R Markdown Template

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S1 Introduction

For large files, we can cache the file, and use `cache.lazy = T` to reuse the pre-computed results. To avoid overwriting the previously cached file, it is better to set the `cache= F`, when you want to use cachy.lazy to get the previously saved results. In this case, you do not need to cache the file again. You can also load the cached file, and check the environment to see whether the variables have already been saved.

If `cache = T`, knitr will skip the execution of this code chunk if it has been executed before and nothing in the code chunk has changed since then. This is particularly useful when you want to reuse the figure (time-consuming). **When you modify the code chunk (e.g., revise the code or the chunk options), the previous cache will be automatically invalidated, and knitr will cache the chunk again.**

You can also use cross-reference for a section S2.

You can also cite a paper like this (Kirby et al. 2016).

```
print("Hello R markdown!")
```

```
[1] "Hello R markdown!"
```

S2 Data and Methods

```
#include <Rcpp.h>
using namespace Rcpp;
// [[Rcpp::export]]
NumericVector timesTwo(NumericVector x) {
  return x * 2;
}
```

```
timesTwo(10) # test function in R chunk or console
```

```
data{
int N; // number of observations
int H; // number of observed head
}
parameters{
real<lower=0, upper=1> p; // parameter for binomial distribution
}
model{
// you can also specify the prior here.
// If you leave it empty, it will use a flat or uniform prior
p ~ uniform(0, 1);
H ~ binomial(N, p); // likelihood func
}
```

S3 Results

We can also save the plot as png files, by setting the dev = "png", and change the quality of the picture by setting dpi = 300.

Alternatively, you can convert all the saved pdfs into pngs with imagemagick in terminal:

convert -density 150 *.pdf -quality 100 -set filename:basename "%[basename]" "%[filename:basename].png"

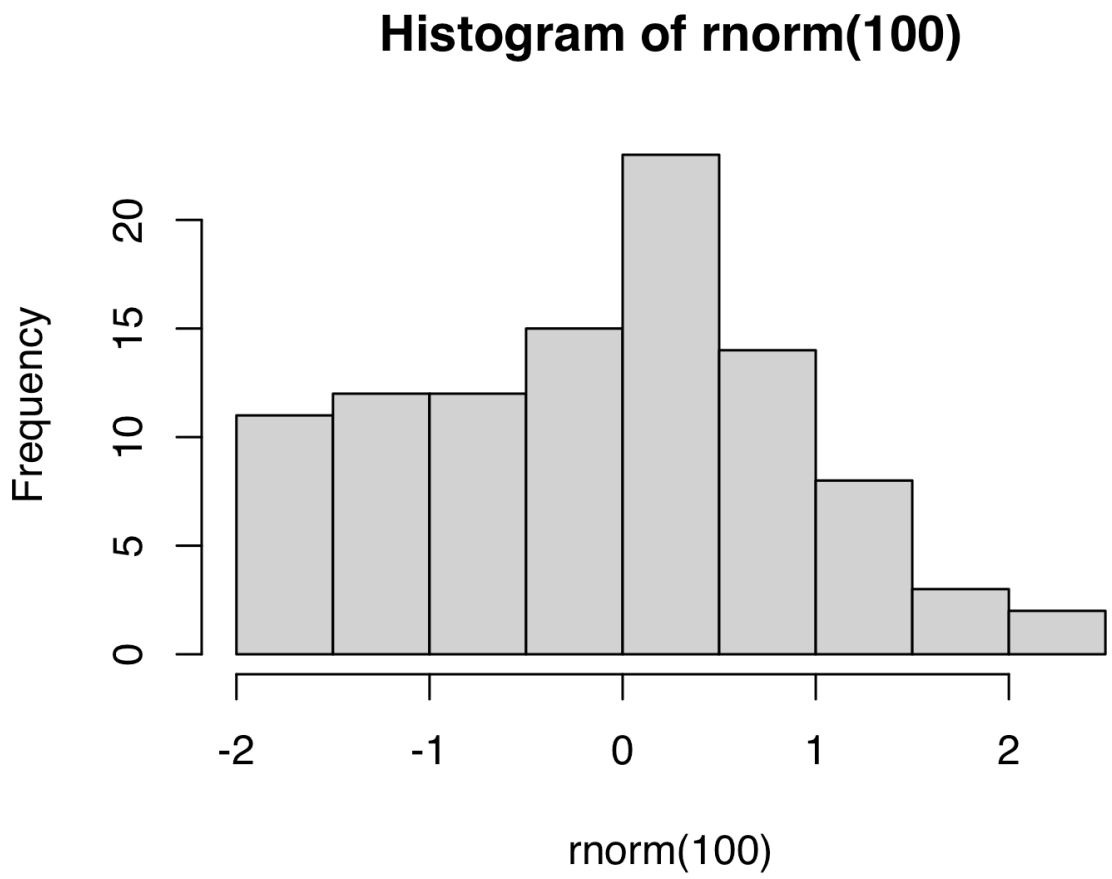


Figure S1: Histogram plot

S3.1 Cross-reference of figures, tables and equations

Note: this kind of citation co-reference is only working for bookdown::pdf_document2:, not working for pdf_document.

We can also co-refer a plot in Figure S1. **Note:** you need to set `include = T` when producing the plot. Otherwise, the co-reference won't work. Pls avoid using underscore (_) or white space in the co-reference labels. Likewise, you can also use `\@ref(tab/eq:)` to refer to the specific table or equation. See Figure @ref{fig:CTMCgraphs}.

```
# two ways of include a picture in R
# ![example picture](./figures/histogram-1.png){width=90% height=80%}
knitr::include_graphics("./figures/histogram-rng-1.png")
```

S3.2 Citations

You can cite a paper in Rmarkdown in different ways, e.g., if you want to have the citation with exact page number. You can use the following ways (see Jing, Blasi, and Bickel 2022, p.45) or Jing, Blasi, and Bickel (2022, pp. 404).

S4 Discussion

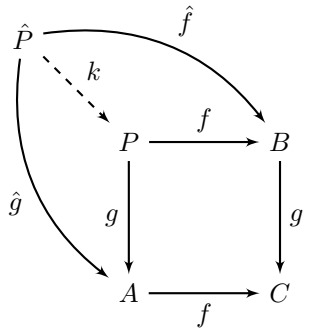
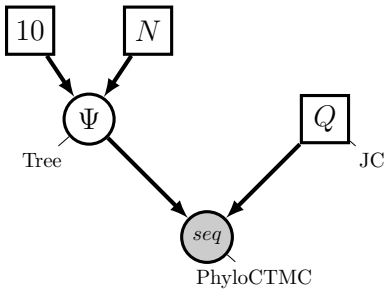


Figure S2: Tikz graph example

S5 Conclusions

Note: it seems that tikz does not support both fig.cap and fig.scap at the same time. It may cause fig.cap cannot recognize the latex code.




```
psi ~ dnUniformTopologyBranchLength(names, dnExponential(10))

Q_morpho <- fnJC(2)

phyMorpho ~ dnPhyloCTMC( tree=phylogeny,
siteRates=rates_morpho, Q=Q_morpho,
type="Standard", coding="variable" )

phyMorpho.clamp( data )
```

Figure S3: A example graphs of CTMC model (fig.size cannot be changed via fig.width or fig.height)

We can also add the cross-reference inside the figure cation via `\\ref{fig:}`.

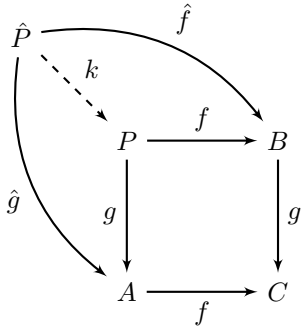


Figure S4: A copy of CTMC model in Figure S1 or Figure S1 (reuse by its labels; doesn't work for read_utf8)

References

Kirby, Kathryn R., Russell D. Gray, Simon J. Greenhill, Fiona M. Jordan, Stephanie Gomes-Ng, Hans-Jörg Bibiko, Damián E. Blasi, Carlos A. Botero, Claire Bowern, Carol R. Ember, Dan Leehr, Bobbi S. Low, Joe McCarter, William Divale, and Michael C. Gavin (2016). D-PLACE: A Global Database of Cultural, Linguistic and Environmental Diversity. *PLOS ONE* 11.7, e0158391. DOI: 10.1371/journal.pone.0158391.

Jing, Yingqi, Damián E Blasi, and Balthasar Bickel (2022). Dependency-length minimization and its limits: A possible role for a probabilistic version of the final-over-final condition. *Language* 98.3, 397–418. DOI: 10.1353/lan.0.0267.