Data Science - Practice 1 (R Basic I)

Make sure you not only just "write down" the R code but also "explain the answer with your own language". All answers without explanation will not be accepted.

Problem

Handong Global University students' favorite football teams are Manchester United, Manchester City, Tottenham, PSG, Barcelona, Real Madrid, FC Wonderwoman, and FC Topgirl. We will practice what we have learned so far through the listed football clubs. (If you have NA values, exclude them).

< Question 1 >

(10 pts) Create a new vector (name of vector = 'fc') with the following teams: Manchester United, Manchester City, Tottenham, FC JYP, PSG, Barcelona, Real Madrid, FC Wonderwoman.

Expected Result

```
> fc
[1] "Manchester United" "Manchester City"   "Tottenham"         "FC JYP"
[5] "PSG"               "Barcelona"         "Real Madrid"       "FC Wonderwoman"
```

< Question 2 >

(10 pts) For those football team, Sonny rated based on his preference as follows: Manchester United - 4.8, Manchester City - 0, Tottenham - 5, FC JYP – NA, PSG – 4.1, Barcelona – 3.2, Real Madrid – 3.8, FC Wonderwoman – 4.9. Here, he assigned NA values to team that he has never heard of. Using this information, create a vector called "my_rating".

Expected Result

```
> my_rating
[1] 4.8 0.0 5.0  NA 4.1 3.2 3.8 4.9
```

< Question 3 >

(10 pts) FIFA's rating on those teams are '3.4, 4.8, 2.7, NA, 4.7, 4.1, 3.8, NA' respectively. Create a new vector ('fifa_rating') with these values.

Expected Result

```
> fifa_rating
[1] 3.4 4.8 2.7  NA 4.7 4.1 3.8  NA
```

< Question 4 >

(10 pts) Create your team member's own rating vector. Then, create a new matrix ('team_rating') including all the rating vectors you and your teammates have made so far. Below is the example of team_rating with three members.

Expected Result

```
> team_rating
     [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8]
[1,]  4.8  0.0  5.0   NA  4.1  3.2  3.8  4.9
[2,]  1.3  4.2  4.3   NA  4.1  3.2  3.6  4.1
[3,]  4.8  0.8  1.1   NA  1.4  4.4  2.2   NA
```

< Question 5 >

(10 pts) Create a new vector ('stu_mean') by calculating each student's average team rating.

Expected Result

```
> stu_mean
[1] 3.685714 3.542857 2.450000
```

< Question 6 >

(10 pts) Create a new vector ('team_sum') by calculating the summation of each movie's rating.

Expected Result

```
> team_sum
[1] 10.9  5.0 10.4  0.0  9.6 10.8  9.6  9.0
```

< Question 7 >

(10 pts) Create the new vector('team_matrix_ed'), which adds the vector that you have created in question 5 ('stu_mean') to the last column of the matrix you have created in question 4 ('team_rating').

Expected Result

```
> team_matrix_ed
                                    stu_mean
[1,] 4.8 0.0 5.0 NA 4.1 3.2 3.8 4.9 3.685714
[2,] 1.3 4.2 4.3 NA 4.1 3.2 3.6 4.1 3.542857
[3,] 4.8 0.8 1.1 NA 1.4 4.4 2.2  NA 2.450000
```

< Question 8 >

(10 pts) Add the vector that you have created in question 6 ('team_sum') to the last row of the matrix you have created in question 7 ('team_matrix_ed'). The length of vector is different from the number of columns of matrix. what happen when you put combine them with rbind command?

Expected Result

```
                                          stu_mean
          4.8 0.0  5.0 NA 4.1  3.2 3.8 4.9  3.685714
          1.3 4.2  4.3 NA 4.1  3.2 3.6 4.1  3.542857
          4.8 0.8  1.1 NA 1.4  4.4 2.2  NA  2.450000
team_sum 10.9 5.0 10.4  0 9.6 10.8 9.6 9.0 10.900000
```

< Question 9 >

(10 pts) The matrix's last row's last column you have created in question 8 (the value equivalent to '10.9' in the example) is not a meaningful value. Hence, convert the value to 'NA'.

Expected Result

```
                                                stu_mean
          4.8 0.0  5.0 NA 4.1  3.2 3.8 4.9 3.685714
          1.3 4.2  4.3 NA 4.1  3.2 3.6 4.1 3.542857
          4.8 0.8  1.1 NA 1.4  4.4 2.2  NA 2.450000
team_sum 10.9 5.0 10.4  0 9.6 10.8 9.6 9.0       NA
```

< Question 10 >

(10 pts) For an intuitive understanding of the matrix, it is recommended to name the rows and columns. Hence, assign the rows and columns to the students' names and the football teams' names respectively. Assign this matrix to a variable called "team_matrix_ed_1".

Expected Result

```
> team_matrix_ed_1
         Manchester United Manchester City Tottenham FC JYP PSG Barcelona Real Madrid FC Wonderwoman stu_mean
Kim                    4.8             0.0          5.0  NA 4.1       3.2          3.8          4.9 3.685714
Lee                    1.3             4.2          4.3  NA 4.1       3.2          3.6          4.1 3.542857
Park                   4.8             0.8          1.1  NA 1.4       4.4          2.2           NA 2.450000
team_sum              10.9             5.0         10.4   0 9.6      10.8          9.6          9.0       NA
```

< Question 11 >

(10 pts) From team_matrix_ed_1, extract only the student's information.

Expected Result

```
     Manchester United Manchester City Tottenham FC JYP PSG Barcelona Real Madrid FC Wonderwoman stu_mean
Kim                 4.8             0.0          5.0  NA 4.1       3.2          3.8          4.9 3.685714
Lee                 1.3             4.2          4.3  NA 4.1       3.2          3.6          4.1 3.542857
Park                4.8             0.8          1.1  NA 1.4       4.4          2.2           NA 2.450000
```