

A Sample R Markdown Template

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Abstract

The objective of this document's template is to demonstrate some basics of the combination of R and markdown and how they can be knitted together using the knitr package (via the RStudio IDE) to produce beautiful docs/reports.

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The options mentioned in the header of this Rmarkdown file (with an extension of .Rmd) above for a pdf document can be modified as well as supplemented by options for other document formats.(Please see the “Output Options” section of RStudio’s reference site at <http://rmarkdown.rstudio.com/> for more information.)

Did you notice that this thing was in bold and that the previous thing was a web link?

1 Lists

1.1 Numbered list

Material for this document has been heavily borrowed from several documents.(Notice how a numbered list is being created below.)

1. Markdown cheatsheet at <http://warpedvisions.org/projects/markdown-cheat-sheet.md>.
2. R markdown reference from R Studio's site at <http://rmarkdown.rstudio.com/>
3. http://rmarkdown.rstudio.com/authoring_basics.html
 - Item 3a
 - Item 3b
4. Source 4

1.2 Bulleted (unordered) list

As previously mentioned, the objectives of this document are two fold.

- Learn the basics of markdown
- Learn how R code and output can be interspersed with markdown to create reports/documents.
- Another one
 - Item 3a
 - Item 3b
- And yet another one

2 How can headers be defined?

The header used above can be created using a different approach, using a single *hashtag* (wasn't that in *italics*?) to the left of the title of the header.

3 Header 1

3.1 Header 2

3.1.1 Header 3

3.1.1.1 Header 4

3.1.1.1.1 Header 5

4 Images

You can insert images in the document as well. For instance, if you have an image of a real apple in your working directory, then you can insert it in the document in the following manner.

If you wanted to show an images from a website, then that can also be done.



Figure 1: This is a picture of a honey crisp apple

5 Tables

Header	Header	Right
Cell	Cell	\$10
Cell	Cell	\$20

- Outer pipes on tables are optional (if you are not concerned with aesthetics, just drop)
- Colon used for alignment (right versus left)

6 HTML Tags

You can use html tags as well in markdown documents. For example, you could've used an `` tag to insert images. Super basics of html can be [found here](#)

7 Equation

Standard deviation, $s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$

8 Blockquotes

A friend once said:

It's always better to give than to receive.

9 Manual Line Breaks

End a line with two or more spaces

For
example, this
line looks insanely
chopped.

10 Miscellaneous

superscript²
~~strikethrough~~

11 Let's talk about mixing R code with markdown

11.1 Getting to know your dataset

```
dim(iris)
```

```
## [1] 150 5
```

Number of rows

```
nrow(iris)
```

```
## [1] 150
```

Number of columns

```
ncol(iris)
```

```
## [1] 5
```

Names of variables

```
names(iris) # colnames(iris) also gives that information
```

```
## [1] "Sepal.Length" "Sepal.Width" "Petal.Length" "Petal.Width"  
## [5] "Species"
```

First 6 rows

```
head(iris)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1         5.1         3.5          1.4          0.2  setosa  
## 2         4.9         3.0          1.4          0.2  setosa  
## 3         4.7         3.2          1.3          0.2  setosa  
## 4         4.6         3.1          1.5          0.2  setosa  
## 5         5.0         3.6          1.4          0.2  setosa  
## 6         5.4         3.9          1.7          0.4  setosa
```

First 2 rows

```
head(iris,2) # alternately, can use iris[1:2,]
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1         5.1         3.5          1.4          0.2  setosa  
## 2         4.9         3.0          1.4          0.2  setosa
```

Last 6 rows

```
tail(iris) # Number of rows can be controlled, see earlier example involving the head command
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width  Species
## 145          6.7          3.3          5.7          2.5 virginica
## 146          6.7          3.0          5.2          2.3 virginica
## 147          6.3          2.5          5.0          1.9 virginica
## 148          6.5          3.0          5.2          2.0 virginica
## 149          6.2          3.4          5.4          2.3 virginica
## 150          5.9          3.0          5.1          1.8 virginica
```

First row

```
iris[1,]
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1          3.5          1.4          0.2  setosa
```

First row, first column

```
iris[1,1]
```

```
## [1] 5.1
```

Name of third column

```
names(iris)[3]
```

```
## [1] "Petal.Length"
```

3 entries from third column

```
head(iris[3],3) # alternately, can use iris[1:3,3]
```

```
##      Petal.Length
## 1          1.4
## 2          1.4
## 3          1.3
```

Structure of the dataframe (dataset)

```
str(iris)
```

```
## 'data.frame':   150 obs. of  5 variables:
## $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
## $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
## $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
## $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
## $ Species     : Factor w/ 3 levels "setosa","versicolor",...: 1 1 1 1 1 1 1 1 1 1 ...
```

Summary of the dataframe

```
summary(iris) # for factor/categorical variables, this gives a count of all categories
```

```
##      Sepal.Length      Sepal.Width      Petal.Length      Petal.Width
##  Min.      :4.300    Min.      :2.000    Min.      :1.000    Min.      :0.100
##  1st Qu.:5.100    1st Qu.:2.800    1st Qu.:1.600    1st Qu.:0.300
##  Median :5.800    Median :3.000    Median :4.350    Median :1.300
##  Mean   :5.843    Mean   :3.057    Mean   :3.758    Mean   :1.199
##  3rd Qu.:6.400    3rd Qu.:3.300    3rd Qu.:5.100    3rd Qu.:1.800
##  Max.   :7.900    Max.   :4.400    Max.   :6.900    Max.   :2.500
##      Species
##  setosa      :50
##  versicolor:50
##  virginica   :50
##
##
##
```

Create a dataframe

```
Person=c("A","B","C","D","E")
Age=c(15,20,25,30,35)
Height=c(60,63,75,79,56)
page=data.frame(Person,Age,Height)
mean(Age) # gives the mean of the variable Age, prior to the creation of the dataset
```

```
## [1] 25
```

```
Age="" # (resetting that)
mean(Age) # Haha
```

```
## Warning in mean.default(Age): argument is not numeric or logical: returning
## NA
```

```
## [1] NA
```

```
mean(page$Age)
```

```
## [1] 25
```

```
mean(page$Height)
```

```
## [1] 66.6
```

```
mean(page[,2])
```

```
## [1] 25
```

```
summary(page)
```

```
## Person      Age      Height
## A:1   Min.    :15   Min.    :56.0
## B:1   1st Qu.:20   1st Qu.:60.0
## C:1   Median :25   Median :63.0
## D:1   Mean   :25   Mean    :66.6
## E:1   3rd Qu.:30   3rd Qu.:75.0
##           Max.    :35   Max.    :79.0
```

```
plot(page$Person)
```

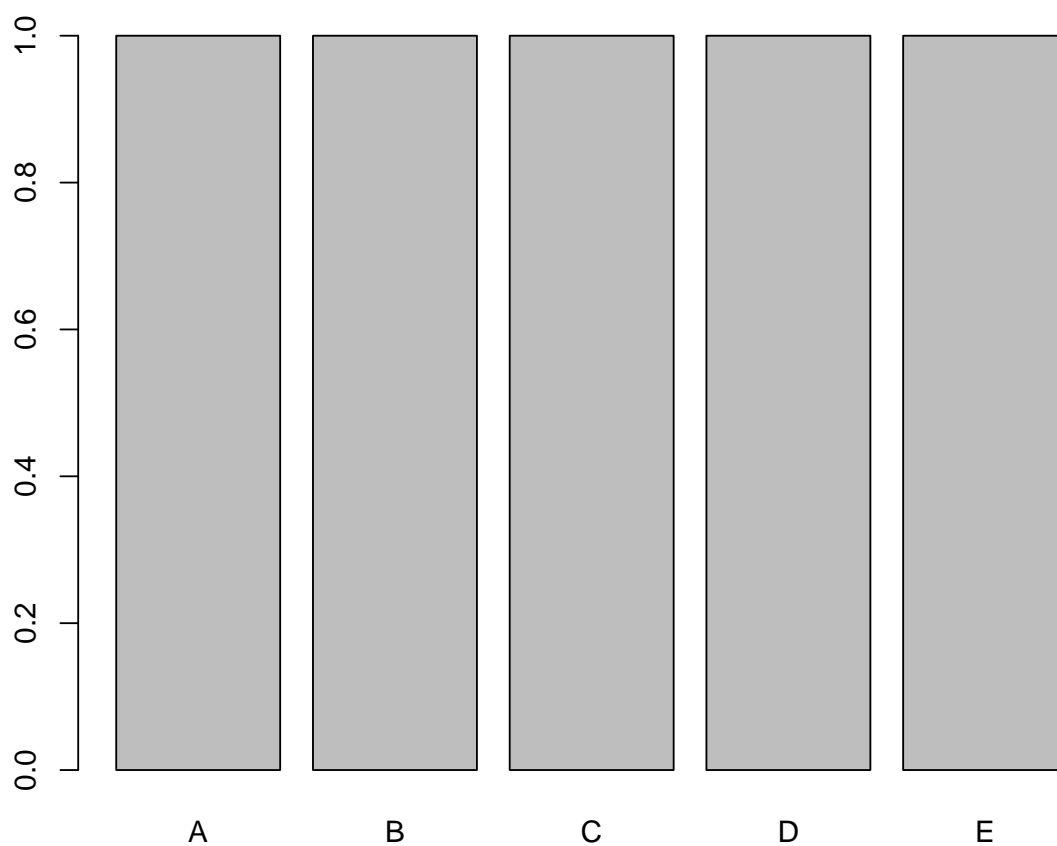


Figure 2: