1)Summarizing:-

```
#create a data frame
data1<-data.frame(player=c('A','B','c','D','E'),
            runs=c(100,200,105,50,90),
            wickets=c(15,20,8,5,8)
            )
data1
#summarize method
summarize(data1,sum(runs),mean(runs),mode(wickets))
//summarize(data1)
```

---

2)Sorting:-

```
#creating data frame
dataBook=data.frame(Customers=c("Ruhi","James","Heera","Shubham","Joe","Priya"),
                    Products=c("ProdA","ProdB","ProdC","ProdD","ProdE","prodF"),
                    Salary=c(500,600,450,700,300,400))
dataBook
#sorting the data frame in ascending order
arrange(dataBook,Salary)
#sorting the data frame in descending order
dataBook%>%arrange(desc(Salary))
```

---

3)Subsetting:-

```
#Subsetting in R using []operator:
#create vector
x<-1:15
cat("Original vector:",x,"\n")
#subsetting vector:
cat("First 5 values of vector:",x[1:5],"\n")
cat("Without values present at index 1,2and 3",x[-c(1,2,3),"\n"])
#Subsetting in R using [[]]operator:
#create list:
ls<-list(a=1,b=2,c=10,d=20)
cat("Original List:\n")
print(ls)
#select first element of list:
cat("Element of list:",ls[[3]],"\n")
#Subsetting using c() function:
ls2<-list(a=list(x=1,y="students"),b=1:10)
ls2
cat("Using c() function:\n")
//print(ls2[[c(1,2)]])
//print(ls2[[1]][[2]])
#Subsetting Using $ operator:
ls3<-list(a="Roshani",b=1,c="Hello")
ls3
cat("Using $ operator:\n")
```

```
print(ls3$a)
```

---

4)Merging: -

```
#Merge DataFrames by Row Names:-
data_frame1<-data.frame(No=c(1:5),
                        Name=letters[1:5],
                        Salary=c(200,200,300,NA,300)
                        )
data_frame1

data_frame2<-data.frame(No=c(6:8),
                        Name=letters[8:10],
                        Salary=c(400,350,NA)
                        )
data_frame2

data_frame_merge<-merge(data_frame1,data_frame2,by='row.names',all=TRUE)
print("Merged DataFrame")
print(data_frame_merge)
```

---

5)Joining:-

```
#Using Inner join:-
data1<-data.frame(ID=c(1:5))
data2<-data.frame(ID=c(4:8))
inner_join(data1,data2,by="ID")

#Using Left join:-
data1<-data.frame(ID=c(1:5),
                  Name=c("Rutuja","Lokesh","Ram","Purvi","Nita"))
data2<-data.frame(ID=c(4:8),
                  Marks=c(70,85,80,90,75))
left_join(data1,data2,by="ID")
```

OUTPUT: -

```
#1)Summarizing:-
> #create a data frame
> data1<-data.frame(player=c('A','B','c','D','E'),
+                   runs=c(100,200,105,50,90),
+                   wickets=c(15,20,8,5,8)
+                   )
> data1
  player runs wickets
1      A  100      15
2      B  200      20
3      c  105       8
```

```
4     D  50      5
5     E  90      8
> #summarize method
> summarize(data1,sum(runs),mean(runs),mode(wickets))
  sum(runs) mean(runs) mode(wickets)
1       545       109       numeric
> #-------------------------------------------------------------------------
> #2)Sorting:-
> #creating data frame
> dataBook=data.frame(Customers=c("Ruhi","James","Heera","Shubham","Joe","Priya"),
+                     Products=c("ProdA","ProdB","ProdC","ProdD","ProdE","prodF"),
+                     Salary=c(500,600,450,700,300,400))
> dataBook
  Customers Products Salary
1     Ruhi    ProdA    500
2    James    ProdB    600
3    Heera    ProdC    450
4  Shubham    ProdD    700
5      Joe    ProdE    300
6    Priya    prodF    400
> #sorting the data frame in ascending order
> arrange(dataBook,Salary)
  Customers Products Salary
1      Joe    ProdE    300
2    Priya    prodF    400
3    Heera    ProdC    450
4     Ruhi    ProdA    500
5    James    ProdB    600
6  Shubham    ProdD    700
> #sorting the data frame in descending order
> dataBook%>%arrange(desc(Salary))
  Customers Products Salary
1  Shubham    ProdD    700
2    James    ProdB    600
3     Ruhi    ProdA    500
4    Heera    ProdC    450
5    Priya    prodF    400
6      Joe    ProdE    300
> #-------------------------------------------------------------------------
> #3)Subsetting:-
> #Subsetting in R using []operator:
> #create vector
> x<-1:15
> cat("Original vector:",x,"\n")
Original vector: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
> #subsetting vector:
> cat("First 5 values of vector:",x[1:5],"\n")
```

```
First 5 values of vector: 1 2 3 4 5
> cat("Without values present at index 1,2and 3:",x[-c(1,2,3)])
Without values present at index 1,2and 3: 4 5 6 7 8 9 10 11 12 13 14 15> #Subsetting in R
using [[]]operator:
> #create list:
> ls<-list(a=1,b=2,c=10,d=20)
> cat("Original List:\n")
Original List:
> print(ls)
$a
[1] 1

$b
[1] 2

$c
[1] 10

$d
[1] 20

> #select first element of list:
> cat("Element of list:",ls[[3]],"\n")
Element of list: 10
> #Subsetting using c() function:
> ls2<-list(a=list(x=1,y="students"),b=1:10)
> ls2
$a
$a$x
[1] 1

$a$y
[1] "students"


$b
 [1]  1  2  3  4  5  6  7  8  9 10

> cat("Using c() function:\n")
Using c() function:
> print(ls2[[c(1,2)]])
[1] "students"
> print(ls2[[1]][[2]])
[1] "students"
> #Subsetting Using $ operator:
> ls3<-list(a="Roshani",b=1,c="Hello")
> ls3
```

```
$a
[1] "Roshani"

$b
[1] 1

$c
[1] "Hello"

> cat("Using $ operator:\n")
Using $ operator:
> print(ls3$a)
[1] "Roshani"
> #-------------------------------------------------------------------------------
> #4)Merging:-
> #Merge DataFrames by Row Names:-
> data_frame1<-data.frame(No=c(1:5),
+                         Name=letters[1:5],
+                         Salary=c(200,200,300,NA,300)
+                         )
> data_frame1
  No Name Salary
1  1    a    200
2  2    b    200
3  3    c    300
4  4    d     NA
5  5    e    300
>
> data_frame2<-data.frame(No=c(6:8),
+                         Name=letters[8:10],
+                         Salary=c(400,350,NA)
+                         )
> data_frame2
  No Name Salary
1  6    h    400
2  7    i    350
3  8    j     NA
>
> data_frame_merge<-merge(data_frame1,data_frame2,by='row.names',all=TRUE)
> print("Merged DataFrame")
[1] "Merged DataFrame"
> print(data_frame_merge)
  Row.names No.x Name.x Salary.x No.y Name.y Salary.y
1         1    1      a      200    6      h      400
2         2    2      b      200    7      i      350
3         3    3      c      300    8      j       NA
4         4    4      d       NA   NA   <NA>       NA
```

```
5       5   5     e     300   NA  <NA>      NA
> #-------------------------------------------------------------------------------
> #5)Joining:-
> #Using Inner join:-
> data1<-data.frame(ID=c(1:5))
> data2<-data.frame(ID=c(4:8))
> inner_join(data1,data2,by="ID")
  ID
1  4
2  5
>
> #Using Left join:-
> data1<-data.frame(ID=c(1:5),
+                   Name=c("Rutuja","Lokesh","Ram","Purvi","Nita"))
> data2<-data.frame(ID=c(4:8),
+                   Marks=c(70,85,80,90,75))
> left_join(data1,data2,by="ID")
  ID   Name Marks
1  1 Rutuja    NA
2  2 Lokesh    NA
3  3    Ram    NA
4  4  Purvi    70
5  5   Nita    85
```