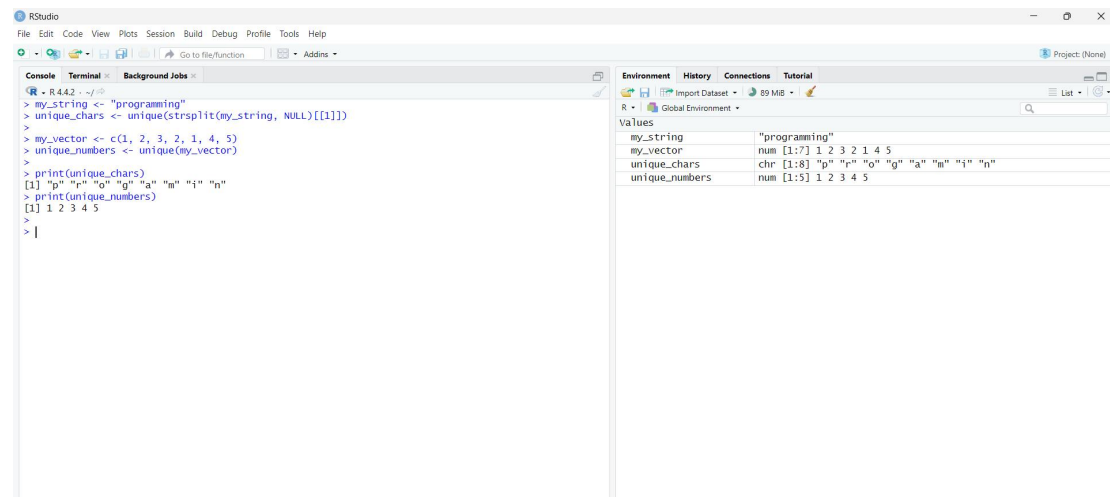


LAB 4

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1. Write a R program to get the unique elements of a given string and unique numbers of vector



```
R - R4.4.2 - ~/j
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Console Terminal Background Jobs
> my_string <- "programming"
> unique_chars <- unique(strsplit(my_string, NULL)[[1]])
>
> my_vector <- c(1, 2, 3, 2, 1, 4, 5)
> unique_numbers <- unique(my_vector)
>
> print(unique_chars)
[1] "p" "r" "o" "g" "a" "m" "i" "n"
> print(unique_numbers)
[1] 1 2 3 4 5
>
> |
```

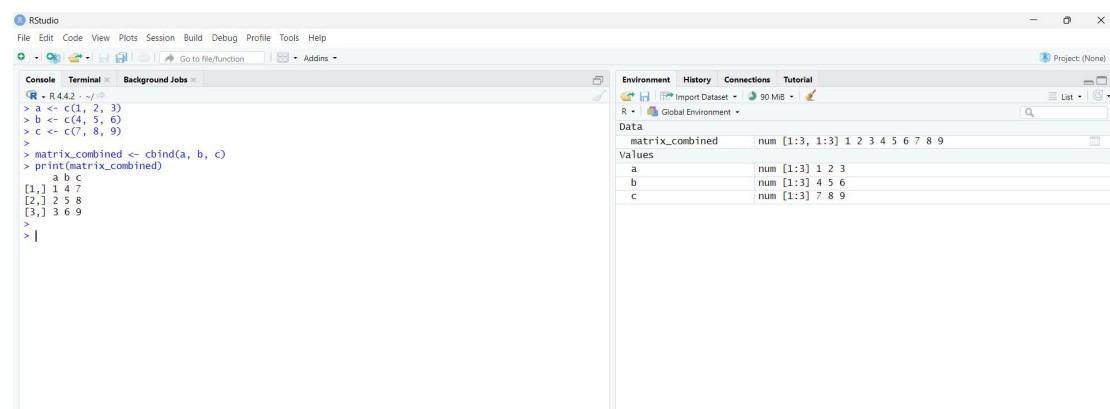
Environment History Connections Tutorial

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Values

my_string	"programming"
my_vector	num [1:7] 1 2 3 2 1 4 5
unique_chars	chr [1:8] "p" "r" "o" "g" "a" "m" "i" "n"
unique_numbers	num [1:5] 1 2 3 4 5

2. Write a R program to create three vectors a,b,c with 3 integers. Combine the three vectors to become a 3×3 matrix where each column represents a vector. Print the content of the matrix.



```
R - R4.4.2 - ~/j
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Console Terminal Background Jobs
> a <- c(1, 2, 3)
> b <- c(4, 5, 6)
> c <- c(7, 8, 9)
>
> matrix_combined <- cbind(a, b, c)
> print(matrix_combined)
      a b c
[1,] 1 4 7
[2,] 2 5 8
[3,] 3 6 9
>
> |
```

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Data

matrix_combined	num [1:3, 1:3] 1 2 3 4 5 6 7 8 9

Values

a	num [1:3] 1 2 3
b	num [1:3] 4 5 6
c	num [1:3] 7 8 9

3. Write a R program to create a list of random numbers in normal distribution and count occurrences of each value.

```

R - R 4.4.2 - ~/R
> set.seed(123)
> random_numbers <- rnorm(100, mean = 0, sd = 1)
> occurrences <- table(random_numbers)
> print(occurrences)
random_numbers
-2.30916887564081 -1.96661715662964 -1.68669331074241 -1.54875280423022
-1.26539635156826 -1.26506123460653 -1.22071771225454 -1.13813693701195
-1.12310858320335 -1.07179122647558 -1.06782370598685 -1.02642090030678
-1.02600444830724 -1.01857538310709 -0.72889122929114 -0.709200762582393
-0.694706978920513 -0.688008616467358 -0.686852851893526 -0.627906076039371
-0.625039267849257 -0.600259587147127 -0.560475646552213 -0.555841134754075
-0.502323453109302 -0.491031166056535 -0.472791407727934 -0.466655353623219
-0.445661970099958 -0.402884835299076 -0.380471001012383 -0.370660031792409
-0.33320738366942 -0.325931585531227 -0.305962663739917 -0.295071482992271
-0.284773007051009 -0.235700359100477 -0.23017748948328 -0.225770985659268
-0.220486561818751 -0.217974914658295 -0.207917278019599 -0.138891362439045
-0.0833690664718293 -0.0619117105767217 -0.0428704572913161 -0.028546755348703
0.00576418589888693 0.0530042267305041 0.070508391424576 0.11068271594512
0.123854243844614 0.129287735160946 0.153373117836515 0.18130347974915
0.215941568743973 0.238731735111441 0.253318513994755 0.303528641404258

```

The screenshot shows the RStudio interface. The console on the left displays the R code and the output of the `print(occurrences)` command, which shows a table of random numbers. The Environment pane on the right shows the variables `occurrences` and `random_numbers` with their respective data types and values.

4. Write a R program to create three vectors numeric data, character data and logical data. Display the content of the vectors and their type

```

R - R 4.4.2 - ~/R
> numeric_data <- c(1, 2, 3, 4, 5)
> character_data <- c("apple", "banana", "cherry", "date", "elderberry")
> logical_data <- c(TRUE, FALSE, TRUE, FALSE, TRUE)
> 
> print(numeric_data)
[1] 1 2 3 4 5
> print(typeof(numeric_data))
[1] "double"
> 
> print(character_data)
[1] "apple" "banana" "cherry" "date" "elderberry"
> print(typeof(character_data))
[1] "character"
> 
> print(logical_data)
[1] TRUE FALSE TRUE FALSE TRUE
> print(typeof(logical_data))
[1] "logical"
> 
> |

```

The screenshot shows the RStudio interface. The console on the left displays the R code to create three vectors: `numeric_data` (numeric), `character_data` (character), and `logical_data` (logical). The Environment pane on the right shows the variables `character_data`, `logical_data`, and `numeric_data` with their respective data types and values.