of stuff deleted..
xpdf lilybook
(replace xpdf by your favorite PDF viewer)
```

Running lilypond-book and latex creates a lot of temporary files, which would clutter up the working directory. To remedy this, use the `--output=dir` option. It will create the files in a separate subdirectory ‘dir’.

Finally the result of the L^AT_EX example shown above.¹ This finishes the tutorial section.

¹ This tutorial is processed with Texinfo, so the example gives slightly different results in layout.

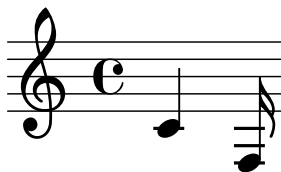
Output

Documents for lilypond-book may freely mix music and text. For example,

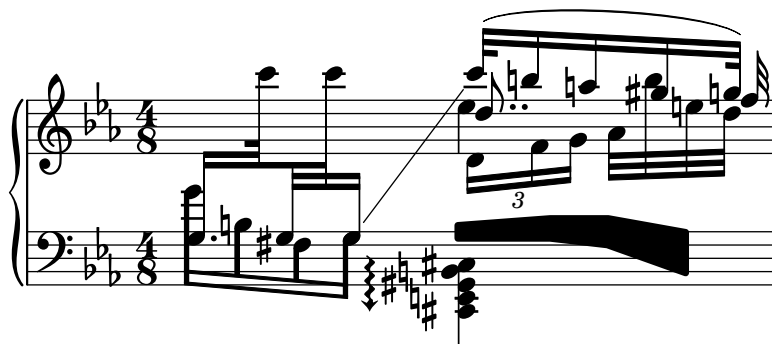


Options are put in brackets.

```
c'4 f16
```



Larger examples can be put into a separate file, and introduced with `\lilypondfile`.



If a tagline is required, either default or custom, then the entire snippet must be enclosed in a `\book { }` construct.

```
\book{
  \header{
    title = "A scale in LilyPond"
  }

  \relative c' {
    c d e f g a b c
  }
}
```

A scale in LilyPond



Music engraving by LilyPond 2.13.58—www.lilypond.org

3.2 Integrating music and text

Here we explain how to integrate LilyPond with various output formats.

3.2.1 $\text{\LaTeX}$

$\text{\LaTeX}$ is the de-facto standard for publishing layouts in the exact sciences. It is built on top of the $\text{\TeX}$ typesetting engine, providing the best typography available anywhere.

See *The Not So Short Introduction to $\text{\LaTeX}$* for an overview on how to use $\text{\LaTeX}$.

Music is entered using

```
\begin{lilypond}[options,go,here]
  YOUR LILYPOND CODE
\end{lilypond}
```

or

```
\lilypondfile[options,go,here]{filename}
```

or

```
\lilypond[options,go,here]{ YOUR LILYPOND CODE }
```

Additionally, `\lilypondversion` displays the current version of lilypond. Running `lilypond-book` yields a file that can be further processed with $\text{\LaTeX}$.

We show some examples here. The `lilypond` environment

```
\begin{lilypond}[quote,fragment,staffsize=26]
  c' d' e' f' g'2 g'2
\end{lilypond}
```

produces



The short version

```
\lilypond[quote,fragment,staffsize=11]{<c' e' g'>}
```

produces



Currently, you cannot include `{` or `}` within `\lilypond{}`, so this command is only useful with the `fragment` option.

The default line width of the music will be adjusted by examining the commands in the document preamble, the part of the document before `\begin{document}`. The `lilypond-book` command sends these to $\text{\LaTeX}$ to find out how wide the text is. The line width for the music fragments is then adjusted to the text width. Note that this heuristic algorithm can fail easily; in such cases it is necessary to use the `line-width` music fragment option.

Each snippet will call the following macros if they have been defined by the user:

- `\preLilyPondExample` called before the music,
- `\postLilyPondExample` called after the music,
- `\betweenLilyPondSystem[1]` is called between systems if `lilypond-book` has split the snippet into several PostScript files. It must be defined as taking one parameter and will be passed the number of files already included in this snippet. The default is to simply insert a `\linebreak`.

Frammenti di codice selezionati

Sometimes it is useful to display music elements (such as ties and slurs) as if they continued after the end of the fragment. This can be done by breaking the staff and suppressing inclusion of the rest of the LilyPond output.

In L^AT_EX, define `\betweenLilyPondSystem` in such a way that inclusion of other systems is terminated once the required number of systems are included. Since `\betweenLilyPondSystem` is first called *after* the first system, including only the first system is trivial.

```
\def\betweenLilyPondSystem#1{\endinput}
```

```
\begin{lilypond}[fragment]
  c'1\(\ e'( c'~ \break c' d) e f\
\end{lilypond}
```

If a greater number of systems is requested, a T_EX conditional must be used before the `\endinput`. In this example, replace ‘2’ by the number of systems you want in the output.

```
\def\betweenLilyPondSystem#1{
  \ifnum#1<2\else\expandafter\endinput\fi
}
```

(Since `\endinput` immediately stops the processing of the current input file we need `\expandafter` to delay the call of `\endinput` after executing `\fi` so that the `\if-\fi` clause is balanced.)

Remember that the definition of `\betweenLilyPondSystem` is effective until T_EX quits the current group (such as the L^AT_EX environment) or is overridden by another definition (which is, in most cases, for the rest of the document). To reset your definition, write

```
\let\betweenLilyPondSystem\undefined
```

in your L^AT_EX source.

This may be simplified by defining a T_EX macro

```
\def\onlyFirstNSystems#1{
  \def\betweenLilyPondSystem##1{%
    \ifnum##1<#1\else\expandafter\endinput\fi}
}
```

and then saying only how many systems you want before each fragment,

```
\onlyFirstNSystems{3}
\begin{lilypond}...\end{lilypond}
\onlyFirstNSystems{1}
\begin{lilypond}...\end{lilypond}
```

Vedi anche

There are specific `lilypond-book` command line options and other details to know when processing L^AT_EX documents, see [Sezione 3.4 \[Invoking lilypond-book\]](#), pagina 24.

3.2.2 Texinfo

Texinfo is the standard format for documentation of the GNU project. An example of a Texinfo document is this manual. The HTML, PDF, and Info versions of the manual are made from the Texinfo document.

In the input file, music is specified with

```
@lilypond[options,go,here]
  YOUR LILYPOND CODE
@end lilypond
```

or

```
@lilypond[options,go,here]{ YOUR LILYPOND CODE }
```

or

```
@lilypondfile[options,go,here]{filename}
```

Additionally, `@lilypondversion` displays the current version of lilypond.

When `lilypond-book` is run on it, this results in a Texinfo file (with extension `‘.texi’`) containing `@image` tags for HTML, Info and printed output. `lilypond-book` generates images of the music in EPS and PDF formats for use in the printed output, and in PNG format for use in HTML and Info output.

We show two simple examples here. A `lilypond` environment

```
@lilypond[fragment]
```

```
c' d' e' f' g'2 g'
```

```
@end lilypond
```

produces



The short version

```
@lilypond[fragment,staffsize=11]{<c' e' g'>}
```

produces



Contrary to $\text{\LaTeX}$, `@lilypond{...}` does not generate an in-line image. It always gets a paragraph of its own.

3.2.3 HTML

Music is entered using

```
<lilypond fragment relative=2>
```

```
\key c \minor c4 es g2
```

```
</lilypond>
```

`lilypond-book` then produces an HTML file with appropriate image tags for the music fragments:



For inline pictures, use `<lilypond ... />`, where the options are separated by a colon from the music, for example

Some music in `<lilypond relative=2: a b c/>` a line of text.

To include separate files, say

```
<lilypondfile option1 option2 ...>filename</lilypondfile>
```

For a list of options to use with the `lilypond` or `lilypondfile` tags, see [Sezione 3.3 \[Music fragment options\]](#), [pagina 21](#).

Additionally, `<lilypondversion/>` displays the current version of lilypond.

3.2.4 DocBook

For inserting LilyPond snippets it is good to keep the conformity of our DocBook document, thus allowing us to use DocBook editors, validation etc. So we don't use custom tags, only specify a convention based on the standard DocBook elements.

Common conventions

For inserting all type of snippets we use the `mediaobject` and `inlinemediaobject` element, so our snippets can be formatted inline or not inline. The snippet formatting options are always provided in the `role` property of the innermost element (see in next sections). Tags are chosen to allow DocBook editors format the content gracefully. The DocBook files to be processed with `lilypond-book` should have the extension `'.lyxml'`.

Including a LilyPond file

This is the most simple case. We must use the `'.ly'` extension for the included file, and insert it as a standard `imageobject`, with the following structure:

```
<mediaobject>
  <imageobject>
    <imagedata fileref="music1.ly" role="printfilename" />
  </imageobject>
</mediaobject>
```

Note that you can use `mediaobject` or `inlinemediaobject` as the outermost element as you wish.

Including LilyPond code

Including LilyPond code is possible by using a `programlisting`, where the language is set to `lilypond` with the following structure:

```
<inlinemediaobject>
  <textobject>
    <programlisting language="lilypond" role="fragment verbatim staffsize=16 ragged-right r
\context Staff \with {
  \remove Time_signature_engraver
  \remove Clef_engraver}
{ c4( fis) }
    </programlisting>
  </textobject>
</inlinemediaobject>
```

As you can see, the outermost element is a `mediaobject` or `inlinemediaobject`, and there is a `textobject` containing the `programlisting` inside.

Processing the DocBook document

Running `lilypond-book` on our `'.lyxml'` file will create a valid DocBook document to be further processed with `'.xml'` extension. If you use `dblatex`, it will create a PDF file from this document automatically. For HTML (HTML Help, JavaHelp etc.) generation you can use the official DocBook XSL stylesheets, however, it is possible that you have to make some customization for it.

3.3 Music fragment options

In the following, a 'LilyPond command' refers to any command described in the previous sections which is handled by `lilypond-book` to produce a music snippet. For simplicity, LilyPond commands are only shown in $\text{\LaTeX}$ syntax.

Note that the option string is parsed from left to right; if an option occurs multiple times, the last one is taken.

The following options are available for LilyPond commands:

staffsize=ht

Set staff size to *ht*, which is measured in points.

ragged-right

Produce ragged-right lines with natural spacing, i.e., **ragged-right = ##t** is added to the LilyPond snippet. This is the default for the `\lilypond{}` command if no **line-width** option is present. It is also the default for the `lilypond` environment if the **fragment** option is set, and no line width is explicitly specified.

noragged-right

For single-line snippets, allow the staff length to be stretched to equal that of the line width, i.e., **ragged-right = ##f** is added to the LilyPond snippet.

line-width

line-width=size\unit

Set line width to *size*, using *unit* as units. *unit* is one of the following strings: **cm**, **mm**, **in**, or **pt**. This option affects LilyPond output (this is, the staff length of the music snippet), not the text layout.

If used without an argument, set line width to a default value (as computed with a heuristic algorithm).

If no **line-width** option is given, `lilypond-book` tries to guess a default for `lilypond` environments which don't use the **ragged-right** option.

papersize=string

Where *string* is a paper size defined in '`scm/paper.scm`' i.e. **a5**, **quarto**, **11x17** etc.

Values not defined in '`scm/paper.scm`' will be ignored, a warning will be posted and the snippet will be printed using the default **a4** size.

notime

Do not print the time signature, and turns off the timing (time signature, bar lines) in the score.

fragment

Make `lilypond-book` add some boilerplate code so that you can simply enter, say, `c'4` without `\layout`, `\score`, etc.

nofragment

Do not add additional code to complete LilyPond code in music snippets. Since this is the default, **nofragment** is redundant normally.

indent=size\unit

Set indentation of the first music system to *size*, using *unit* as units. *unit* is one of the following strings: **cm**, **mm**, **in**, or **pt**. This option affects LilyPond, not the text layout.

noindent

Set indentation of the first music system to zero. This option affects LilyPond, not the text layout. Since no indentation is the default, **noindent** is redundant normally.

quote

Reduce line length of a music snippet by 2*0.4in and put the output into a quotation block. The value '0.4in' can be controlled with the **exampleindent** option.

exampleindent

Set the amount by which the **quote** option indents a music snippet.

relative
relative=n

Use relative octave mode. By default, notes are specified relative to middle C. The optional integer argument specifies the octave of the starting note, where the default 1 is middle C. **relative** option only works when **fragment** option is set, so **fragment** is automatically implied by **relative**, regardless of the presence of any (no)**fragment** option in the source.

LilyPond also uses **lilypond-book** to produce its own documentation. To do that, some more obscure music fragment options are available.

verbatim The argument of a LilyPond command is copied to the output file and enclosed in a verbatim block, followed by any text given with the **intertext** option (not implemented yet); then the actual music is displayed. This option does not work well with `\lilypond{}` if it is part of a paragraph.

If **verbatim** is used in a **lilypondfile** command, it is possible to enclose verbatim only a part of the source file. If the source file contain a comment containing ‘**begin verbatim**’ (without quotes), quoting the source in the verbatim block will start after the last occurrence of such a comment; similarly, quoting the source verbatim will stop just before the first occurrence of a comment containing ‘**end verbatim**’, if there is any. In the following source file example, the music will be interpreted in relative mode, but the verbatim quote will not show the **relative** block, i.e.

```
\relative c' { % begin verbatim
  c4 e2 g4
  f2 e % end verbatim
}
```

will be printed with a verbatim block like

```
c4 e2 g4
f2 e
```

If you would like to translate comments and variable names in verbatim output but not in the sources, you may set the environment variable `LYDOC_LOCALEDIR` to a directory path; the directory should contain a tree of ‘.mo’ message catalogs with **lilypond-doc** as a domain.

addversion

(Only for Texinfo output.) Prepend line `\version @w{"@version{}}"` to verbatim output.

texidoc (Only for Texinfo output.) If **lilypond** is called with the ‘**--header=texidoc**’ option, and the file to be processed is called ‘foo.ly’, it creates a file ‘foo.texidoc’ if there is a **texidoc** field in the `\header`. The **texidoc** option makes **lilypond-book** include such files, adding its contents as a documentation block right before the music snippet.

Assuming the file ‘foo.ly’ contains

```
\header {
  texidoc = "This file demonstrates a single note."
}
{ c'4 }
```

and we have this in our Texinfo document ‘test.texinfo’

```
@lilypondfile[texidoc]{foo.ly}
```

the following command line gives the expected result

```
lilypond-book --pdf --process="lilypond \
  -dbackend=eps --header=texidoc" test.texinfo
```

Most LilyPond test documents (in the ‘input’ directory of the distribution) are small ‘.ly’ files which look exactly like this.

For localization purpose, if the Texinfo document contains `@documentlanguage LANG` and ‘foo.ly’ header contains a `texidocLANG` field, and if lilypond is called with ‘`--header=texidocLANG`’, then ‘foo.texidocLANG’ will be included instead of ‘foo.texidoc’.

lilyquote

(Only for Texinfo output.) This option is similar to `quote`, but only the music snippet (and the optional verbatim block implied by `verbatim` option) is put into a quotation block. This option is useful if you want to `quote` the music snippet but not the `texidoc` documentation block.

doctitle (Only for Texinfo output.) This option works similarly to `texidoc` option: if lilypond is called with the ‘`--header=doctitle`’ option, and the file to be processed is called ‘foo.ly’ and contains a `doctitle` field in the `\header`, it creates a file ‘foo.doctitle’. When `doctitle` option is used, the contents of ‘foo.doctitle’, which should be a single line of *text*, is inserted in the Texinfo document as `@lydoctitle text`. `@lydoctitle` should be a macro defined in the Texinfo document. The same remark about `texidoc` processing with localized languages also applies to `doctitle`.

nogettext

(Only for Texinfo output.) Do not translate comments and variable names in the snippet quoted verbatim.

printfilename

If a LilyPond input file is included with `\lilypondfile`, print the file name right before the music snippet. For HTML output, this is a link. Only the base name of the file is printed, i.e. the directory part of the file path is stripped.

3.4 Invoking lilypond-book

`lilypond-book` produces a file with one of the following extensions: ‘.tex’, ‘.texi’, ‘.html’ or ‘.xml’, depending on the output format. All of ‘.tex’, ‘.texi’ and ‘.xml’ files need further processing.

Format-specific instructions

L^AT_EX

There are two ways of processing your L^AT_EX document for printing or publishing: getting a PDF file directly with PDFL^AT_EX, or getting a PostScript file with L^AT_EX via a DVI to PostScript translator like `dvips`. The first way is simpler and recommended¹, and whichever way you use, you can easily convert between PostScript and PDF with tools, like `ps2pdf` and `pdf2ps` included in Ghostscript package.

To produce a PDF file through PDFL^AT_EX, use

```
lilypond-book --pdf yourfile.lytex
pdflatex yourfile.tex
```

To produce PDF output via L^AT_EX/`dvips`/`ps2pdf`, you should do

¹ Note that PDFL^AT_EX and L^AT_EX may not be both usable to compile any L^AT_EX document, that is why we explain the two ways.

```
lilypond-book yourfile.lytex
latex yourfile.tex
dvips -Ppdf yourfile.dvi
ps2pdf yourfile.ps
```

The ‘.dvi’ file created by this process will not contain note heads. This is normal; if you follow the instructions, they will be included in the ‘.ps’ and ‘.pdf’ files.

Running `dvips` may produce some warnings about fonts; these are harmless and may be ignored. If you are running `latex` in twocolumn mode, remember to add `-t landscape` to the `dvips` options.

Texinfo

To produce a Texinfo document (in any output format), follow the normal procedures for Texinfo; this is, either call `texi2pdf` or `texi2dvi` or `makeinfo`, depending on the output format you want to create. See the documentation of Texinfo for further details.

Command line options

`lilypond-book` accepts the following command line options:

`-f format`

`--format=format`

Specify the document type to process: `html`, `latex`, `texi` (the default) or `docbook`. If this option is missing, `lilypond-book` tries to detect the format automatically, see [Sezione 3.5 \[Filename extensions\]](#), [pagina 26](#). Currently, `texi` is the same as `texi-html`.

`-F filter`

`--filter=filter`

Pipe snippets through *filter*. `lilypond-book` will not `-filter` and `-process` at the same time. For example,

```
lilypond-book --filter='convert-ly --from=2.0.0 -' my-book.tely
```

`-h`

`--help` Print a short help message.

`-I dir`

`--include=dir`

Add *dir* to the include path. `lilypond-book` also looks for already compiled snippets in the include path, and does not write them back to the output directory, so in some cases it is necessary to invoke further processing commands such as `makeinfo` or `latex` with the same `-I dir` options.

`-o dir`

`--output=dir`

Place generated files in directory *dir*. Running `lilypond-book` generates lots of small files that LilyPond will process. To avoid all that garbage in the source directory, use the ‘`--output`’ command line option, and change to that directory before running `latex` or `makeinfo`.

```
lilypond-book --output=out yourfile.lytex
cd out
```

```

...
--skip-lily-check
    Do not fail if no lilypond output is found. It is used for LilyPond Info documentation
    without images.
--skip-png-check
    Do not fail if no PNG images are found for EPS files. It is used for LilyPond Info
    documentation without images.
--lily-output-dir=dir
    Write lily-XXX files to directory dir, link into --output directory. Use this option
    to save building time for documents in different directories which share a lot of
    identical snippets.
--info-images-dir=dir
    Format Texinfo output so that Info will look for images of music in dir.
--latex-program=prog
    Run executable prog instead of latex. This is useful if your document is processed
    with xelatex, for example.
--left-padding=amount
    Pad EPS boxes by this much. amount is measured in millimeters, and is 3.0 by
    default. This option should be used if the lines of music stick out of the right margin.
    The width of a tightly clipped system can vary, due to notation elements that stick
    into the left margin, such as bar numbers and instrument names. This option will
    shorten each line and move each line to the right by the same amount.
-P command
--process=command
    Process LilyPond snippets using command. The default command is lilypond.
    lilypond-book will not --filter and --process at the same time.
--pdf
    Create PDF files for use with PDF $\LaTeX$ .
--use-source-file-names
    Write snippet output files with the same base name as their source file. This option
    works only for snippets included with lilypondfile and only if directories implied
    by --output-dir and --lily-output-dir options are different.
-V
--verbose
    Be verbose.
-v
--version
    Print version information.

```

Problemi noti e avvertimenti

The Texinfo command `@pagesizes` is not interpreted. Similarly, $\LaTeX$ commands that change margins and line widths after the preamble are ignored.

Only the first `\score` of a LilyPond block is processed.

3.5 Filename extensions

You can use any filename extension for the input file, but if you do not use the recommended extension for a particular format you may need to manually specify the output format; for details, see [Sezione 3.4 \[Invoking lilypond-book\]](#), [pagina 24](#). Otherwise, *lilypond-book* automatically selects the output format based on the input filename's extension.

extension	output format
<code>‘.html’</code>	HTML
<code>‘.htmly’</code>	HTML
<code>‘.itely’</code>	Texinfo
<code>‘.latex’</code>	L ^A T _E X
<code>‘.lytex’</code>	L ^A T _E X
<code>‘.lyxml’</code>	DocBook
<code>‘.tely’</code>	Texinfo
<code>‘.tex’</code>	L ^A T _E X
<code>‘.texi’</code>	Texinfo
<code>‘.texinfo’</code>	Texinfo
<code>‘.xml’</code>	HTML

If you use the same filename extension for the input file than the extension `lilypond-book` uses for the output file, and if the input file is in the same directory as `lilypond-book` working directory, you must use `--output` option to make `lilypond-book` running, otherwise it will exit with an error message like “Output would overwrite input file”.

3.6 lilypond-book templates

These templates are for use with `lilypond-book`. If you’re not familiar with this program, please refer to [Capitolo 3 \[lilypond-book\], pagina 14](#).

3.6.1 LaTeX

You can include LilyPond fragments in a LaTeX document.

```
\documentclass[]{article}
```

```
\begin{document}
```

Normal LaTeX text.

```
\begin{lilypond}
```

```
\relative c'' {
```

```
  a4 b c d
```

```
}
```

```
\end{lilypond}
```

More LaTeX text, and options in square brackets.

```
\begin{lilypond}[fragment,relative=2,quote,staffsize=26,verbatim]
```

```
d4 c b a
```

```
\end{lilypond}
```

```
\end{document}
```

3.6.2 Texinfo

You can include LilyPond fragments in Texinfo; in fact, this entire manual is written in Texinfo.

```
\input texinfo @node Top
```

```
@top
```

Texinfo text

```
@lilypond
```

```
\relative c' {
  a4 b c d
}
@end lilypond
```

More Texinfo text, and options in brackets.

```
@lilypond[verbatim,fragment,ragged-right]
d4 c b a
@end lilypond
```

```
@bye
```

3.6.3 html

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<!-- header_tag -->
<HTML>
<body>

<p>
Documents for lilypond-book may freely mix music and text.  For
example,
<lilypond>
\relative c' {
  a4 b c d
}
</lilypond>
</p>

<p>
Another bit of lilypond, this time with options:

<lilypond fragment quote staffsize=26 verbatim>
a4 b c d
</lilypond>
</p>

</body>
</html>
```

3.6.4 xelatex

```
\documentclass{article}
\usepackage{ifxetex}
\ifxetex
%xetex specific stuff
\usepackage{xunicode,fontspec,xltxtra}
\setmainfont[Numbers=OldStyle]{Times New Roman}
\setsansfont{Arial}
\else
```

```
%This can be empty if you are not going to use pdftex
\usepackage[T1]{fontenc}
\usepackage[utf8]{inputenc}
\usepackage{mathptmx}%Times
\usepackage{helvet}%Helvetica
\fi
%Here you can insert all packages that pdftex also understands
\usepackage[ngerman,finnish,english]{babel}
\usepackage{graphicx}

\begin{document}
\title{A short document with LilyPond and xelatex}
\maketitle
```

Normal `\textbf{font}` commands inside the `\emph{text}` work, because they `\textsf{are}` supported by `\LaTeX{}` and `Xetex{}`. If you want to use specific commands like `\verb+\XeTeX+`, you should include them again in a `\verb+\ifxetex+` environment. You can use this to print the `\ifxetex \XeTeX{}` command `\else XeTeX command \fi` which is not known to normal `\LaTeX`.

In normal text you can easily use LilyPond commands, like this:

```
\begin{lilypond}
{a2 b c'8 c' c' c'}
\end{lilypond}

\noindent
and so on.
```

The fonts of snippets set with LilyPond will have to be set from inside of the snippet. For this you should read the AU on how to use lilypond-book.

```
\selectlanguage{ngerman}
Auch Umlaute funktionieren ohne die \LaTeX -Befehle, wie auch alle
anderen
seltsamen Zeichen: __ _____, wenn sie von der Schriftart
unterst__tzt werden.
\end{document}
```

3.7 Sharing the table of contents

These functions already exist in the `Orchestrallily` package:

<http://repo.or.cz/w/orchestrallily.git>

For greater flexibility in text handling, some users prefer to export the table of contents from lilypond and read it into `LATEX`.

Exporting the ToC from LilyPond

This assumes that your score has multiple movements in the same lilypond output file.

```
\define (oly:create-toc-file layout pages)
```

```

(let* ((label-table (ly:output-def-lookup layout 'label-page-table)))
  (if (not (null? label-table))
    (let* ((format-line (lambda (toc-item)
      (let* ((label (car toc-item))
        (text (caddr toc-item))
        (label-page (and (list? label-table)
          (assoc label label-table)))
        (page (and label-page (cdr label-page))))
      (format #f "~a, section, 1, {~a}, ~a" page text label))))
      (formatted-toc-items (map format-line (toc-items)))
      (whole-string (string-join formatted-toc-items ",\n"))
      (output-name (ly:parser-output-name parser))
      (outfile-name (format "~a.toc" output-name))
      (outfile (open-output-file outfile-name)))
    (if (output-port? outfile)
      (display whole-string outfile)
      (ly:warning (_ "Unable to open output file ~a for the TOC information") outfile-name))
    (close-output-port outfile))))))

\paper {
  #define (page-post-process layout pages) (oly:create-toc-file layout pages))
}

```

Importing the ToC into LaTeX

In LaTeX, the header should include:

```

\usepackage{pdfpages}
\includescore{nameofthescore}

```

where `\includescore` is defined as:

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% \includescore{PossibleExtension}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Read in the TOC entries for a PDF file from the corresponding .toc file.
% This requires some heave latex tweaking, since reading in things from a file
% and inserting it into the arguments of a macro is not (easily) possible

% Solution by Patrick Fimml on #latex on April 18, 2009:
% \readfile{filename}{\variable}
% reads in the contents of the file into \variable (undefined if file
% doesn't exist)
\newread\readfile@f
\def\readfile@line#1{%
{\catcode\~M=10\global\read\readfile@f to \readfile@tmp}%
\edef\do{\noexpand\g@addto@macro{\noexpand#1}{\readfile@tmp}}\do%
\ifeof\readfile@f\else%
\readfile@line{#1}%
\fi%
}
\def\readfile#1#2{%
\openin\readfile@f=#1 %
\ifeof\readfile@f%
\typeout{No TOC file #1 available!}%
\else%
\gdef#2{%
\readfile@line{#2}%
\fi
\closein\readfile@f%
}%

\newcommand{\includescore}[1]{
\def\oly@fname{\oly@basename\@ifmtarg{#1}{_}{_#1}}
\let\oly@addtotoc\undefined

```

```
\readfile{\oly@xxxxxxxx}{\oly@addtotoc}
\ifx\oly@addtotoc\undefined
\includepdf[pages=-]{\oly@fname}
\else
\edef\includeit{\noexpand\includepdf[pages=-,addtotoc={\oly@addtotoc}]
{\oly@fname}}\includeit
\fi
}
```

3.8 Alternative methods of mixing text and music

Other means of mixing text and music (without lilypond-book) are discussed in [Sezione 4.4 \[LilyPond output in other programs\]](#), pagina 37.

4 External programs

LilyPond can interact with other programs in various ways.

4.1 Point and click

Point and click lets you find notes in the input by clicking on them in the PDF viewer. This makes it easier to find input that causes some error in the sheet music.

When this functionality is active, LilyPond adds hyperlinks to the PDF file. These hyperlinks are sent to the web-browser, which opens a text-editor with the cursor in the right place.

To make this chain work, you should configure your PDF viewer to follow hyperlinks using the ‘`lilypond-invoke-editor`’ script supplied with LilyPond.

For Xpdf on UNIX, the following should be present in ‘`xpdfrc`’¹

```
urlCommand      "lilypond-invoke-editor %s"
```

The program ‘`lilypond-invoke-editor`’ is a small helper program. It will invoke an editor for the special `textedit` URIs, and run a web browser for others. It tests the environment variable `EDITOR` for the following patterns,

```
emacs      this will invoke
            emacsclient --no-wait +line:column file

gvim       this will invoke
            gvim --remote +:line:nomcolumn file

nedit      this will invoke
            nc -noask +line file'
```

The environment variable `LYEDITOR` is used to override this. It contains the command line to start the editor, where `%(file)s`, `%(column)s`, `%(line)s` is replaced with the file, column and line respectively. The setting

```
emacsclient --no-wait +%(line)s:%(column)s %(file)s
```

for `LYEDITOR` is equivalent to the standard `emacsclient` invocation.

The point and click links enlarge the output files significantly. For reducing the size of PDF and PS files, point and click may be switched off by issuing

```
\pointAndClickOff
```

in a ‘`.ly`’ file. Point and click may be explicitly enabled with

```
\pointAndClickOn
```

Alternately, you may disable point and click with a command-line option:

```
lilypond -dno-point-and-click file.ly
```

Nota: You should always turn off point and click in any LilyPond files to be distributed to avoid including path information about your computer in the .pdf file, which can pose a security risk.

¹ On UNIX, this file is found either in ‘`/etc/xpdfrc`’ or as ‘`.xpdfrc`’ in your home directory.

4.2 Text editor support

There is support for different text editors for LilyPond.

Emacs mode

Emacs has a ‘`lilypond-mode`’, which provides keyword autocompletion, indentation, LilyPond specific parenthesis matching and syntax coloring, handy compile short-cuts and reading LilyPond manuals using Info. If ‘`lilypond-mode`’ is not installed on your platform, see below.

An Emacs mode for entering music and running LilyPond is contained in the source archive in the ‘`elisp`’ directory. Do `make install` to install it to `elispdir`. The file ‘`lilypond-init.el`’ should be placed to `load-path/site-start.d/` or appended to your ‘`~/.emacs`’ or ‘`~/.emacs.el`’.

As a user, you may want add your source path (e.g. ‘`~/site-lisp/`’) to your `load-path` by appending the following line (as modified) to your ‘`~/.emacs`’

```
(setq load-path (append (list (expand-file-name "~/site-lisp")) load-path))
```

Vim mode

For **Vim**, a filetype plugin, indent mode, and syntax-highlighting mode are available to use with LilyPond. To enable all of these features, create (or modify) your ‘`$HOME/.vimrc`’ to contain these three lines, in order:

```
filetype off
set runtimepath+="/usr/local/share/lilypond/current/vim/"
filetype on
```

If LilyPond is not installed in the ‘`/usr/local/`’ directory, change the path appropriately. This topic is discussed in [Sezione “Other sources of information” in *Manuale di Apprendimento*](#).

Other editors

Other editors (both text and graphical) support LilyPond, but their special configuration files are not distributed with LilyPond. Consult their documentation for more information. Such editors are listed in [Sezione “Easier editing” in *Informazioni generali*](#).

4.3 Converting from other formats

Music can be entered also by importing it from other formats. This chapter documents the tools included in the distribution to do so. There are other tools that produce LilyPond input, for example GUI sequencers and XML converters. Refer to the [website](#) for more details.

These are separate programs from `lilypond` itself, and are run on the command line; see [\[Command-line usage\]](#), [pagina \[undefined\]](#) for more information. If you have MacOS 10.3 or 10.4 and you have trouble running some of these scripts, e.g. `convert-ly`, see [Sezione “MacOS X” in *Informazioni generali*](#).

Problemi noti e avvertimenti

We unfortunately do not have the resources to maintain these programs; please consider them “as-is”. Patches are appreciated, but bug reports will almost certainly not be resolved.

4.3.1 Invoking `midi2ly`

`midi2ly` translates a Type 1 MIDI file to a LilyPond source file.

MIDI (Music Instrument Digital Interface) is a standard for digital instruments: it specifies cabling, a serial protocol and a file format. The MIDI file format is a de facto standard format for exporting music from other programs, so this capability may come in useful when importing files from a program that has a converter for a direct format.

`midi2ly` converts tracks into *Sezione “Staff”* in *Guida al Funzionamento Interno* and channels into *Sezione “Voice”* in *Guida al Funzionamento Interno* contexts. Relative mode is used for pitches, durations are only written when necessary.

It is possible to record a MIDI file using a digital keyboard, and then convert it to ‘.ly’. However, human players are not rhythmically exact enough to make a MIDI to LY conversion trivial. When invoked with quantizing (`-s` and `-d` options) `midi2ly` tries to compensate for these timing errors, but is not very good at this. It is therefore not recommended to use `midi2ly` for human-generated midi files.

It is invoked from the command-line as follows,

```
midi2ly [option]... midi-file
```

Note that by ‘command-line’, we mean the command line of the operating system. See *Sezione 4.3 [Converting from other formats], pagina 33*, for more information about this.

The following options are supported by `midi2ly`.

- `-a, --absolute-pitches`
Print absolute pitches.
- `-d, --duration-quant=DUR`
Quantize note durations on *DUR*.
- `-e, --explicit-durations`
Print explicit durations.
- `-h, --help`
Show summary of usage.
- `-k, --key=acc[:minor]`
Set default key. *acc* > 0 sets number of sharps; *acc* < 0 sets number of flats. A minor key is indicated by *:1*.
- `-o, --output=file`
Write output to *file*.
- `-s, --start-quant=DUR`
Quantize note starts on *DUR*.
- `-t, --allow-tuplet=DUR*NUM/DEN`
Allow tuplet durations *DUR*NUM/DEN*.
- `-v, --verbose`
Be verbose.
- `-V, --version`
Print version number.
- `-w, --warranty`
Show warranty and copyright.
- `-x, --text-lyrics`
Treat every text as a lyric.

Problemi noti e avvertimenti

Overlapping notes in an arpeggio will not be correctly rendered. The first note will be read and the others will be ignored. Set them all to a single duration and add phrase markings or pedal indicators.

4.3.2 Invoking musicxml2ly

MusicXML is an XML dialect for representing music notation.

`musicxml2ly` extracts the notes, articulations, score structure, lyrics, etc. from part-wise MusicXML files, and writes them to a `.ly` file. It is invoked from the command-line.

It is invoked from the command-line as follows,

```
musicxml2ly [option]... xml-file
```

Note that by ‘command-line’, we mean the command line of the operating system. See [Sezione 4.3 \[Converting from other formats\], pagina 33](#), for more information about this.

If the given filename is `-`, `musicxml2ly` reads input from the command line.

The following options are supported by `musicxml2ly`:

- `-a, --absolute`
convert pitches in absolute mode.
- `-h, --help`
print usage and option summary.
- `-l, --language=LANG`
use LANG for pitch names, e.g. ‘deutsch’ for note names in German.
- `--lxml` use the lxml.etree Python package for XML-parsing; uses less memory and cpu time.
- `--nd --no-articulation-directions`
do not convert directions (^, _ or -) for articulations, dynamics, etc.
- `--no-beaming`
do not convert beaming information, use LilyPond’s automatic beaming instead.
- `-o, --output=file`
set output filename to *file*. If *file* is `-`, the output will be printed on stdout. If not given, *xml-file*`.ly` will be used.
- `-r, --relative`
convert pitches in relative mode (default).
- `-v, --verbose`
be verbose.
- `--version`
print version information.
- `-z, --compressed`
input file is a zip-compressed MusicXML file.

4.3.3 Invoking abc2ly

Nota: This program is not supported, and may be remove from future versions of LilyPond.

ABC is a fairly simple ASCII based format. It is described at the ABC site:

<http://www.walshaw.plus.com/abc/learn.html>.

`abc2ly` translates from ABC to LilyPond. It is invoked as follows:

```
abc2ly [option]... abc-file
```

The following options are supported by `abc2ly`:

- `-b, --beams=None`
preserve ABC’s notion of beams

```
-h,--help
    this help

-o,--output=file
    set output filename to file.

-s,--strict
    be strict about success

--version
    print version information.
```

There is a rudimentary facility for adding LilyPond code to the ABC source file. If you say:

```
%%LY voices \set autoBeaming = ##f
```

This will cause the text following the keyword ‘voices’ to be inserted into the current voice of the LilyPond output file.

Similarly,

```
%%LY slyrics more words
```

will cause the text following the ‘slyrics’ keyword to be inserted into the current line of lyrics.

Problemi noti e avvertimenti

The ABC standard is not very ‘standard’. For extended features (e.g., polyphonic music) different conventions exist.

Multiple tunes in one file cannot be converted.

ABC synchronizes words and notes at the beginning of a line; `abc2ly` does not.

`abc2ly` ignores the ABC beaming.

4.3.4 Invoking `etf2ly`

Nota: This program is not supported, and may be removed from future versions of LilyPond.

ETF (Enigma Transport Format) is a format used by Coda Music Technology’s Finale product. `etf2ly` will convert part of an ETF file to a ready-to-use LilyPond file.

It is invoked from the command-line as follows.

```
etf2ly [option]... etf-file
```

Note that by ‘command-line’, we mean the command line of the operating system. See [Sezione 4.3 \[Converting from other formats\], pagina 33](#), for more information about this.

The following options are supported by `etf2ly`:

```
-h,--help
    this help

-o,--output=FILE
    set output filename to FILE

--version
    version information
```

Problemi noti e avvertimenti

The list of articulation scripts is incomplete. Empty measures confuse `etf2ly`. Sequences of grace notes are ended improperly.

4.3.5 Other formats

LilyPond itself does not come with support for any other formats, but some external tools can also generate LilyPond files. These are listed in [Sezione “Easier editing” in *Informazioni generali*](#).

4.4 LilyPond output in other programs

This section shows methods to integrate text and music, different than the automated method with `lilypond-book`.

Many quotes from a large score

If you need to quote many fragments from a large score, you can also use the clip systems feature, see [Sezione “Extracting fragments of music” in *Guida alla Notazione*](#).

Inserting LilyPond output into OpenOffice.org

LilyPond notation can be added to OpenOffice.org with [OOoLilyPond](#).

Inserting LilyPond output into other programs

To insert LilyPond output in other programs, use `lilypond` instead of `lilypond-book`. Each example must be created individually and added to the document; consult the documentation for that program. Most programs will be able to insert LilyPond output in ‘PNG’, ‘EPS’, or ‘PDF’ formats.

To reduce the white space around your LilyPond score, use the following options

```
\paper{
  indent=0\mm
  line-width=120\mm
  oddFooterMarkup=##f
  oddHeaderMarkup=##f
  bookTitleMarkup = ##f
  scoreTitleMarkup = ##f
}
```

```
{ c1 }
```

To produce a useful ‘EPS’ file, use

```
lilypond -dbackend=eps -dno-gs-load-fonts -dinclude-eps-fonts myfile.ly
```

‘PNG’:

```
lilypond -dbackend=eps -dno-gs-load-fonts -dinclude-eps-fonts --png myfile.ly
```

4.5 Independent includes

Some people have written large (and useful!) code that can be shared between projects. This code might eventually make its way into LilyPond itself, but until that happens, you must download and `\include` them manually.

4.5.1 MIDI articulation

LilyPond can be used to produce MIDI output, for “proof-hearing” what has been written. However, only dynamics, explicit tempo markings, and the notes and durations themselves are produced in the output.

The *articulate* project is one attempt to get more of the information in the score into the MIDI. It works by shortening notes not under slurs, to ‘articulate’ the notes. The amount of shortening depends on any articulation markings attached to a note: staccato halves the note

value, tenuto gives a note its full duration, and so on. The script also realises trills and turns, and could be extended to expand other ornaments such as mordents.

<http://www.nicta.com.au/people/chubbp/articulate>

Problemi noti e avvertimenti

Its main limitation is that it can only affect things it knows about: anything that is merely textual markup (instead of a note property) is still ignored.

5 Suggestions for writing files

Now you're ready to begin writing larger LilyPond input files – not just the little examples in the tutorial, but whole pieces. But how should you go about doing it?

As long as LilyPond can understand your input files and produce the output that you want, it doesn't matter what your input files look like. However, there are a few other things to consider when writing LilyPond input files.

- What if you make a mistake? The structure of a LilyPond file can make certain errors easier (or harder) to find.
- What if you want to share your input files with somebody else? In fact, what if you want to alter your own input files in a few years? Some LilyPond input files are understandable at first glance; others may leave you scratching your head for an hour.
- What if you want to upgrade your LilyPond file for use with a later version of LilyPond? The input syntax changes occasionally as LilyPond improves. Most changes can be done automatically with `convert-ly`, but some changes might require manual assistance. LilyPond input files can be structured in order to be easier (or harder) to update.

5.1 General suggestions

Here are a few suggestions that can help you to avoid or fix problems:

- **Include `\version` numbers in every file.** Note that all templates contain `\version` information. We highly recommend that you always include the `\version`, no matter how small your file is. Speaking from personal experience, it's quite frustrating to try to remember which version of LilyPond you were using a few years ago. `convert-ly` requires you to declare which version of LilyPond you used.
- **Include checks:** *Sezione “Bar and bar number checks” in Guida alla Notazione*, *Sezione “Octave checks” in Guida alla Notazione*. If you include checks every so often, then if you make a mistake, you can pinpoint it quicker. How often is ‘every so often’? It depends on the complexity of the music. For very simple music, perhaps just once or twice. For very complex music, perhaps every bar.
- **One bar per line of text.** If there is anything complicated, either in the music itself or in the output you desire, it's often good to write only one bar per line. Saving screen space by cramming eight bars per line just isn't worth it if you have to ‘debug’ your input files.
- **Comment your input files.** Use either bar numbers (every so often) or references to musical themes (‘second theme in violins,’ ‘fourth variation,’ etc.). You may not need comments when you're writing the piece for the first time, but if you want to go back to change something two or three years later, or if you pass the source over to a friend, it will be much more challenging to determine your intentions or how your file is structured if you didn't comment the file.
- **Indent your braces.** A lot of problems are caused by an imbalance in the number of { and }.
- **Explicitly add durations** at the beginnings of sections and variables. If you specify `c4 d e` at the beginning of a phrase (instead of just `c d e`) you can save yourself some problems if you rearrange your music later.
- **Separate tweaks** from music definitions. See *Sezione “Saving typing with variables and functions” in Manuale di Apprendimento*, and *Sezione “Style sheets” in Manuale di Apprendimento*.

5.2 Typesetting existing music

If you are entering music from an existing score (i.e., typesetting a piece of existing sheet music),

- Enter the manuscript (the physical copy of the music) into LilyPond one system at a time (but still only one bar per line of text), and check each system when you finish it. You may use the `showLastLength` or `showFirstLength` properties to speed up processing – see [Sezione “Skipping corrected music” in Guida alla Notazione](#).
- Define `mBreak = { \break }` and insert `\mBreak` in the input file whenever the manuscript has a line break. This makes it much easier to compare the LilyPond music to the original music. When you are finished proofreading your score, you may define `mBreak = { }` to remove all those line breaks. This will allow LilyPond to place line breaks wherever it feels are best.
- When entering a part for a transposing instrument into a variable, it is recommended that the notes are wrapped in

```
\transpose c natural-pitch {...}
```

(where `natural-pitch` is the open pitch of the instrument) so that the music in the variable is effectively in C. You can transpose it back again when the variable is used, if required, but you might not want to (e.g., when printing a score in concert pitch, converting a trombone part from treble to bass clef, etc.) Mistakes in transpositions are less likely if all the music in variables is at a consistent pitch.

Also, only ever transpose to/from C. That means that the only other keys you will use are the natural pitches of the instruments - bes for a B-flat trumpet, aes for an A-flat clarinet, etc.

5.3 Large projects

When working on a large project, having a clear structure to your lilypond input files becomes vital.

- **Use a variable for each voice**, with a minimum of structure inside the definition. The structure of the `\score` section is the most likely thing to change; the `violin` definition is extremely unlikely to change in a new version of LilyPond.

```
violin = \relative c'' {
g4 c'8. e16
}
...
\score {
  \new GrandStaff {
    \new Staff {
      \violin
    }
  }
}
```

- **Separate tweaks from music definitions**. This point was made previously, but for large projects it is absolutely vital. We might need to change the definition of `fthenp`, but then we only need to do this once, and we can still avoid touching anything inside `violin`.

```
fthenp = _\markup{
  \dynamic f \italic \small { 2nd } \hspace #0.1 \dynamic p }
violin = \relative c'' {
g4\fthenp c'8. e16
}
```

5.4 Troubleshooting

Sooner or later, you will write a file that LilyPond cannot compile. The messages that LilyPond gives may help you find the error, but in many cases you need to do some investigation to determine the source of the problem.

The most powerful tools for this purpose are the single line comment (indicated by `%`) and the block comment (indicated by `%{ ... %}`). If you don't know where a problem is, start commenting out huge portions of your input file. After you comment out a section, try compiling the file again. If it works, then the problem must exist in the portion you just commented. If it doesn't work, then keep on commenting out material until you have something that works.

In an extreme case, you might end up with only

```
\score {
  <<
    % \melody
    % \harmony
    % \bass
  >>
  \layout{ }
}
```

(in other words, a file without any music)

If that happens, don't give up. Uncomment a bit – say, the bass part – and see if it works. If it doesn't work, then comment out all of the bass music (but leave `\bass` in the `\score` uncommented).

```
bass = \relative c' {
%{
  c4 c c c
  d d d d
%}
}
```

Now start slowly uncommenting more and more of the `bass` part until you find the problem line.

Another very useful debugging technique is constructing *Sezione “Tiny examples” in Informazioni generali*.

5.5 Make and Makefiles

Pretty well all the platforms Lilypond can run on support a software facility called **make**. This software reads a special file called a **Makefile** that defines what files depend on what others and what commands you need to give the operating system to produce one file from another. For example the makefile would spell out how to produce ‘`ballad.pdf`’ and ‘`ballad.midi`’ from ‘`ballad.ly`’ by running Lilypond.

There are times when it is a good idea to create a **Makefile** for your project, either for your own convenience or as a courtesy to others who might have access to your source files. This is true for very large projects with many included files and different output options (e.g. full score, parts, conductor's score, piano reduction, etc.), or for projects that require difficult commands to build them (such as `lilypond-book` projects). Makefiles vary greatly in complexity and flexibility, according to the needs and skills of the authors. The program GNU Make comes installed on GNU/Linux distributions and on MacOS X, and it is also available for Windows.

See the **GNU Make Manual** for full details on using **make**, as what follows here gives only a glimpse of what it can do.

The commands to define rules in a makefile differ according to platform; for instance the various forms of Linux and MacOS use **bash**, while Windows uses **cmd**. Note that on MacOS X, you need to configure the system to use the command-line interpreter. Here are some example makefiles, with versions for both Linux/MacOS and Windows.

The first example is for an orchestral work in four movements with a directory structure as follows:

```
Symphony/
|-- MIDI/
|-- Makefile
|-- Notes/
|   |-- cello.ily
|   |-- figures.ily
|   |-- horn.ily
|   |-- oboe.ily
|   |-- trioString.ily
|   |-- viola.ily
|   |-- violinOne.ily
|   `-- violinTwo.ily
|-- PDF/
|-- Parts/
|   |-- symphony-cello.ly
|   |-- symphony-horn.ly
|   |-- symphony-oboes.ly
|   |-- symphony-viola.ly
|   |-- symphony-violinOne.ly
|   `-- symphony-violinTwo.ly
|-- Scores/
|   |-- symphony.ly
|   |-- symphonyI.ly
|   |-- symphonyII.ly
|   |-- symphonyIII.ly
|   `-- symphonyIV.ly
`-- symphonyDefs.ily
```

The `.ly` files in the `Scores` and `Parts` directories get their notes from `.ily` files in the `Notes` directory:

```
%%% top of file "symphony-cello.ly"
\include ../definitions.ily
\include ../Notes/cello.ily
```

The makefile will have targets of **score** (entire piece in full score), **movements** (individual movements in full score), and **parts** (individual parts for performers). There is also a target **archive** that will create a tarball of the source files, suitable for sharing via web or email. Here is the makefile for GNU/Linux or MacOS X. It should be saved with the name **Makefile** in the top directory of the project:

Nota: When a target or pattern rule is defined, the subsequent lines must begin with tabs, not spaces.

```
# the name stem of the output files
piece = symphony
# determine how many processors are present
CPU_CORES=`cat /proc/cpuinfo | grep -m1 "cpu cores" | sed s/".*: "//`
```

```

# The command to run lilypond
LILY_CMD = lilypond -ddelete-intermediate-files \
               -dno-point-and-click -djob-count=$(CPU_CORES)

# The suffixes used in this Makefile.
.SUFFIXES: .ly .ily .pdf .midi

# Input and output files are searched in the directories listed in
# the VPATH variable. All of them are subdirectories of the current
# directory (given by the GNU make variable `CURDIR').
VPATH = \
    $(CURDIR)/Scores \
    $(CURDIR)/PDF \
    $(CURDIR)/Parts \
    $(CURDIR)/Notes

# The pattern rule to create PDF and MIDI files from a LY input file.
# The .pdf output files are put into the `PDF' subdirectory, and the
# .midi files go into the `MIDI' subdirectory.
%.pdf %.midi: %.ly
    $(LILY_CMD) $<; \
    if test -f "$*.pdf"; then \
        mv "$*.pdf" PDF/; \
    fi; \
    if test -f "$*.midi"; then \
        mv "$*.midi" MIDI/; \
    fi

notes = \
    cello.ily \
    horn.ily \
    oboe.ily \
    viola.ily \
    violinOne.ily \
    violinTwo.ily

# The dependencies of the movements.
$(piece)I.pdf: $(piece)I.ly $(notes)
$(piece)II.pdf: $(piece)II.ly $(notes)
$(piece)III.pdf: $(piece)III.ly $(notes)
$(piece)IV.pdf: $(piece)IV.ly $(notes)

# The dependencies of the full score.
$(piece).pdf: $(piece).ly $(notes)

# The dependencies of the parts.
$(piece)-cello.pdf: $(piece)-cello.ly cello.ily
$(piece)-horn.pdf: $(piece)-horn.ly horn.ily
$(piece)-oboes.pdf: $(piece)-oboes.ly oboe.ily
$(piece)-viola.pdf: $(piece)-viola.ly viola.ily
$(piece)-violinOne.pdf: $(piece)-violinOne.ly violinOne.ily
$(piece)-violinTwo.pdf: $(piece)-violinTwo.ly violinTwo.ily

```

```

# Type `make score' to generate the full score of all four
# movements as one file.
.PHONY: score
score: $(piece).pdf

# Type `make parts' to generate all parts.
# Type `make foo.pdf' to generate the part for instrument `foo'.
# Example: `make symphony-cello.pdf'.
.PHONY: parts
parts: $(piece)-cello.pdf \
      $(piece)-violinOne.pdf \
      $(piece)-violinTwo.pdf \
      $(piece)-viola.pdf \
      $(piece)-oboes.pdf \
      $(piece)-horn.pdf

# Type `make movements' to generate files for the
# four movements separately.
.PHONY: movements
movements: $(piece)I.pdf \
           $(piece)II.pdf \
           $(piece)III.pdf \
           $(piece)IV.pdf

all: score parts movements

archive:
    tar -cvvf stamitz.tar \          # this line begins with a tab
    --exclude=*pdf --exclude=~ \
    --exclude=*midi --exclude=*.tar \
    ../Stamitz/*

```

There are special complications on the Windows platform. After downloading and installing GNU Make for Windows, you must set the correct path in the system's environment variables so that the DOS shell can find the Make program. To do this, right-click on "My Computer," then choose **Properties** and **Advanced**. Click **Environment Variables**, and then in the **System Variables** pane, highlight **Path**, click **edit**, and add the path to the GNU Make executable file, which will look something like this:

```
C:\Program Files\GnuWin32\bin
```

The makefile itself has to be altered to handle different shell commands and to deal with spaces that are present in some default system directories. The **archive** target is eliminated since Windows does not have the **tar** command, and Windows also has a different default extension for midi files.

```

## WINDOWS VERSION
##
piece = symphony
LILY_CMD = lilypond -ddelete-intermediate-files \
                -dno-point-and-click \
                -djob-count=$(NUMBER_OF_PROCESSORS)

#get the 8.3 name of CURDIR (workaround for spaces in PATH)

```

```

workdir = $(shell for /f "tokens=*" %%b in ("$(CURDIR)") \
do @echo %%~sb)

.SUFFIXES: .ly .ily .pdf .mid

VPATH = \
$(workdir)/Scores \
$(workdir)/PDF \
$(workdir)/Parts \
$(workdir)/Notes

%.pdf %.mid: %.ly
    $(LILY_CMD) $<      # this line begins with a tab
    if exist "$*.pdf" move /Y "$*.pdf" PDF/ # begin with tab
    if exist "$*.mid" move /Y "$*.mid" MIDI/ # begin with tab

notes = \
cello.ily \
figures.ily \
horn.ily \
oboe.ily \
trioString.ily \
viola.ily \
violinOne.ily \
violinTwo.ily

$(piece)I.pdf: $(piece)I.ly $(notes)
$(piece)II.pdf: $(piece)II.ly $(notes)
$(piece)III.pdf: $(piece)III.ly $(notes)
$(piece)IV.pdf: $(piece)IV.ly $(notes)

$(piece).pdf: $(piece).ly $(notes)

$(piece)-cello.pdf: $(piece)-cello.ly cello.ily
$(piece)-horn.pdf: $(piece)-horn.ly horn.ily
$(piece)-oboes.pdf: $(piece)-oboes.ly oboe.ily
$(piece)-viola.pdf: $(piece)-viola.ly viola.ily
$(piece)-violinOne.pdf: $(piece)-violinOne.ly violinOne.ily
$(piece)-violinTwo.pdf: $(piece)-violinTwo.ly violinTwo.ily

.PHONY: score
score: $(piece).pdf

.PHONY: parts
parts: $(piece)-cello.pdf \
$(piece)-violinOne.pdf \
$(piece)-violinTwo.pdf \
$(piece)-viola.pdf \
$(piece)-oboes.pdf \
$(piece)-horn.pdf

.PHONY: movements

```

```

movements: $(piece)I.pdf \
            $(piece)II.pdf \
            $(piece)III.pdf \
            $(piece)IV.pdf

```

```
all: score parts movements
```

The next Makefile is for a `lilypond-book` document done in LaTeX. This project has an index, which requires that the `latex` command be run twice to update links. Output files are all stored in the `out` directory for `.pdf` output and in the `htmlout` directory for the html output.

```

SHELL=/bin/sh
FILE=myproject
OUTDIR=out
WEBDIR=htmlout
VIEWER=acroread
BROWSER=firefox
LILYBOOK_PDF=lilypond-book --output=$(OUTDIR) --pdf $(FILE).lytex
LILYBOOK_HTML=lilypond-book --output=$(WEBDIR) $(FILE).lytex
PDF=cd $(OUTDIR) && pdflatex $(FILE)
HTML=cd $(WEBDIR) && latex2html $(FILE)
INDEX=cd $(OUTDIR) && makeindex $(FILE)
PREVIEW=$(VIEWER) $(OUTDIR)/$(FILE).pdf &

```

```
all: pdf web keep
```

```

pdf:
    $(LILYBOOK_PDF) # begin with tab
    $(PDF)          # begin with tab
    $(INDEX)        # begin with tab
    $(PDF)          # begin with tab
    $(PREVIEW)      # begin with tab

```

```

web:
    $(LILYBOOK_HTML) # begin with tab
    $(HTML)          # begin with tab
    cp -R $(WEBDIR)/$(FILE)/ ./ # begin with tab
    $(BROWSER) $(FILE)/$(FILE).html & # begin with tab

```

```

keep: pdf
    cp $(OUTDIR)/$(FILE).pdf $(FILE).pdf # begin with tab

```

```

clean:
    rm -rf $(OUTDIR) # begin with tab

```

```

web-clean:
    rm -rf $(WEBDIR) # begin with tab

```

```

archive:
    tar -cvvf myproject.tar \ # begin this line with tab
    --exclude=out/* \
    --exclude=htmlout/* \
    --exclude=myproject/* \

```

```
--exclude=*midi \  
--exclude=*pdf \  
--exclude=*~ \  
../MyProject/*
```

TODO: make this thing work on Windows

The previous makefile does not work on Windows. An alternative for Windows users would be to create a simple batch file containing the build commands. This will not keep track of dependencies the way a makefile does, but it at least reduces the build process to a single command. Save the following code as `build.bat` or `build.cmd`. The batch file can be run at the DOS prompt or by simply double-clicking its icon.

```
lilypond-book --output=out --pdf myproject.lytex  
cd out  
pdflatex myproject  
makeindex myproject  
pdflatex myproject  
cd ..  
copy out\myproject.pdf MyProject.pdf
```

Vedi anche

This manual: [\[Command-line usage\]](#), pagina [\[undefined\]](#), Capitolo 3 [\[lilypond-book\]](#), pagina 14

Appendix A GNU Free Documentation License

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