RWorksheet#3a

Tamonan

2024-10-07

```
# 1. Using Vectors
# Built-in vectors: LETTERS contains uppercase letters and letters contains lowercase letters.
LETTERS
```

```
##  [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R" "S"
## [20] "T" "U" "V" "W" "X" "Y" "Z"
```

```
letters
```

```
##  [1] "a" "b" "c" "d" "e" "f" "g" "h" "i" "j" "k" "l" "m" "n" "o" "p" "q" "r" "s"
## [20] "t" "u" "v" "w" "x" "y" "z"
```

```
# 1.a Produce a vector that contains the first 11 letters.
first_11_letters <- LETTERS[1:11]
first_11_letters
```

```
##  [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K"
```

```
# 1.b Produce a vector that contains the odd-numbered letters.
odd_letters <- LETTERS[seq(1, 26, 2)]
odd_letters
```

```
##  [1] "A" "C" "E" "G" "I" "K" "M" "O" "Q" "S" "U" "W" "Y"
```

```
# 1.c Produce a vector that contains the vowels.
vowels <- LETTERS[c(1, 5, 9, 15, 21)]
vowels
```

```
## [1] "A" "E" "I" "O" "U"
```

```
# 1.d Produce a vector that contains the last 5 lowercase letters.
last_5_lowercase <- letters[22:26]
last_5_lowercase
```

```
## [1] "v" "w" "x" "y" "z"
```

```r
# 1.e Produce a vector that contains lowercase letters from 15th to 24th.
lowercase_15_to_24 <- letters[15:24]
lowercase_15_to_24
```

```
##  [1] "o" "p" "q" "r" "s" "t" "u" "v" "w" "x"
```

```r
# 2. Create a vector(not a dataframe) with the average temperatures in April for Tuguegarao City, Manil
# 2.a Create a character vector for city names
city <- c("Tuguegarao City", "Manila", "Iloilo City", "Tacloban", "Samal Island", "Davao City")
city
```

```
## [1] "Tuguegarao City" "Manila"          "Iloilo City"     "Tacloban"
## [5] "Samal Island"    "Davao City"
```

```r
# 2.b Create a numeric vector for temperatures
temp <- c(42, 39, 34, 34, 30, 27)
temp
```

```
## [1] 42 39 34 34 30 27
```

```r
# 2.c Create a dataframe from city and temperature
city_temp_df <- data.frame(City = city, Temperature = temp)
city_temp_df
```

```
##              City Temperature
## 1 Tuguegarao City          42
## 2          Manila          39
## 3     Iloilo City          34
## 4        Tacloban          34
## 5    Samal Island          30
## 6      Davao City          27
```

```r
# 2.d Rename the columns
names(city_temp_df) <- c("City", "Temperature")
city_temp_df
```

```
##              City Temperature
## 1 Tuguegarao City          42
## 2          Manila          39
## 3     Iloilo City          34
## 4        Tacloban          34
## 5    Samal Island          30
## 6      Davao City          27
```

```r
# 2.e Print the structure of the dataframe
str(city_temp_df)
```

```
## 'data.frame':    6 obs. of  2 variables:
##  $ City       : chr  "Tuguegarao City" "Manila" "Iloilo City" "Tacloban" ...
##  $ Temperature: num  42 39 34 34 30 27
```

```r
# 2.f Get the content of row 3 and 4
city_temp_df[3:4, ]
```

```
##          City Temperature
## 3 Iloilo City          34
## 4    Tacloban          34
```

```r
# 2.g Display the city with the highest and lowest temperature
highest_temp_city <- city_temp_df[which.max(city_temp_df$Temperature), ]
lowest_temp_city <- city_temp_df[which.min(city_temp_df$Temperature), ]
highest_temp_city
```

```
##              City Temperature
## 1 Tuguegarao City          42
```

```r
lowest_temp_city
```

```
##         City Temperature
## 6 Davao City          27
```

```r
# 3. Using Matrices
# 3.a Create a matrix from 1 to 8 and 11 to 14 with 4 columns and 3 rows
matrix_data <- matrix(c(1:8, 11:14), nrow = 3, ncol = 4)
matrix_data
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    4    7   12
## [2,]    2    5    8   13
## [3,]    3    6   11   14
```

```r
# 3.b Multiply the matrix by 2
matrix_mult_2 <- matrix_data * 2
matrix_mult_2
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    2    8   14   24
## [2,]    4   10   16   26
## [3,]    6   12   22   28
```

```r
# 3.c Display the content of row 2
matrix_data[2, ]
```

```
## [1]  2  5  8 13
```

```r
# 3.d Display column 3 and column 4 in row 1 and row 2
matrix_data[1:2, 3:4]
```

```
##      [,1] [,2]
## [1,]    7   12
## [2,]    8   13
```

```r
# 3.e Display columns 2 and 3 in row 3
matrix_data[3, 2:3]
```

```
## [1]  6 11
```

```r
# 3.f Display only column 4
matrix_data[, 4]
```

```
## [1] 12 13 14
```

```r
# 3.g Name the rows and columns of the matrix
rownames(matrix_mult_2) <- c("isa", "dalawa", "tatlo")
colnames(matrix_mult_2) <- c("uno", "dos", "tres", "quatro")
matrix_mult_2
```

```
##        uno dos tres quatro
## isa      2   8   14     24
## dalawa   4  10   16     26
## tatlo    6  12   22     28
```

```r
# 3.h Reshape the matrix to 2 columns and 6 rows
dim(matrix_data) <- c(6, 2)
matrix_data
```

```
##      [,1] [,2]
## [1,]    1    7
## [2,]    2    8
## [3,]    3   11
## [4,]    4   12
## [5,]    5   13
## [6,]    6   14
```

```r
# 4. Using Arrays
# 4.a Create a 3D array with 4 columns, 2 rows, and repeating values
array_data <- array(rep(c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1), 2), dim = c(2, 4, 3))
array_data
```

```
## , , 1
##
##      [,1] [,2] [,3] [,4]
## [1,]    1    3    7    9
## [2,]    2    6    8    0
##
## , , 2
##
##      [,1] [,2] [,3] [,4]
## [1,]    3    5    1    3
## [2,]    4    1    2    6
##
## , , 3
```

```
##
##      [,1] [,2] [,3] [,4]
## [1,]    7    9    3    5
## [2,]    8    0    4    1
```

```
# 4.b Check the dimensions of the array
dim(array_data)
```

```
## [1] 2 4 3
```

```
# 4.c Name the rows and columns of the array
rownames <- letters[1:2]
colnames <- LETTERS[1:4]
dimnames(array_data) <- list(rownames, colnames, c("1st-Dimensional Array", "2nd-Dimensional Array", "3r
array_data
```

```
## , , 1st-Dimensional Array
##
##   A B C D
## a 1 3 7 9
## b 2 6 8 0
##
## , , 2nd-Dimensional Array
##
##   A B C D
## a 3 5 1 3
## b 4 1 2 6
##
## , , 3rd-Dimensional Array
##
##   A B C D
## a 7 9 3 5
## b 8 0 4 1
```

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

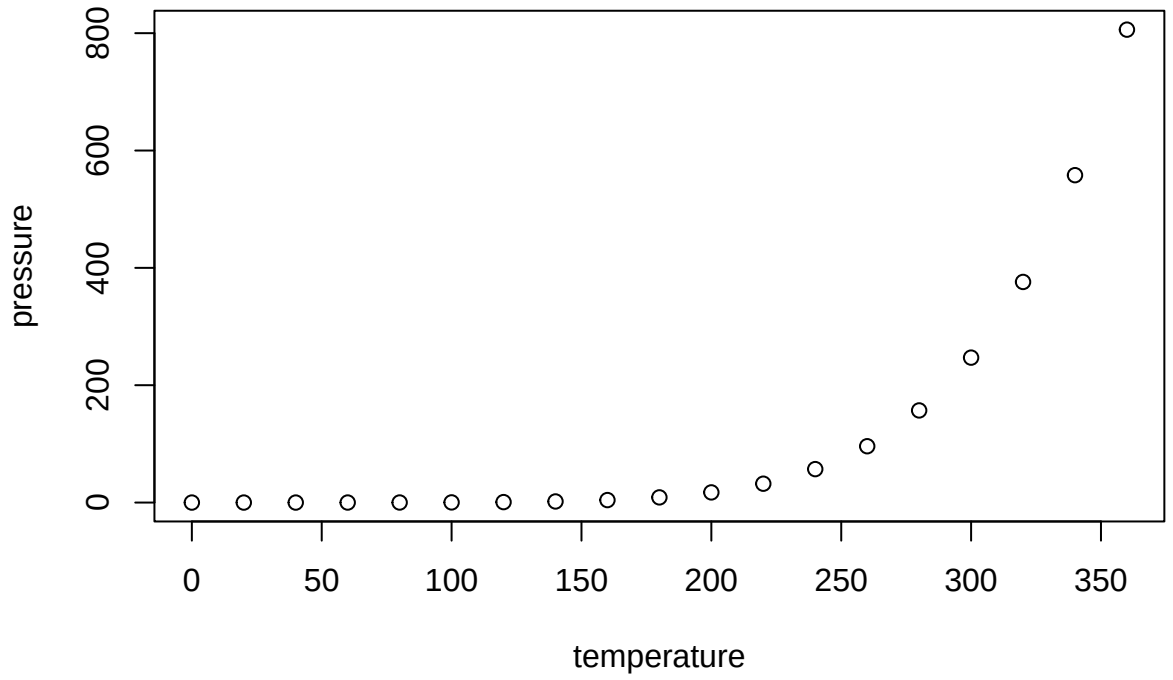
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.