Timeless Tunes: Tracing the Evolution and Endurance of Musical Legends

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Abstract

Abstract to be written here. The abstract should not be too long and should provide the reader with a good understanding what you are writing about. Academic papers are not like novels where you keep the reader in suspense. To be effective in getting others to read your paper, be as open and concise about your findings here as possible. Ideally, upon reading your abstract, the reader should feel he / she must read your paper in entirety.

0.0.1. Loading in the data:

duration: Duration in seconds release_date: Album release date album_name: Name of CD / album explicit: Whether song contains explicit lyrics or not. popularity: popularity score (out of 100) acousticness: A confidence measure from 0.0 to 1.0 of whether the track is acoustic; acoustic means 'without electrical amplification' – an acoustic guitar versus an electric guitar, for example. danceability: Describes how suitable a track is for dancing based on a combination of musical elements including tempo, rhythm stability, beat strength, and overall regularity. energy: song energy is the sense of forward motion in music, whatever keeps the listener engaged and listening. In loud music, musical energy is easy to identify. We notice the energy more as the drums get busier and play louder, and as the singer sings higher. instrumentalness: Instrumentalness predicts whether a track contains vocals. Instrumentalness is measured on a scale of 0 (likely contains vocal content) to 100 (likely contains no vocal content). Songs with higher instrumentalness are less likely to have vocals liveness: Detects the presence of an audience in the recording. Higher liveness values represent an increased probability that the track was performed live. A value above 0.8 provides strong likelihood that the track is live. loudness: LUFS metering is the most accurate way of measuring perceived loudness because it resembles human hearing more closely than other meters. speechiness: Speechiness detects the presence of spoken words in a track. The more exclusively speech-like the recording (e.g. talk show, audio book, poetry), the closer to 1.0 the attribute value. Values above 0.66 describe tracks

that are probably made entirely of spoken words. tempo: In simple terms, tempo is how fast or slow a piece of music is performed, while rhythm is the placement of sounds in time, in a regular and repeated pattern. Tempo generally is measured as the number of beats per minute, where the beat is the basic measure of time in music. valence: Describes the musical positiveness conveyed by a track. Tracks with high valence sound more positive (e.g. happy, cheerful, euphoric), while tracks with low valence sound more negative (e.g. sad, depressed, angry)

```
## [1] "date"            "rank"            "song"            "artist"
## [5] "last-week"       "peak-rank"       "weeks-on-board"
```

```
##  [1] "name"                "duration"        "release_date"    "album_name"
##  [5] "explicit"            "popularity"      "acousticness"    "danceability"
##  [9] "energy"              "instrumentalness" "liveness"       "loudness"
## [13] "speechiness"         "tempo"           "valence"
```

```
##  [1] "name"                "album"           "duration"        "popularity"
##  [5] "release_date"        "danceability"    "energy"          "loudness"
##  [9] "speechiness"         "acousticness"    "instrumentalness" "liveness"
## [13] "valence"             "tempo"
```

```
##  [1] "track_id"            "name"            "artist"
##  [4] "spotify_preview_url" "spotify_id"      "tags"
##  [7] "genre"               "year"            "duration"
## [10] "danceability"        "energy"          "key"
## [13] "loudness"            "speechiness"     "acousticness"
## [16] "instrumentalness"    "liveness"        "valence"
## [19] "tempo"
```

```
##  [1]  TRUE  TRUE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE  TRUE
## [13]  TRUE  TRUE  TRUE
```

So it would appear that album_name is not in the metallica set the equivalent one is just album, and we do not have a variable for explicit in the metallica dataset which is not surprsing since all would be true anyway.

I will rename the variable album_name to album in the coldplay dataset

I think there is something that I can do with the date columns here as well..

0.0.2. NOTE: population data not required here

1. Introduction

References are to be made as follows: Fama & French ([1997: 33code]) and Grinold & Kahn ([2000code]) Such authors could also be referenced in brackets ([Grinold & Kahn, 2000code]) and together Grinold & Kahn ([2000code]). Source the reference code from scholar.google.com by clicking on "cite'' below article name. Then select BibTeX at the bottom of the Cite window, and proceed to copy and paste this code into your ref.bib file, located in the directory's Tex folder. Open this file in Rstudio for ease of management, else open it in your preferred Tex environment. Add and manage your article details here for simplicity - once saved, it will self-adjust in your paper.

> I suggest renaming the top line after @article, as done in the template ref.bib file, to something more intuitive for you to remember. Do not change the rest of the code. Also, be mindful of the fact that bib references from google scholar may at times be incorrect. Reference Latex forums for correct bibtex notation.

To reference a section, you have to set a label using "\label'' in R, and then reference it in-text as e.g. referencing a later section, Section 3.

Writing in Rmarkdown is surprizingly easy - see this website cheatsheet for a summary on writing Rmd writing tips.

Data

Notice how I used the curly brackets and dash to remove the numbering of the data section.

Discussion of data should be thorough with a table of statistics and ideally a figure.

In your tempalte folder, you will find a Data and a Code folder. In order to keep your data files neat, store all of them in your Data folder. Also, I strongly suggest keeping this Rmd file for writing and executing commands, not writing out long pieces of data-wrangling. In the example below, I simply create a ggplot template for scatter plot consistency. I suggest keeping all your data in a data folder.

To make your graphs look extra nice in latex world, you could use Tikz device. Replace dev - 'png' with 'tikz' in the chunk below. Notice this makes the build time longer and produces extra tex files - so if you are comfortable with this, set your device to Tikz and try it out: ,

To reference the plot above, add a "\label'' after the caption in the chunk heading, as done above. Then reference the plot as such: As can be seen, Figures **??** and **??** are excellent, with Figure **??** being particularly aesthetically pleasing due to its device setting of Tikz. The nice thing now is that it correctly numbers all your figures (and sections or tables) and will update if it moves. The links are also dynamic.

I very strongly suggest using ggplot2 (ideally in combination with dplyr) using the ggtheme package to change the themes of your figures.

Also note the information that I have placed above the chunks in the code chunks for the figures. You can edit any of these easily - visit the Rmarkdown webpage for more information.

2. Splitting a page

You can also very easily split a page using built-in Pandoc formatting. I comment this out in the code (as this has caused issues building the pdf for some users - which I presume to be a Pandoc issue), but you are welcome to try it out yourself by commenting out the following section in your Rmd file.

3. Methodology

3.1. Subsection

Ideally do not overuse subsections. It equates to bad writing.[1]

3.2. Math section

Equations should be written as such:

$$\beta = \sum_{i=1}^{\infty} \frac{\alpha^2}{\sigma_{t-1}^2} \tag{3.1}$$

$$\int_{x=1}^{\infty} x_i = 1$$

---

[1]This is an example of a footnote by the way. Something that should also not be overused.

If you would like to see the equations as you type in Rmarkdown, use $ symbols instead (see this for yourself by adjusted the equation):

$$\beta = \sum_{i=1}^{\infty} \frac{\alpha^2}{\sigma_{t-1}^2} \int_{x=1}^{\infty} x_i = 1$$

Note the equation above - this should appear in math in Rstudio. Writing nice math requires practice. Note I used a forward slashes to make a space in the equations. I can also align equations using **&**, and set to numbering only the first line. Now I will have to type "begin equation'' which is a native LATEXcommand. Here follows a more complicated equation that you want aligned (using & sign) and numbered:

$$
\begin{aligned}
y_t &= c + B(L)y_{t-1} + e_t \\
e_t &= H_t^{1/2} z_t; \quad z_t \sim N(0, I_N) \quad \& \quad H_t = D_t R_t D_t \\
D_t^2 &= \sigma_{1,t}, \ldots, \sigma_{N,t} \\
\sigma_{i,t}^2 &= \gamma_i + \kappa_{i,t} v_{i,t-1}^2 + \eta_i \sigma_{i,t-1}^2, \quad \forall i \\
R_{t,i,j} &= diag(Q_{t,i,j}^{-1}).Q_{t,i,j}.diag(Q_{t,i,j}^{-1}) \\
Q_{t,i,j} &= (1 - \alpha - \beta)\bar{Q} + \alpha z_t z_t' + \beta Q_{t,i,j}
\end{aligned}
\tag{3.2}
$$

Note that in 3.2 I have aligned the equations by the equal signs. I also want only one tag, and I create spaces using "quads''.

See if you can figure out how to do complex math using the two examples provided in 3.1 and 3.2.

4. Including an external plot

You can also include plots produced outside of your Rmarkdown file using the package *knitr*

See below chunk:

5. Results

Tables can be included as follows. Use the *xtable* (or kable) package for tables. Table placement = H implies Latex tries to place the table Here, and not on a new page (there are, however, very many

ways to skin this cat. Luckily there are many forums online!).

To reference calculations **in text**, *do this:* From table **??** we see the average value of mpg is 20.98.

Including tables that span across pages, use the following (note that I add below the table: "continue on the next page''). This is a neat way of splitting your table across a page.

Use the following default settings to build your own possibly long tables. Note that the following will fit on one page if it can, but cleanly spreads over multiple pages:

5.1. Huxtable

Huxtable is a very nice package for making working with tables between Rmarkdown and Tex easier.

This cost some adjustment to the Tex templates to make it work, but it now works nicely.

See documentation for this package here. A particularly nice addition of this package is for making the printing of regression results a joy (see here). Here follows an example:

If you are eager to use huxtable, comment out the Huxtable table in the Rmd template, and uncomment the colortbl package in your Rmd's root.

Note that I do not include this in the ordinary template, as some latex users have complained it breaks when they build their Rmds (especially those using tidytex - I don't have this problem as I have the full Miktex installed on mine). Up to you, but I strongly recommend installing the package manually and using huxtable. To make this work, uncomment the *Adding additional latex packages* part in yaml at the top of the Rmd file. Then comment out the huxtable example in the template below this line. Reknit, and enjoy.

FYI - R also recently introduced the gt package, which is worthwhile exploring too.

6. Lists

To add lists, simply using the following notation

- This is really simple
  - Just note the spaces here - writing in R you have to sometimes be pedantic about spaces. . .

- Note that Rmarkdown notation removes the pain of defining LaTeXenvironments!

7. Conclusion

I hope you find this template useful. Remember, stackoverflow is your friend - use it to find answers to questions. Feel free to write me a mail if you have any questions regarding the use of this package. To cite this package, simply type citation("Texevier") in Rstudio to get the citation for Katzke ([2017code]) (Note that uncited references in your bibtex file will not be included in References).

References

Fama, E.F. & French, K.R. 1997. Industry costs of equity. *Journal of financial economics.* 43(2):153–193.

Grinold, R.C. & Kahn, R.N. 2000. Active portfolio management.

Katzke, N.F. 2017. *Texevier: Package to create elsevier templates for rmarkdown.* Stellenbosch, South Africa: Bureau for Economic Research.

Appendix

Appendix A

Some appendix information here

Appendix B