RWorksheet-3_Amuan#3A

2023-10-13

```
#USING VECTORS



#1. There is a built-in vector LETTERS contains the uppercase letters of the alphabet and letters which

#LETTERS

     print(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"
```

```
     print(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. You need to produce a vector that contains the first 11 letters.

     aVector <- LETTERS [1:11]
     aVector
```

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

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

#1.B. Produce a vector that contains the odd numbered letters.

    odd_numbers <- c(1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25)

     aVector <- LETTERS [odd_numbers]
     aVector
```

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

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

#1.C. Produce a vector that contains the vowels

     vowels <- c(1,5,9,15)

     aVector <- LETTERS [vowels]
     aVector
```

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

```
#OUTPUT = [1] "A" "E" "I" "O"

#1.D. Produce a vector that contains the last 5 lowercase letters.

     aVector <- letters[21:26]
     aVector
```

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

```
#OUTPUT = [1] "u" "v" "w" "x" "y" "z"

#1.E. Produce a vector that contains letters between 15 to 24 letters in lowercase.

    aVector <- letters[15:24]
    aVector
```

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

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

#Create a vector(not a dataframe) with the average temperatures in April for Tugue-garao City, Manila,

#2.A What is the R code and its result for creating a character vector for the city/town?

    Cities <- c("Tuguegarao City", "Manila", "Iloilo City",               "Tacloban", "Samal Island",
    Cities
```

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

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

#2.B The average temperatures.

    Temp <- c(42,39,34,34,30,27)
    Temp
```

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

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

#3.C Create a dataframe to combine the city and the temp.

    cityTemp <- data.frame(Cities, Temp)
    cityTemp
```

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

```
#OUTPUT:    Cities   Temp
#1 Tuguegarao City   42
#2          Manila   39
```

```
#3     Iloilo City   34
#4        Tacloban   34
#5    Samal Island   30
#6      Davao City   27

#3.D Associate the dataframe you have created in 2.

      names(Cities) <- c("Cities", "Temperature")
      cityTemp
```

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

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

#3.E Print the structure by using str() function. Describe the output.

      str(cityTemp)
```

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

```
#DESCRIPTION & OUTPUT: #'data.frame':   6 obs. of  2 variables:, This shows that the data frame have 6
# $ Cities: chr  "Tuguegarao City" "Manila" "Iloilo City" "Tacloban" ...
#$ Temp  : num  42 39 34 34 30 27
#This shows the Temperature column and indicate that it is a numeric variable.

#3.F From the answer in d, what is the content of row 3 and row 4 What is its R code and its output?

      content <- cityTemp[3:4,]
      content
```

```
##        Cities Temp
## 3 Iloilo City   34
## 4    Tacloban   34
```

```
#OUTPUT: Cities Temp
#3 Iloilo City   34
#4    Tacloban   34

#3.G From the answer in d, display the city with highest temperature and the city with the lowest tempe

#lowesTemperature
```

```
        lowestTemp <- cityTemp[which.max(cityTemp$Temp),]
        lowestTemp
```

```
##            Cities Temp
## 1 Tuguegarao City   42
```

```
#OUTPUT: Cities Temp
#1 Tuguegarao City   42

#highestTemperature

        highestTemp <- cityTemp[which.max(cityTemp$Temp),]
        highestTemp
```

```
##            Cities Temp
## 1 Tuguegarao City   42
```

```
#OUTPUT: Cities Temp
#1 Tuguegarao City   42


#USING MATRICES
#2. Create a matrix of one to eight and eleven to fourteen with four columns and three rows.
#2.A What will be the R code for the #2 question and its result?

      matrix <- matrix (c(1:8, 11:14), nrow = 3, ncol = 4)
      matrix
```

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

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

#2.B Multiply the matrix by two. What is its R code and its result?

      matrixTwo <- matrix * 2
      matrixTwo
```

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

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

#2. c. What is the content of row 2? What is its R code?

      matrixTwo[2]
```

```
## [1] 4
```

```
#OUTPUT: [1] 4

#2. D. What will be the R code if you want to display the column 3 and column 4 in row 1 and row 2? Wha

      matrixTwo [1:2, 3:4]
```

```
##      [,1] [,2]
## [1,]   14   24
## [2,]   16   26
```

```
#OUTPUT:[,1] [,2]
#[1,]   14   24
#[2,]   16   26

#2.E What is the R code is you want to display only the columns in 2 and 3, row 3? What is its output?

    matrixTwo[3, 2:3]
```

```
## [1] 12 22
```

```
#OUTPUT: [1] 12 22

#2.F What is the R code is you want to display only the columns 4? What is its output?

    matrixTwo[,4]
```

```
## [1] 24 26 28
```

```
#OUTPUT: [1] 24 26 28

#2.G Name the rows as isa, dalawa, tatlo and columns as uno, dos, tres, quatro for the matrix that was
#What is its R code and corresponding output?

    dimnames(matrixTwo) <- list(c("isa", "dalawa", "tatlo"), c("uno",         "dos", "tres", "quatro"))
    matrixTwo
```

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

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

#2.H From the original matrix you have created in a, reshape the matrix by assigning a new dimension wi
#What will be the R code and its output?

    dim(matrix) <- c(6,2)
    matrix
```

```
##      [,1] [,2]
## [1,]    1    7
## [2,]    2    8
## [3,]    3   11
```

```
## [4,]    4   12
## [5,]    5   13
## [6,]    6   14
```

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

#USING ARRAYS

#3. An array contains 1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1
#3. A Create an array for the above numeric values. Each values will be repeated twice
#What will be the R code if you are to create a three-dimensional array with 4 columns and 2 rows. What

    numVal <- c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1)

#TWICE

      repTwice <- rep(numVal, each = 2)
      repTwice
```

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

```
      array <- array(repTwice, dim = c(2,4,3))
      array
```

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

```
#OUTPUT: , , 1

#[,1] [,2] [,3] [,4]
#[1,]    1    2    3    6
#[2,]    1    2    3    6

#, , 2
```

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

#, , 3

#[,1] [,2] [,3] [,4]
#[1,]    3    4    5    1
#[2,]    3    4    5    1

#2.B How many dimensions do your array have?
# IT HAS THREE (3) DIMENSIONS.

#Name the rows as lowercase letters and columns as uppercase letters starting from the A. The array nam
#What will be the R codes and its output?

      dimnames(array) <- list(
       row_names <- letters[1:2],
       col_names <- LETTERS[1:4], c("1st-Dimensional Array", "2nd-Dimensional Array", "3rd-Dimensional A
      array
```

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

```
#OUPUT:
#, , 1st-Dimensional Array

#A B C D
#a 1 2 3 6
#b 1 2 3 6

#, , 2nd-Dimensional Array

#A B C D
#a 7 8 9 0
#b 7 8 9 0

#, , 3rd-Dimensional Array
```

```
#A B C D
#a 3 4 5 1
#b 3 4 5 1
```