# Lab Assignment-3

Name: Khushi Prasad
SubGroup: 3CO20
Roll No.: 102183044
Subject: Data Science Fundamentals

Q1. Create an array A with elements (12, 13, 14, 15, 16) and display them.
CODE:

```
A<-array(c(12,13,14,15,16))
print(A)
```

OUTPUT:

```
[1] 12 13 14 15 16
```

Q2. Find the sum of all the elements of A.
CODE:

```
sum(A)
```

OUTPUT:

```
[1] 70
```

Q3. Find the product of all the element of A.
CODE:

```
prod(A)
```

OUTPUT:

```
[1] 524160
```

Q4. Find the maximum and minimum element of A.
CODE:

```
max(A)
min(A)
```

OUTPUT:

```
> max(A)
[1] 16
> min(A)
[1] 12
```

Q5. Find the range of array A.
CODE:

```
range(A)
```

OUTPUT:

```
> range(A)
[1] 12 16
```

Q6. Find the mean, variance, standard deviation and median of value of A.
CODE:

```
mean(A)
median(A)
var(A)
sd(A)
```

OUTPUT:

```
> mean(A)
[1] 14
> median(A)
[1] 14
> var(A)
[1] 2.5
> sd(A)
[1] 1.581139
```

Q7. Sort the element of A both in increasing and decreasing order and store them in B and C.
CODE:

```
B<-sort(A)
print(B)
C<-sort(A, decreasing = TRUE)
print(C)
```

OUTPUT:

```
> B<-sort(A)
> print(B)
[1] 12 13 14 15 16
> C<-sort(A, decreasing = TRUE)
> print(C)
[1] 16 15 14 13 12
```

Q8. Create a matrix of 3x4 to have the set of natural numbers.
CODE:

```
matrix(c(1:12),3,4)
```

OUTPUT:

```
> matrix(c(1:12),3,4)
     [,1] [,2] [,3] [,4]
[1,]    1    4    7   10
[2,]    2    5    8   11
[3,]    3    6    9   12
```

Q9. Create MxN matrix by combining A, B and C row-wise (RW) and column-wise(CW).
CODE:

```
rw<-matrix(c(A,B,C),3,5,byrow = TRUE)
cw<-matrix(c(A,B,C),5,3,byrow = FALSE)
print(rw)
print(cw)

# or
RW<-rbind(A,B,C)
CW<-cbind(A,B,C)
print(RW)
print(CW)
```

OUTPUT:

```
> print(RW)
  [,1] [,2] [,3] [,4] [,5]
A   12   13   14   15   16
B   12   13   14   15   16
C   16   15   14   13   12
> print(CW)
      A  B  C
[1,] 12 12 16
[2,] 13 13 15
[3,] 14 14 14
[4,] 15 15 13
[5,] 16 16 12
```

Q10. Find the 2 and 3 row element of RW.
CODE:

```
46  RW[2:3,]
```

OUTPUT:

```
> RW[2:3,]
  [,1] [,2] [,3] [,4] [,5]
B   12   13   14   15   16
C   16   15   14   13   12
```

Q11. Find the 1 and 3 column of CW.
CODE:

```
49  CW[,c(1,3)]
```

OUTPUT:

```
      A  C
[1,] 12 16
[2,] 13 15
[3,] 14 14
[4,] 15 13
[5,] 16 12
```

Q12. Using both RW and CW find sub-matrices having elements [2, 3] and [2, 3].
CODE:

```
52  x<-matrix(c(RW[2,3],CW[2,3]))
53  print(x)
```

OUTPUT:

```
     [,1]
[1,]   14
[2,]   15
```