CARILLON.PY

Manage a church or other electronic carillon to playout user-provided .mp3 files of songs, peals, tolls, and hourly strikes at scheduled system date/day/time(s).

Requires Python3. No desktop required. The script implements a simple text-based interface between stdin and stdout for deleting or adding scheduled playouts. Requires the playsound module which in turn uses windll.winm on Windows, AppKit.NSSound on Apple OS, or GStreamer on Linux but is otherwise dependency-free. The Playsound module for Python2 is incompatible with that for Python3, so if Python2 is present on the target system, playsound must also be installed with pip3.

Running standlone, main() launches a non-daemon playout thread, displays instructions and an exemplary default schedule for a tower clock, prompts with ">", then waits on user input. A simple line number editor permits the addition, deletion, or replacement of scheduled events, including the default ones. Except for entry of a "?" to request display of the instructions or a line number alone to delete a line, command line fields are parsed by space and validated before the schedule list is modified. Schedule lines are renumbered consecutively after a deletion. Line numbers are insignificant other than to prioritize playouts set for the same system minute. The schedule is re-displayed after any change.

All scheduled playouts occur at xx:xx:00 system times, so upon launch, the playout thread waits on the system minute, then scans the schedule list and plays any entries. Upon completion of the last entry, it calculates the time to the next system minute then requests sleep from the platform. Upon wake, it again waits on the system minute and scans again. Note that a playout of length exceeding one minute may preempt another playout scheduled for that or the next minute. If an unanticipated user error makes its way into the schedule list or the list is otherwise corrupted and an event cannot be played, the defective event is removed from the schedule list.

The schedule is a list of nested event lists which in turn are a mix of types depending on whether they are matched exactly or with ranges in playout(). The file to be played is either a filename specified by the user or the keyword 'Strike.' If .mp3 does not end the file name, it is appended. If a Strike is called, the file name is assumed to be Strikex.mp3 or Strikexx.mp3 where the x is the number of strikes to be heard between 1-12. Twelve files are used since playout() appears to render the silent header frame which would create an audible gap between strikes. Playout requires a fully formed file path and name, which is platform-dependent and prepended from line 17 of the script.

The displayed instructions are:

```
- Enter Line# Day(s) Hour(s) Minute and Tune or Strike<enter> to add or edit.
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- Separate line# and event parameters with a single space.
- Day is mm/dd/yy, su, mo, tu, we, th, fr, or sa.
- Hour is 24-hour time between 0 and 23.
- Minute is between 0 to 59. Event plays at hh:mm:00.
- Ranges are allowed: 0-23 = hourly, su-sa = daily.
- Tunes are filenames and are cAsE SeNsiTiVe.
- Line#<enter> to delete a line.
- ?<enter> to repeat these instructions
```

The default Schedule (as for a tower clock) is

```
Day(s) Hr(s) Min Tune
1: su-sa 0-23 59 Hour
2: su-sa 0-23 0 Strike
3: su-sa 0-23 15 Quarter
4: su-sa 0-23 30 Half
5: su-sa 0-23 45 ThreeQuarter
```

The sample .mp3 files for the Westminster Quarters are derivatives of “Carillon Bells » Westminster Chimes Full.mp3” uploaded to the Creative Commons by user eblockofsound235 on February 4th, 2019. The Half and ThreeQuarter melodies are extractions of the second through fifth crotchets of the original; the Quarter is a permutation of the fourth. The Hour melody has a 0:45 second silent preamble so it can be fired at :59 and will abut a strike fired at :00. All Quarters have a 3 second final strike and are in the key of F, though the Wikipedia description for them is that they are in the key of E. https://freesound.org/people/theblockofsound235/sounds/458302/

The twelve hourly strikes are derivatives of “Carillon Bells » 12 Noon Hour Bell Strike.mp3” uploaded to the Commons by the above user on the same date. Its “prime” pitch was resampled down from D#5 to C5 to place it in within the same key as the Quarters. The cadence was shortened to 2 seconds per strike but for the twelfth strike.