

Exercise 1

Name: Vardan

Name: Razmik

```
Name <- c("Alex", "Lilly", "Mark", "Oliver", "Martha", "lucas", "Caroline")
```

```
Age <- c(25,45,26,35,66,78,33)
```

```
Height<- c(180,160,165,156,190,168,149)
```

```
Weight <- c(57,85,59,65,45,56,75)
```

```
Sex <- c("F", "M", "F", "F", "M", "F", "M")
```

```
my_df <- data.frame(Name, Age, Height, Weight, Sex)
```

```
my_df$Sex <- rev(my_df$Sex)
```

```
Name <- c("Alex", "Lilly", "Mark", "Oliver", "Martha", "lucas", "Caroline")
```

```
Working <- c("Yes", "no", "no", "yes", "yes", "no", "yes")
```

```
my_df_1 <- data.frame(Name, Working)
```

```
my_df_2 <- merge(my_df, my_df_1, by = "Name")
```

```
dim(my_df_2)
```

```
my_df_higher <- my_df_2[which(my_df_2$Height > 160), ]
```

```
for (i in 1:ncol(my_df_2)){
```

```
  print(paste(colnames(my_df_2)[i], "=", class(my_df_2[,i]), sep = " "))
```

```
}
```

Name: Mher

```
names <- c("Alex", "Lilly", "Mark", "Oliver", "Martha", "lucas", "Caroline")
```

```
ages <- c(25,45,26,35,66,78,33)
```

```
heights <- c(180,160,165,156,190,168,149)
```

```
weights <- c(57,85,59,65,45,56,75)
```

```
sexes <- c("F", "M", "F", "F", "M", "F", "M")
```

```
my_df <- data.frame(names, ages, heights, weights, sexes)
```

```
names(sexes) <- sexes
```

```
sexes[which(names(sexes) == "F")] <- "M"
```

```
sexes[which(names(sexes) == "M")] <- "F"
```

```
unname(sexes)
```

```
my_df <- data.frame(names, ages, heights, weights, sexes)
```

```
working <- c("yes", "no", "no", "yes", "yes", "no", "yes")
```

```
my_df_1 <- cbind(names, working)
```

```
my_df_2 <- cbind(my_df, working)
dim(my_df_2)
```

```
colnames(my_df_2) <- c("names", "ages", "heights", "weights", "sexes", "working")
rownames(my_df_2) <- NULL
```

Name:Nelly

```
1)
my_df <- data.frame(Name = c("Alex", "Lilly", "Mark", "Oliver", "Martha", "lucas",
"Caroline"),
  Age = c(25, 45, 26, 35, 66, 78, 33),
  Height = c(180, 160, 165, 156, 190, 168, 149),
  Weight = c(57, 85, 59, 65, 45, 56, 75),
  Sex = c("F", "M", "F", "F", "M", "F", "M"))
```

```
2)my_df$sex$ <- c("M", "F", "M", "M", "F", "M", "F")
```

```
3)my_dif_1 <- data.frame(Name = c("Alex", "Lilly", "Mark", "Oliver", "Martha",
"lucas", "Caroline"),
  Working = c("yes", "no", "no", "yes", "yes", "no", "yes"))
my_dif_1
```

```
4)
```

```
my_df_2 <- cbind (my_df, my_dif_1["Working"])
dim(my_df_2)
```

```
5)
```

```
1)sapply(my_df_2,class)
```

```
2)class(my_df_2[, "Name"])
class(my_df_2[, "Age"])
class(my_df_2[, "Height"])
class(my_df_2[, "Weight"])
class(my_df_2[, "Sex"])
class(my_df_2[, "Working"])
```

Gisane

```
my_df<-
data.frame(name=c("Alex","Lilly","Mark","Oliver","Martha","Lucas","Caroline"),
  age=c(25,45,26,35,66,78,33),
  height=c(180,160,165,156,190,168,149),
  weight=c(57,85,59,65,45,56,75),
  sex=c("F","M","F","F","M","F","M"))
```

```
my_df$sex<-c("M","F","M","M","F","M","F")
```

```
my_df_1 <-  
data.frame(name=c("Alex","Lilly","Mark","Oliver","Martha","Lucas","Caroline"),  
           working=c("yes","no","no","yes","yes","no","yes"))
```

```
my_df_2 <- cbind(df, my_df_1)
```

```
class(my_df_2$age)  
class(my_df_2$height)  
class(my_df_2$weight)  
class(my_df_2$sex)  
class(my_df_2$df_1)
```

Name: Susie

```
Name <- c('Alex', 'Lilly', 'Mark', 'Oliver', 'Martha', 'Lucas', 'Caroline' )
```

```
Age <- c(25,45,26,35,66,78,33)
```

```
Heigth <- c(180,160,165,156,190,168,149 )
```

```
Weigth <-c(57,85,59,65,45,56,75)
```

```
Sex <- c('F', 'M', 'F', 'F', 'M', 'F', 'M')
```

```
df <- data.frame(Name = Name, Age = Age, Heigth = Heigth, Weigth = Weigth,  
Sex =Sex)
```

Name: Satenik

```
Name <- c( "Alex", "Lilly", "Mark", "Oliver", "Martha", "lucas", "Caroline")
```

```
Age <- c( 25,45,26,35,66,78,33)
```

```
Heigth <- c( 180,160,165,156,190,168,149)
```

```
Weigth <- c(57,85,59,65,45,56,75)
```

```
Sex <- c( "F", "M", "F", "F", "M", "F", "M")
```

```
my_df <- data.frame(nrow = 1:7, ncol = Name, Age, Heigth, Weigth, Sex)  
my_df
```

```
my_df$Sex<-c("M","F","M","M","F","M","F")  
my_df
```

```
Working <- c( "yes", "no", "no", "yes", "yes", "no", "yes")
```

```
my_df_1 <- data.frame(nrow = 1:7, ncol = Name, Working)
```

```
My_df_1
```

Name: Tamara

```
my_df <- data.frame(Name = c("Alex", "Lily", "Mark", "Oliver", "Martha", "Lucas",  
"Caroline"),
```

```
Age = c(25, 45, 26, 35, 66, 78, 33),
```

```
Height = c(180, 160, 165, 156, 190, 168, 149),
```

```
Weight = c(57, 85, 59, 65, 45, 56, 75),
```

```
Sex = c("F", "M", "F", "F", "M", "F", "M"))
```

```

my_df$Sex <- c("M", "F", "M", "M", "F", "M", "F")
my_df_1 <- data.frame(Name = c("Alex", "Lily", "Mark", "Oliver", "Martha", "Lucas",
"Caroline"),
                      Working = c("yes", "no", "no", "yes", "yes", "no", "yes"))
my_df_2 <- cbind(my_df, my_df_1[-1])
class(my_df_2$Name)
class(my_df_2$Age)
class(my_df_2$Height)
class(my_df_2$Weight)
class(my_df_2$Sex)
class(my_df_2$Working)

```

Name: Ashkhen

```

> Name <- c("Alex", "Lilly", "Mark", "Oliver", "Martha", "lucas", "Caroline")
> Age <- c(25,45,26,35,66,78,33)
> Height <- c(180,160,165,156,190,168,149)
> Weight <- c(57,85,59,65,45,56,75)
> Sex <- c("F", "M", "F", "F", "M", "F", "M")
> my_df <- data.frame(Name, Age, Height, Weight, Sex)
> my_df
  Name Age Height Weight Sex
1  Alex  25   180    57  F
2  Lilly 45   160    85  M
3   Mark 26   165    59  F
4 Oliver 35   156    65  F
5 Martha 66   190    45  M
6  lucas 78   168    56  F
7 Caroline 33  149    75  M
> my_df$Sex[ind == "F"] <- "M"
> my_df$Sex[ind == "M"] <- "F"
> my_df
  Name Age Height Weight Sex
1  Alex  25   180    57  M
2  Lilly 45   160    85  F
3   Mark 26   165    59  M
4 Oliver 35   156    65  M
5 Martha 66   190    45  F
6  lucas 78   168    56  M
7 Caroline 33  149    75  F
> Working <- c("yes", "no", "no", "yes", "yes", "no", "yes")
> my_df_1 <- data.frame(Name, Working)
> my_df_1
  Name Working
1  Alex    yes
2  Lilly   no
3   Mark   no
4 Oliver   yes
5 Martha   yes
6  lucas   no
7 Caroline yes
> my_df_2 <- data.frame(my_df, Working)
> my_df_2
  Name Age Height Weight Sex Working
1  Alex  25   180    57  M    yes
2  Lilly 45   160    85  F     no
3   Mark 26   165    59  M     no
4 Oliver 35   156    65  M    yes
5 Martha 66   190    45  F    yes
6  lucas 78   168    56  M     no
7 Caroline 33  149    75  F    yes

```

```

1 Alex 25 180 57 M yes
2 Lilly 45 160 85 F no
3 Mark 26 165 59 M no
4 Oliver 35 156 65 M yes
5 Martha 66 190 45 F yes
6 lucas 78 168 56 M no
7 Caroline 33 149 75 F yes
> class(my_df_2$Name)
[1] "character"
> class(my_df_2$Age)
[1] "numeric"
> class(my_df_2$Heigth)
[1] "numeric"
> class(my_df_2$Weigth)
[1] "numeric"
> class(my_df_2$Sex)
[1] "character"
> class(my_df_2$Working)
[1] "character"

```

Exercise 2

Name: Gisane

```
my_df_highther<- subset(my_df_2, height > 160)
```

```
mean(my_df_highther$age)
```

Name: Tamara

```
my_df_highter <- subset(my_df_2, Height > 160)
```

```
mean(my_dif_highter$Age)
```

Name: Nelly

```
my_df_highter <- my_df_2[my_df_2$Heigth > 160,]
```

```
mean(my_df_highter$Age)
```

Name: Mher

```
my_df_higher <- my_df_2[my_df_2$heights > 160,]
```

```
mean(my_df_higher$ages)
```

Name: Ashkhen

```
> my_df_highther <- subset(my_df_2, Heigth > 160)
```

```
> my_df_highther
```

```
  Name Age Heigth Weigth Sex Working
```

```
1 Alex 25 180 57 M yes
```

```
3 Mark 26 165 59 M no
```

```
5 Martha 66 190 45 F yes
```

```
6 lucas 78 168 56 M no
```

```
> mean(my_df_highther$Age)
```

```
[1] 48.75
```

Exercise 3

Name: Mher probably Tamara

```
iris[1:5,] Tamara
data("iris")
head(iris, 5)
iris.vers <- iris[iris[, "Species"] == "versicolor",]
sepal_dif <- iris.vers$Sepal.Length - iris.vers$Sepal.Width
mean(sepal_dif)
cbind(iris.vers, sepal_dif)
filter(iris.vers, Sepal.Width > 3.5)
head(filter(iris.vers, Sepal.Width > 3.5) %>% select(Sepal.Width, Species), 5)
```

Name: Raz

```
data('iris')
head(iris)
iris.vers <- iris[which(iris$Species == "versicolor"), ]
c1 <- iris.vers$Sepal.Length
c2 <- iris.vers$Sepal.Width
sepal.dif <- c1 - c2
head(sepal.dif)
mean(sepal.dif)
iris.vers$sepal.dif <- sepal.dif
head(subset(iris.vers, Sepal.Width < 3.5, select = c("Sepal.Width", "Species")))
```

Name: Ashkhen

```
> data("iris")
> head(iris, 5)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
1         5.1         3.5          1.4          0.2  setosa
2         4.9         3.0          1.4          0.2  setosa
3         4.7         3.2          1.3          0.2  setosa
4         4.6         3.1          1.5          0.2  setosa
5         5.0         3.6          1.4          0.2  setosa
> iris.vers <- iris[which(iris$Species == 'versicolor'),]
> iris.vers
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
51          7.0         3.2          4.7          1.4 versicolor
52          6.4         3.2          4.5          1.5 versicolor
53          6.9         3.1          4.9          1.5 versicolor
54          5.5         2.3          4.0          1.3 versicolor
55          6.5         2.8          4.6          1.5 versicolor
56          5.7         2.8          4.5          1.3 versicolor
```

57	6.3	3.3	4.7	1.6 versicolor
58	4.9	2.4	3.3	1.0 versicolor
59	6.6	2.9	4.6	1.3 versicolor
60	5.2	2.7	3.9	1.4 versicolor
61	5.0	2.0	3.5	1.0 versicolor
62	5.9	3.0	4.2	1.5 versicolor
63	6.0	2.2	4.0	1.0 versicolor
64	6.1	2.9	4.7	1.4 versicolor
65	5.6	2.9	3.6	1.3 versicolor
66	6.7	3.1	4.4	1.4 versicolor
67	5.6	3.0	4.5	1.5 versicolor
68	5.8	2.7	4.1	1.0 versicolor
69	6.2	2.2	4.5	1.5 versicolor
70	5.6	2.5	3.9	1.1 versicolor
71	5.9	3.2	4.8	1.8 versicolor
72	6.1	2.8	4.0	1.3 versicolor
73	6.3	2.5	4.9	1.5 versicolor
74	6.1	2.8	4.7	1.2 versicolor
75	6.4	2.9	4.3	1.3 versicolor
76	6.6	3.0	4.4	1.4 versicolor
77	6.8	2.8	4.8	1.4 versicolor
78	6.7	3.0	5.0	1.7 versicolor
79	6.0	2.9	4.5	1.5 versicolor
80	5.7	2.6	3.5	1.0 versicolor
81	5.5	2.4	3.8	1.1 versicolor
82	5.5	2.4	3.7	1.0 versicolor
83	5.8	2.7	3.9	1.2 versicolor
84	6.0	2.7	5.1	1.6 versicolor
85	5.4	3.0	4.5	1.5 versicolor
86	6.0	3.4	4.5	1.6 versicolor
87	6.7	3.1	4.7	1.5 versicolor
88	6.3	2.3	4.4	1.3 versicolor
89	5.6	3.0	4.1	1.3 versicolor
90	5.5	2.5	4.0	1.3 versicolor
91	5.5	2.6	4.4	1.2 versicolor
92	6.1	3.0	4.6	1.4 versicolor
93	5.8	2.6	4.0	1.2 versicolor
94	5.0	2.3	3.3	1.0 versicolor
95	5.6	2.7	4.2	1.3 versicolor
96	5.7	3.0	4.2	1.2 versicolor
97	5.7	2.9	4.2	1.3 versicolor
98	6.2	2.9	4.3	1.3 versicolor
99	5.1	2.5	3.0	1.1 versicolor
100	5.7	2.8	4.1	1.3 versicolor

```
> sepal.length <- iris.vers$Sepal.Length
```

```
> sepal.length
```

```
[1] 7.0 6.4 6.9 5.5 6.5 5.7 6.3 4.9 6.6 5.2 5.0 5.9 6.0 6.1 5.6 6.7 5.6 5.8 6.2 5.6 5.9
```

```
[22] 6.1 6.3 6.1 6.4 6.6 6.8 6.7 6.0 5.7 5.5 5.5 5.8 6.0 5.4 6.0 6.7 6.3 5.6 5.5 5.5 6.1
```

```
[43] 5.8 5.0 5.6 5.7 5.7 6.2 5.1 5.7
```

```
> sepal.width <- iris.vers$Sepal.Width
```

```
> sepal.width
```

```
[1] 3.2 3.2 3.1 2.3 2.8 2.8 3.3 2.4 2.9 2.7 2.0 3.0 2.2 2.9 2.9 3.1 3.0 2.7 2.2 2.5 3.2
```

```
[22] 2.8 2.5 2.8 2.9 3.0 2.8 3.0 2.9 2.6 2.4 2.4 2.7 2.7 3.0 3.4 3.1 2.3 3.0 2.5 2.6 3.0
```

```
[43] 2.6 2.3 2.7 3.0 2.9 2.9 2.5 2.8
```

```

> sepal.dif <- sepal.length - sepal.width
> sepal.dif
[1] 3.8 3.2 3.8 3.2 3.7 2.9 3.0 2.5 3.7 2.5 3.0 2.9 3.8 3.2 2.7 3.6 2.6 3.1 4.0 3.1 2.7
[22] 3.3 3.8 3.3 3.5 3.6 4.0 3.7 3.1 3.1 3.1 3.1 3.3 2.4 2.6 3.6 4.0 2.6 3.0 2.9 3.1
[43] 3.2 2.7 2.9 2.7 2.8 3.3 2.6 2.9
> mean(sepal.dif)
[1] 3.166
> iris.vers <- cbind(iris.vers, sepal.dif)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species sepal.dif
51      7.0      3.2      4.7      1.4 versicolor    3.8
52      6.4      3.2      4.5      1.5 versicolor    3.2
53      6.9      3.1      4.9      1.5 versicolor    3.8
54      5.5      2.3      4.0      1.3 versicolor    3.2
55      6.5      2.8      4.6      1.5 versicolor    3.7
56      5.7      2.8      4.5      1.3 versicolor    2.9
57      6.3      3.3      4.7      1.6 versicolor    3.0
58      4.9      2.4      3.3      1.0 versicolor    2.5
59      6.6      2.9      4.6      1.3 versicolor    3.7
60      5.2      2.7      3.9      1.4 versicolor    2.5
61      5.0      2.0      3.5      1.0 versicolor    3.0
62      5.9      3.0      4.2      1.5 versicolor    2.9
63      6.0      2.2      4.0      1.0 versicolor    3.8
64      6.1      2.9      4.7      1.4 versicolor    3.2
65      5.6      2.9      3.6      1.3 versicolor    2.7
66      6.7      3.1      4.4      1.4 versicolor    3.6
67      5.6      3.0      4.5      1.5 versicolor    2.6
68      5.8      2.7      4.1      1.0 versicolor    3.1
69      6.2      2.2      4.5      1.5 versicolor    4.0
70      5.6      2.5      3.9      1.1 versicolor    3.1
71      5.9      3.2      4.8      1.8 versicolor    2.7
72      6.1      2.8      4.0      1.3 versicolor    3.3
73      6.3      2.5      4.9      1.5 versicolor    3.8
74      6.1      2.8      4.7      1.2 versicolor    3.3
75      6.4      2.9      4.3      1.3 versicolor    3.5
76      6.6      3.0      4.4      1.4 versicolor    3.6
77      6.8      2.8      4.8      1.4 versicolor    4.0
78      6.7      3.0      5.0      1.7 versicolor    3.7
79      6.0      2.9      4.5      1.5 versicolor    3.1
80      5.7      2.6      3.5      1.0 versicolor    3.1
81      5.5      2.4      3.8      1.1 versicolor    3.1
82      5.5      2.4      3.7      1.0 versicolor    3.1
83      5.8      2.7      3.9      1.2 versicolor    3.1
84      6.0      2.7      5.1      1.6 versicolor    3.3
85      5.4      3.0      4.5      1.5 versicolor    2.4
86      6.0      3.4      4.5      1.6 versicolor    2.6
87      6.7      3.1      4.7      1.5 versicolor    3.6
88      6.3      2.3      4.4      1.3 versicolor    4.0
89      5.6      3.0      4.1      1.3 versicolor    2.6
90      5.5      2.5      4.0      1.3 versicolor    3.0
91      5.5      2.6      4.4      1.2 versicolor    2.9
92      6.1      3.0      4.6      1.4 versicolor    3.1
93      5.8      2.6      4.0      1.2 versicolor    3.2
94      5.0      2.3      3.3      1.0 versicolor    2.7
95      5.6      2.7      4.2      1.3 versicolor    2.9

```


96	5.7	3.0	4.2	1.2	versicolor	2.7
97	5.7	2.9	4.2	1.3	versicolor	2.8
98	6.2	2.9	4.3	1.3	versicolor	3.3
99	5.1	2.5	3.0	1.1	versicolor	2.6
100	5.7	2.8	4.1	1.3	versicolor	2.9

```
> head(iris.vers[iris.vers$Sepal.Width < 3.5, c("Sepal.Width", "Species" )], 5)
```

```
  Sepal.Width  Species
51      3.2 versicolor
52      3.2 versicolor
53      3.1 versicolor
54      2.3 versicolor
55      2.8 versicolor
```

Name: Mher !

```
data("iris")
head(iris)
splitted <- split(iris, iris$Species)
splitted
iris.vers <- splitted["versicolor"]
iris.vers
#or
iris.vers <- filter(iris, iris$Species == "versicolor")
iris.vers

sepal.diff <- iris.vers$Sepal.Length - iris.vers$Sepal.Width
sepal.diff
cbind(iris.vers, sepal.diff)

filter(iris.vers, iris.vers$Sepal.Width > 3.5)

iris.vers[1:5, c(2,5)]
```

Exercise 4

Name: Gisane

```
my_mat <- matrix(1:50, nrow = 10, ncol = 5, dimnames = list(1:10, letters[1:5]))
```

```
my_mat[, c("a", "d")]
sum(my_mat[, c("a", "d")])
```

Name: Tamara

```
my_mat <- matrix(1:50, 10, 5, dimnames = list(1:10, letters[1:5]))
sum(my_mat[, c("a", "d")])
```

Name: Raz

```
my_mat <- matrix(data = 1:50, nrow = 10, ncol = 5)
```

```
colnames(my_mat) <- letters[seq(1:5)]
sum(colSums(my_mat[, c("a","d")]))
```

Name: Ashkhen

```
> my_mat <- matrix(1:50, 10, 5)
> my_mat
      [,1] [,2] [,3] [,4] [,5]
[1,]  1  11  21  31  41
[2,]  2  12  22  32  42
[3,]  3  13  23  33  43
[4,]  4  14  24  34  44
[5,]  5  15  25  35  45
[6,]  6  16  26  36  46
[7,]  7  17  27  37  47
[8,]  8  18  28  38  48
[9,]  9  19  29  39  49
[10,] 10 20 30 40 50
> colnames(my_mat) <- c("a", "b", "c", "d", "e")
> my_mat
      a b c d e
[1,]  1 11 21 31 41
[2,]  2 12 22 32 42
[3,]  3 13 23 33 43
[4,]  4 14 24 34 44
[5,]  5 15 25 35 45
[6,]  6 16 26 36 46
[7,]  7 17 27 37 47
[8,]  8 18 28 38 48
[9,]  9 19 29 39 49
[10,] 10 20 30 40 50
> sum(my_mat[,c("a", "d")])
[1] 410
```

Name: Mher

```
my_mat <- matrix(1:50, nrow = 10, ncol = 5)
my_mat
colnames(my_mat) <- list("a", "b", "c", "d", "e")
sum(my_mat[, 1], my_mat[, 4])
```