Lab 02 - Numerical Computing

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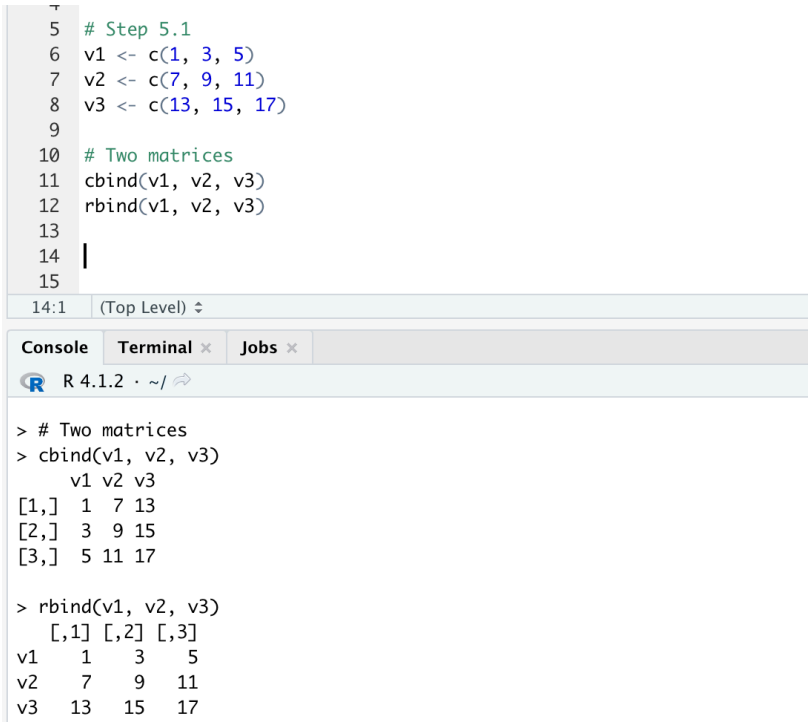
1. Screenshot(s) for the two matrices created in Step 5.1



```
# Step 5.1
v1 <- c(1, 3, 5)
v2 <- c(7, 9, 11)
v3 <- c(13, 15, 17)

# Two matrices
cbind(v1, v2, v3)
rbind(v1, v2, v3)

14:1  (Top Level)

Console  Terminal  Jobs
R 4.1.2 · ~/

> # Two matrices
> cbind(v1, v2, v3)
     v1 v2 v3
[1,]  1  7 13
[2,]  3  9 15
[3,]  5 11 17

> rbind(v1, v2, v3)
   [,1] [,2] [,3]
v1    1    3    5
v2    7    9   11
v3   13   15   17
```

2. Screenshot(s) for the data frame created in Step 5.2
    1. The screenshot must contain
        1. at least 7 students
        2. the same columns and names as the sample screenshot provided
        3. the console or script code that generated the data frame

```r
# Step 5.2
STUDENT <- data.frame(
  Name = c("Adam D", "Hubert F", "John D", "Jane D", "Michael S", "Dwight S", "Joe B"),
  Gender = c("M", "M", "M", "F", "M", "M", "F"),
  StuID = c(435323, 324432, 461353, 146321, 420912, 124144, 190294),
  Program = c("CET", "CP", "CET", "CP", "CET", "CET", "CET"),
  NumCourses = c(2, 4, 2, 5, 1, 3, 7)
)

print(STUDENT)
```

24:1 (Top Level) R Script

Console Terminal Jobs

R 4.1.2 · ~/

```
> 
> # Step 5.2
> STUDENT <- data.frame(
+   Name = c("Adam D", "Hubert F", "John D", "Jane D", "Michael S", "Dwight S", "Joe B"),
+   Gender = c("M", "M", "M", "F", "M", "M", "F"),
+   StuID = c(435323, 324432, 461353, 146321, 420912, 124144, 190294),
+   Program = c("CET", "CP", "CET", "CP", "CET", "CET", "CET"),
+   NumCourses = c(2, 4, 2, 5, 1, 3, 7)
+ )
> print(STUDENT)
       Name Gender  StuID Program NumCourses
1    Adam D      M 435323     CET          2
2  Hubert F      M 324432      CP          4
3    John D      M 461353     CET          2
4    Jane D      F 146321      CP          5
5 Michael S      M 420912     CET          1
6  Dwight S      M 124144     CET          3
7     Joe B      F 190294     CET          7
```

3. Answers to the following questions
    1. What is one key difference between matrices and arrays?

Matrices or a singular matrix is a multi dimensional array combined with multiple arrays as shown in step 5.1. It can be arranged by rows or columns.

    2. Questions from Step 1:
        1. What does [13] indicate?

The first row has a [1] because the vector is starting at the first index in the array and because the line gets cut off [13] is the new lines starting index.

        2. What does ":" operator do?

The colon is used as a range syntax so you put the start and the end number with the colon in between to initialize the array of integers.

    3. What are the 6 classes of R objects?

Character, Numeric, Integer, Complex, Logical, and Raw

    4. What are the 6 main R objects that you learned about in this lab?

Vector, Lists, Matrices, Arrays, Factors, Data Frames