

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 `cache.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.**

```
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
```

S2.1 Color stan chunk

```
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"
```

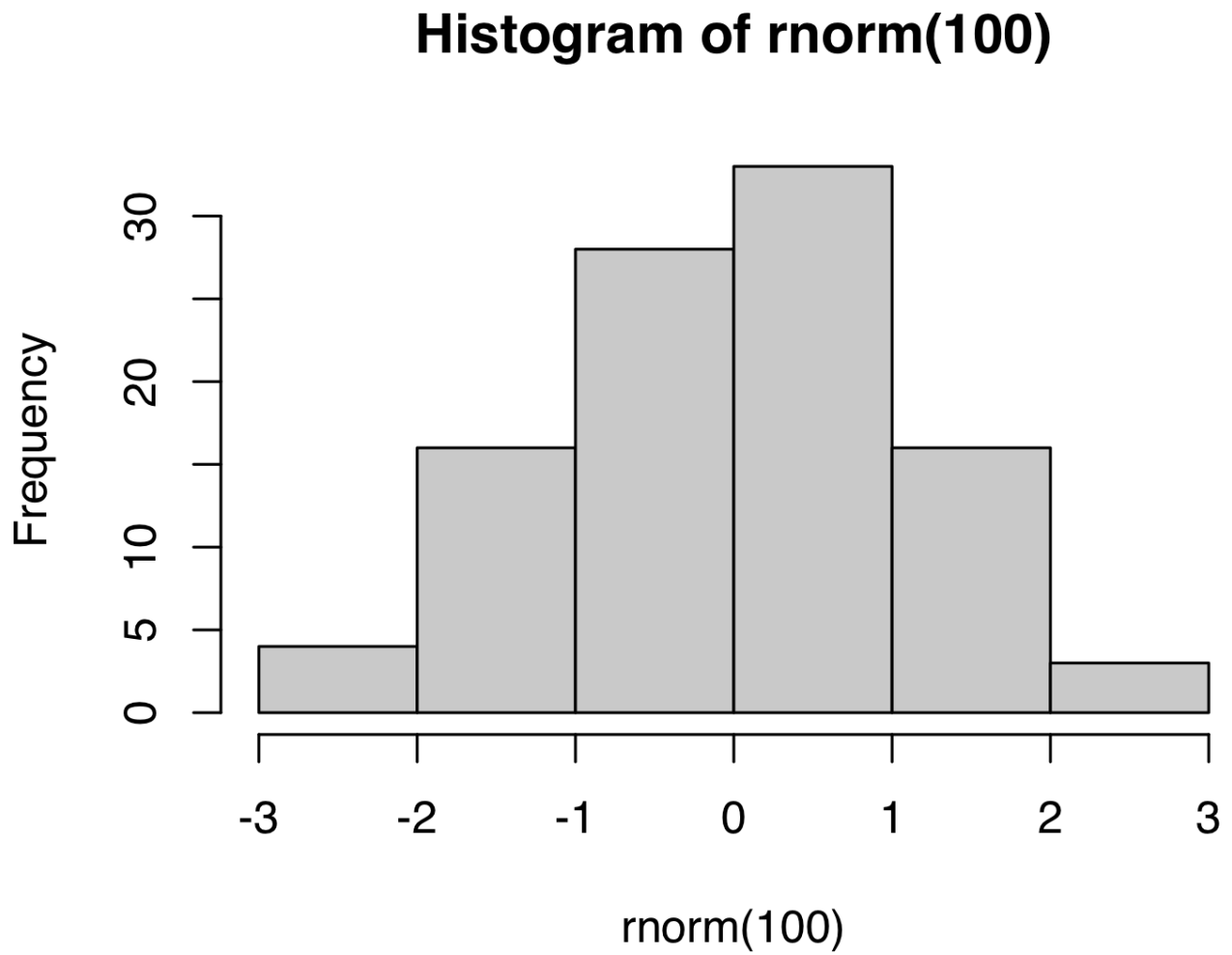


Figure S1: Histogram plot

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

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 S4.



Figure S2: Histogram plot from R Core Team (2020)

S4 Discussion

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.

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

References

R Core Team (2020). *R: A Language and Environment for Statistical Computing*. <https://www.R-project.org/>. R Foundation for Statistical Computing.

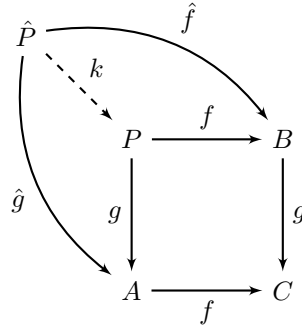
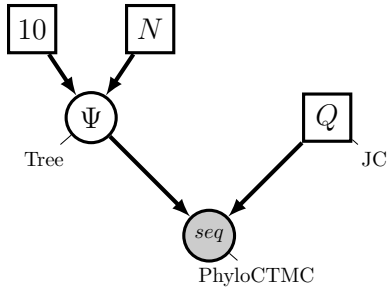


Figure S3: Tikz graph example



```
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 S4: A example graphs of CTMC model (fig.size cannot be changed via fig.width or fig.height)

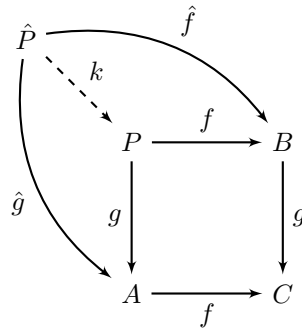


Figure S5: A copy of CTMC model in Figure S1 or Figure S1 (reuse by its labels; doesn't work for read_utf8)