

Saint Joy A. Mandalinao BSDS 2
2023-11993
2/11/2025

Exercise 1 (Data Organization and Visualizations in R)

Exercise 1a. Write a code to create a matrix similar to the one shown below, using three original arrays: array1, array2, and array3. The rst array contains 8 elements, and the second contains 4 elements. Ensure the matrix follows the given row and column variables and name it "A Matrix".

Code

The screenshot shows the RStudio interface. The script editor contains the following code:

```
1 #Saint Joy A. Mandalinao
2 #BSDS 2
3 #2023-11993
4 #02/11/2025
5
6 # Define three arrays with different numbers of elements
7 array1 <- c(10, 34, 67, 23, 89, 5, 12, 45) # 8 elements
8 array2 <- c(7, 54, 19, 88) # 4 elements
9 array3 <- c(32, 76, 9, 28, 41, 14, 3, 11) # 8 elements
10
11
12 # Assign column and row names for the matrix
13 column_names <- c("w", "x", "y", "z") # Column labels
14 row_names <- c("a", "b", "c", "d", "e") # Row labels
15 matrix_name <- c("A Matrix") # Name of the matrix
16
17 # Create a 3D array with dimensions (5 rows, 4 columns, 1 layer)
18 matrix_A <- array(c(array1, array2, array3),
19 dim = c(5, 4, 1),
20 dimnames = list(row_names, column_names, matrix_name))
21
22 # Print the array
23 print(matrix_A)
```

The Environment pane shows the following variables:

Variable	Value
array1	num [1:8] 10 34 67 23 89 5 12 45
array2	num [1:4] 7 54 19 88
array3	num [1:8] 32 76 9 28 41 14 3 11
column_names	chr [1:4] "w" "x" "y" "z"
matrix_A	num [1:5, 1:4, 1] 10 34 67 23 89 5 12 45 7 54 ...
matrix_name	"A Matrix"
row_names	chr [1:5] "a" "b" "c" "d" "e"

The Console shows the output of the code:

```
> # Create a 3D array with dimensions (5 rows, 4 columns, 1 layer)
> matrix_A <- array(c(array1, array2, array3),
+ dim = c(5, 4, 1),
+ dimnames = list(row_names, column_names, matrix_name))
> # Print the array
> print(matrix_A)
, , A Matrix
   w  x  y  z
a 10 34 67 23
b 34 12 88 41
c 67 45 32 14
d 23 7 76 3
e 89 54 9 11
```

Console and Environment

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```
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2 #BSDS 2
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```

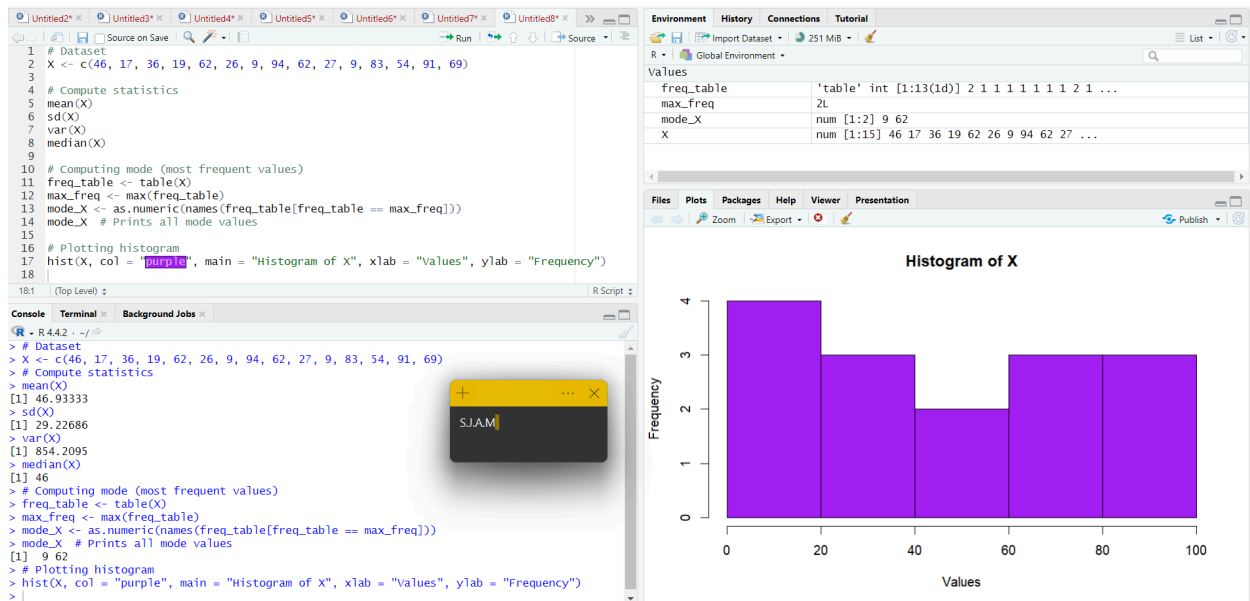
The Environment pane shows the following variables:

Variable	Value
array1	num [1:8] 10 34 67 23 89 5 12 45
array2	num [1:4] 7 54 19 88
array3	num [1:8] 32 76 9 28 41 14 3 11
column_names	chr [1:4] "w" "x" "y" "z"
matrix_A	num [1:5, 1:4, 1] 10 34 67 23 89 5 12 45 7 54 ...
matrix_name	"A Matrix"
row_names	chr [1:5] "a" "b" "c" "d" "e"

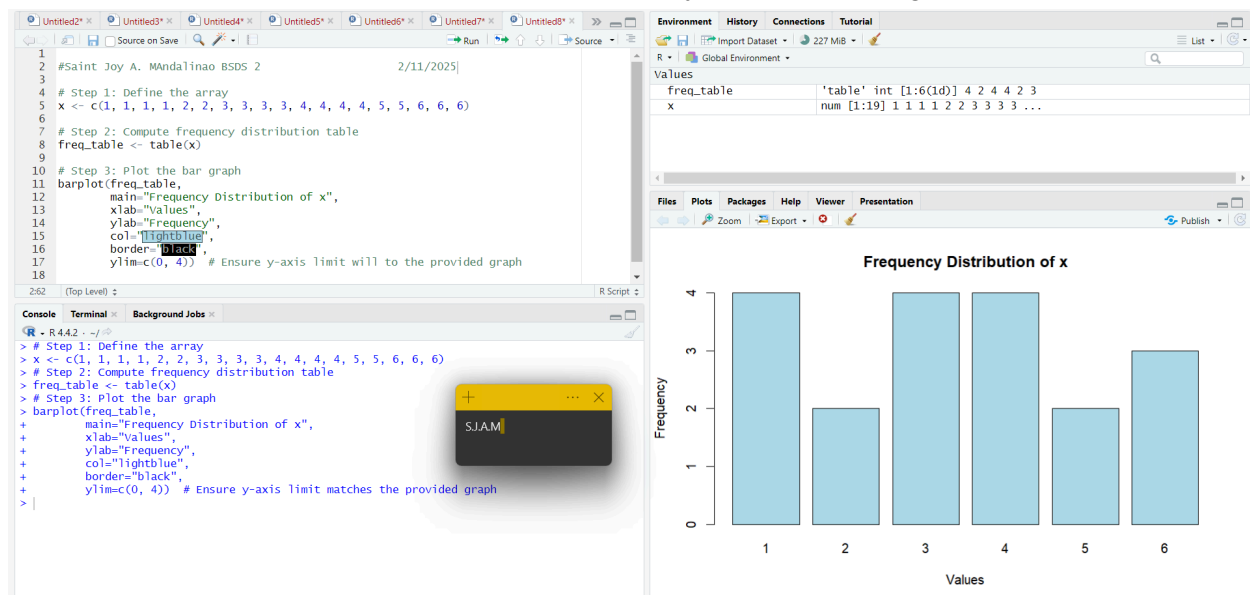
The Console shows the output of the code:

```
> # Define three arrays with different numbers of elements
> array1 <- c(10, 34, 67, 23, 89, 5, 12, 45) # 8 elements
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> # Assign column and row names for the matrix
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> # Create a 3D array with dimensions (5 rows, 4 columns, 1 layer)
> matrix_A <- array(c(array1, array2, array3),
+ dim = c(5, 4, 1),
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> # Print the array
> print(matrix_A)
, , A Matrix
   w  x  y  z
a 10 34 67 23
b 34 12 88 41
c 67 45 32 14
d 23 7 76 3
e 89 54 9 11
```

Exercise 1b Write a code to compute the mean, median, mode, variance, and standard deviation of the following dataset. $X = \{46, 17, 36, 19, 62, 26, 9, 94, 62, 27, 9, 83, 54, 91, 69\}$

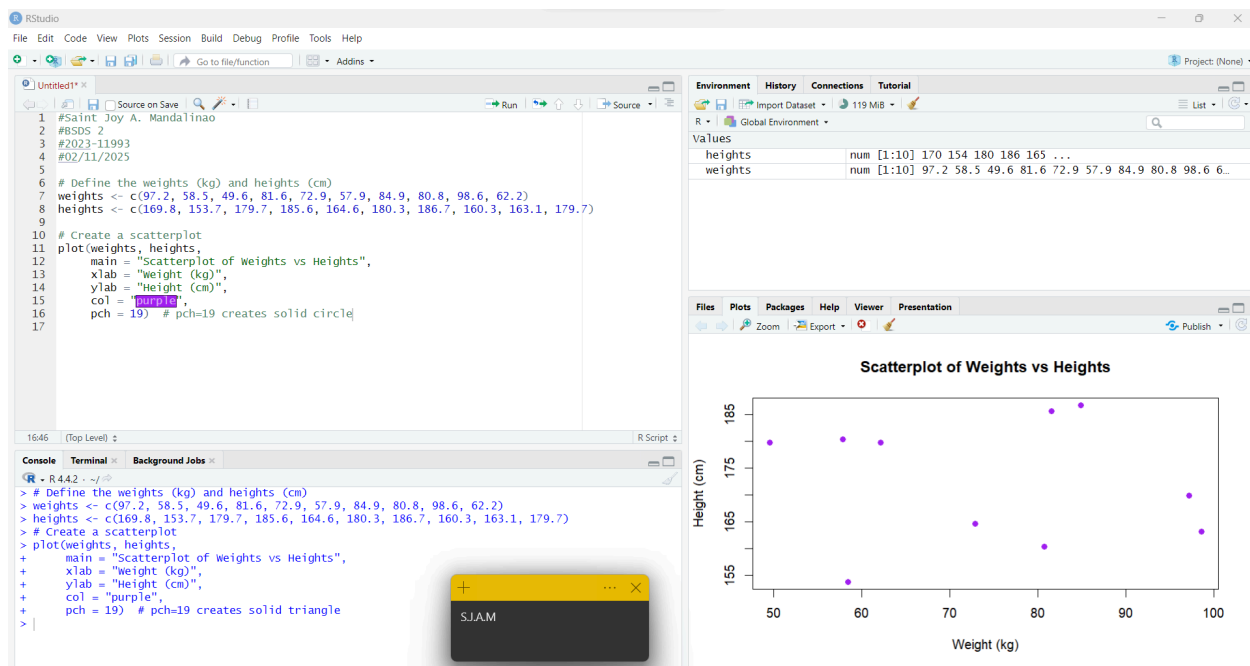


Exercise 1c Write a code to implement the frequency distribution bar graph below.



Exercise 1d Generate a scatterplot using the data provided below:

- Weights (kg): 97.2, 58.5, 49.6, 81.6, 72.9, 57.9, 84.9, 80.8, 98.6, 62.2
- Heights (cm): 169.8, 153.7, 179.7, 185.6, 164.6, 180.3, 186.7, 160.3, 163.1, 179.7



Exercise 1e. Write a code to plot a time series for the monthly average sales of a restaurant for the year 2024. Feel free to generate random sales values.

