	Introduction à l'analyse de données Mme Nada SBIHI	**Année Universitaire** 2020/2021

الجامـــــــة الدوليـــــــة للربـــــــاط
ⵜⴰⵙⴷⴰⵡⵉⵜ ⵜⴰⴳⵍⴷⵓⵏⵜ ⵏ ⵕⵕⴱⴰⵟ
Université Internationale de Rabat
ANS L'UNIVERSITÉ INNOVANTE

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Compte Rendu
Lab1 : Introduction to **R**

```
 1  #Examples
 2  5+5
 3  5-5
 4  5*5
 5  5/5
 6  5^2
 7  10%%4
 8  |
 9  numeric_vector <-c(1,10,49)  #stocker les variables dans le vecteur
10  print(numeric_vector) #afficher le contenu du vecteur
```

Console :

```
> 5+5
[1] 10
> 5-5
[1] 0
> 5*5
[1] 25
> 5/5
[1] 1
> 5^2
[1] 25
> 10%%4
[1] 2
>
> numeric_vector <-c(1,10,49)  #stocker les variables dans le vecteur
> print(numeric_vector) #afficher le contenu du vecteur
[1]  1 10 49
>
```

Exercice1:

Q1: create two vector poker_vector and roulette_vector and assign the winnings/losses for roulette

```
15  #Q1:
16  poker_vector=c(140,-50,20,-120,240)
17  roulette_vector=c(-24,-50,100,-350,10)
```

```
> poker_vector=c(140,-50,20,-120,240)
> roulette_vector=c(-24,-50,100,-350,10)
>
```

Q2: assign the days of the week as names to poker_vector and roulette_vector

```
18  #Q2
19  names(poker_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
20  names(roulette_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
```

```
> names(poker_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
> names(roulette_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
>
```

Q3: create a variable days_vector that contains the days of the week

```
21  #Q3
22  days_vector=c("Monday","Tuesday","Wednesday","Thursday","Friday")
23  names(poker_vector)=days_vector
24  print(days_vector)
```
```
> days_vector=c("Monday","Tuesday","Wednesday","Thursday","Friday")
> names(poker_vector)=days_vector
> print(days_vector)
[1] "Monday"    "Tuesday"   "Wednesday" "Thursday"  "Friday"
>
```

Q4:

```
25  #Q4
26  total_daily=poker_vector+roulette_vector
27  print(total_daily)
28
```
```
> total_daily=poker_vector+roulette_vector
> print(total_daily)
   Monday    Tuesday Wednesday  Thursday    Friday
      116       -100       120      -470       250
>
```

Q5:

a/

```
29  #Q5
30   #/a
31  total_roulette=sum(roulette_vector)
32  print(total_roulette)
```
```
> total_roulette=sum(roulette_vector)
> print(total_roulette)
[1] -314
>
```

b/

```
33
34  #/b
35  total_poker=sum(poker_vector)
36  print(total_poker)
37
```
```
> total_poker=sum(poker_vector)
> print(total_poker)
[1] 230
```

c/

```
38  # /c
39  total_week=total_roulette+total_poker
40  print(total_week)
41
```
```
> total_week=total_roulette+total_poker
> print(total_week)
[1] -84
>
```

Q6:

```
42  #Q6
43  total_poker>total_roulette #the total gains in poker here is higher than the total gains in roulette so we should focus on poker
44
```
```
> total_poker>total_roulette
[1] TRUE
>
```

Q7:

```
44
45   #Q7
46    #names(poker_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
47   poker_wednesday=poker_vector[c(FALSE,FALSE,TRUE,FALSE,FALSE)]
48   print(poker_wednesday)
49
```

```
>   #names(poker_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
> poker_wednesday=poker_vector[c(FALSE,FALSE,TRUE,FALSE,FALSE)]
> print(poker_wednesday)
wednesday
      20
```

Q8:

```
51   #Q8
52   poker_midweek=poker_vector[c(FALSE,TRUE,TRUE,TRUE,FALSE)]
53   print(poker_midweek)
54   #OR
55   poker_midweek=poker_vector[c(2,3,4)]
56   print(poker_midweek)
57
```

```
> poker_midweek=poker_vector[c(FALSE,TRUE,TRUE,TRUE,FALSE)]
> print(poker_midweek)
  Tuesday Wednesday  Thursday
      -50        20      -120
>
> poker_midweek=poker_vector[c(2,3,4)]
> print(poker_midweek)
  Tuesday Wednesday  Thursday
      -50        20      -120
>
```

Q9:

```
58   #Q9
59   roulette_selection=poker_vector[c(2:5)]
60   roulette_selection
```

```
> roulette_selection=poker_vector[c(2:5)]
> roulette_selection
  Tuesday Wednesday  Thursday    Friday
      -50        20      -120       240
```

Q10:

```
62   #Q10
63   names(poker_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
64   poker_gains=poker_vector[c(TRUE,TRUE,TRUE,FALSE,FALSE)]
65   #poker_gains=poker_vector[c(1:3)]
66   average_poker=sum(poker_gains)
67   average_poker
68   |
```

```
> names(poker_vector)=c("Monday","Tuesday","Wednesday","Thursday","Friday")
> poker_gains=poker_vector[c(TRUE,TRUE,TRUE,FALSE,FALSE)]
> #poker_gains=poker_vector[c(1:3)]
> average_poker=sum(poker_gains)
> average_poker
[1] 110
>
```

Q11:

```
68
69   #Q11
70   selection_vector=poker_vector>0
71
72   poker_vector[selection_vector]
73
```

```
> selection_vector=poker_vector>0
> poker_vector[selection_vector]
   Monday Wednesday    Friday
      140        20       240
```

Q12:

```
74  #Q12
75  poker_winning_days=poker_vector[selection_vector]
76  poker_winning_days
77
```

```
> poker_winning_days=poker_vector[selection_vector]
> poker_winning_days
  Monday Wednesday    Friday
     140        20       240
>
```

Exercice2 :

Q1 :

```
73  #exercice2:
74  #Q1:
75  star_wars_matrix=matrix(c(460.998,314.4,290.475,247.900,309.306,165.8), byrow = TRUE, nrow = 3)
76  star_wars_matrix
77
```

```
>
> star_wars_matrix=matrix(c(460.998,314.4,290.475,247.900,309.306,165.8), byrow = TRUE, nrow = 3)
> star_wars_matrix
        [,1]   [,2]
[1,] 460.998 314.4
[2,] 290.475 247.9
[3,] 309.306 165.8
>
```

Q2 :

```
78  #Q2
79  colnames(star_wars_matrix)<-c("US box office","Non Use box office")
80  star_wars_matrix
81
82  rownames(star_wars_matrix)<-c("New_hope","empire_strikes","return_jedi")
83  star_wars_matrix
84
```

```
[3,] 309.306 165.8
> colnames(star_wars_matrix)<-c("US box office","Non Use box office")
> star_wars_matrix
     US box office Non Use box office
[1,]       460.998              314.4
[2,]       290.475              247.9
[3,]       309.306              165.8
> rownames(star_wars_matrix)<-c("New_hope","empire_strikes","return_jedi")
> star_wars_matrix
               US box office Non Use box office
New_hope             460.998              314.4
empire_strikes       290.475              247.9
return_jedi          309.306              165.8
>
```

Q3 :

```
85  #Q3
86  worldwirde_vector=rowSums(star_wars_matrix)
87  worldwirde_vector
88
```

```
> worldwirde_vector=rowSums(star_wars_matrix)
> worldwirde_vector
      New_hope empire_strikes    return_jedi
       775.398        538.375        475.106
>
```

Q4 :

```
89  #Q4
90  all_wars_matrix=cbind(star_wars_matrix,worldwirde_vector)
91  all_wars_matrix
92
```

```
> all_wars_matrix=cbind(star_wars_matrix,worldwirde_vector)
> all_wars_matrix
              US box office Non Use box office worldwirde_vector
New_hope             460.998              314.4           775.398
empire_strikes       290.475              247.9           538.375
return_jedi          309.306              165.8           475.106
>
```

Q5 :

```
92
93  #Q5
94  total_revenue=colSums(star_wars_matrix)
95  total_revenue
96
```

```
> total_revenue=colSums(star_wars_matrix)
> total_revenue
    US box office Non Use box office
         1060.779             728.100
>
```

Q6 :

```
96
97  #Q6
98  mean(all_wars_matrix)
99
```

```
> mean(all_wars_matrix)
[1] 397.5287
>
```

Q7 :

```
100  #Q7
101  visitor=star_wars_matrix/5
102  visitor
103
104
```

```
> visitor=star_wars_matrix/5
> visitor
              US box office Non Use box office
New_hope             92.1996              62.88
empire_strikes       58.0950              49.58
return_jedi          61.8612              33.16
>
```

Exercice3 :

Q1 :

```
> planets_df = data.frame(plantes= c("Mercury","Venus","Earth","Mars","Jupiter","Saturn","Uranus","Neptune"), type=c("Terrestrial planet","Terr
iant","Gas giant"), diameter=c(0.382, 0.949, 1, 0.532, 11.209, 9.449, 4.007, 3.883), rotation=c(58.64, -243.02, 1, 1.03, 0.41, 0.43, -0.72, 0.6
> planets_df
   plantes             type diameter rotation rings
1 Mercury Terrestrial planet    0.382    58.64 FALSE
2   Venus Terrestrial planet    0.949  -243.02 FALSE
3   Earth Terrestrial planet    1.000     1.00 FALSE
4    Mars Terrestrial planet    0.532     1.03 FALSE
5 Jupiter         Gas giant   11.209     0.41  TRUE
6  Saturn         Gas giant    9.449     0.43  TRUE
7  Uranus         Gas giant    4.007    -0.72  TRUE
8 Neptune         Gas giant    3.883     0.67  TRUE
>
```

Q2 :

```
> planets_dfvariable=str(planets_df)
'data.frame':   8 obs. of  5 variables:
 $ plantes : chr  "Mercury" "Venus" "Earth" "Mars" ...
 $ type    : chr  "Terrestrial planet" "Terrestrial planet" "Terrestrial planet" "Terrestrial planet" ...
 $ diameter: num  0.382 0.949 1 0.532 11.209 ...
 $ rotation: num  58.64 -243.02 1 1.03 0.41 ...
 $ rings   : logi  FALSE FALSE FALSE FALSE TRUE TRUE ...
```

Q3 :

```
> closest_plannets_df=data.frame(plantes= c("Mercury","Venus","Earth","Mars","Jupiter","Saturn","Uranus","Neptune"), type=c("Terrestrial plane
t","Terrestrial planet","Terrestrial planet","Terrestrial planet", "Gas giant","Gas giant","Gas giant","Gas giant"), diameter=c(0.382, 0.949,
 1, 0.532, 11.209, 9.449, 4.007, 3.883), rotation=c(58.64, -243.02, 1, 1.03, 0.41, 0.43, -0.72, 0.67), rings=c(FALSE, FALSE, FALSE, FALSE, TRU
E, TRUE, TRUE, TRUE) )
> closest_plannets_df
   plantes            type diameter rotation rings
1 Mercury Terrestrial planet    0.382    58.64 FALSE
2   Venus Terrestrial planet    0.949  -243.02 FALSE
3   Earth Terrestrial planet    1.000     1.00 FALSE
4    Mars Terrestrial planet    0.532     1.03 FALSE
5 Jupiter         Gas giant   11.209     0.41  TRUE
6  Saturn         Gas giant    9.449     0.43  TRUE
7  Uranus         Gas giant    4.007    -0.72  TRUE
8 Neptune         Gas giant    3.883     0.67  TRUE
> |
```

Q4 :

```
> #Q4
> furthest_planets_diameter=c(0.382, 0.949, 1, 0.532, 11.209, 9.449, 4.007, 3.883)
> furthest_planets_diameter
[1]  0.382  0.949  1.000  0.532 11.209  9.449  4.007  3.883
> |
```

Q5 :

```
> #Q5
> small_planets_df = data.frame(plantes= c("Mercury","Venus","Mars"), type=c("Terrestrial planet","Terrestrial planet","Terrestrial planet"), 
iameter=c(0.382, 0.949,0.532), rotation=c(58.64, -243.02, 1.03 ), rings=c(FALSE, FALSE, FALSE) )
> small_planets_df
   plantes            type diameter rotation rings
1 Mercury Terrestrial planet    0.382    58.64 FALSE
2   Venus Terrestrial planet    0.949  -243.02 FALSE
3    Mars Terrestrial planet    0.532     1.03 FALSE
> |
```