

**SAVEETHA SCHOOL OF ENGINEERING**

**SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCE**

**ITA 0443 - STATISTICS WITH R PROGRAMMING FOR REAL TIME PROBLEM**

**DAY 3 – LAB ASSESSMENT**

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**1. (i) Write a function in R programming to print generate Fibonacci sequence using Recursion in R**

**CODE:-**

```
fib <- function(n) {  
  if (n <= 0) {  
    return(0)  
  } else if (n == 1) {  
    return(1)  
  } else {  
    return (fib(n-1) + fib(n-2))  
  }  
}
```

```
# To print the first 10 terms of the Fibonacci sequence  
for (i in 1:10) {  
  print(fib(i))  
}
```

**output:**

```
[1] 0  
[1] 1  
[1] 1  
[1] 2  
[1] 3  
[1] 5  
[1] 8  
[1] 13  
[1] 21  
[1] 34
```

**(ii) Find sum of natural numbers up-to 10, without formula using loop statement.**

**CODE:-**

```
sum <- 0
for (i in 1:10) {
  sum <- sum + i
}
print(sum)
```

**output:**

```
[1] 55
```

**(iii) create a vector 1:10 and Find a square of each number and store that in a separate list.**

**CODE:**

```
vec <- 1:10
squared_list <- c()
for (i in vec) {
  squared_list[i] <- i^2
}
print(squared_list)
```

**output:**

```
[1] 1 4 9 16 25 36 49 64 81 100
```

**2. (motor trend car road test) comprises fuel consumption, performance and 10 aspects**

**of automobile**

**design for 32 automobiles. It comes pre-installed with package in R.**

**CODE:-**

```
install.packages("dplyr")

library(dplyr)

str(mtcars)
```

**OUTPUT:-**

```
'data.frame': 32 obs. of 11 variables:
```

```
$ mpg : num 21 21 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 ...
```

```
$ cyl : num 6 6 4 6 8 6 8 4 4 6 ...
```

```
$ disp: num 160 160 108 258 360 ...
```

```
$ hp : num 110 110 93 110 175 105 245 62 95 123 ...
$ drat: num 3.9 3.9 3.85 3.08 3.15 2.76 3.21 3.69 3.92 3.92 ...
$ wt : num 2.62 2.88 2.32 3.21 3.44 ...
$ qsec: num 16.5 17 18.6 19.4 17 ...
$ vs : num 0 0 1 1 0 1 0 1 1 1 ...
$ am : num 1 1 1 0 0 0 0 0 0 0 ...
$ gear: num 4 4 4 3 3 3 3 4 4 4 ...
$ carb: num 4 4 1 1 2 1 4 2 2 4 ...
```

**(i)Find the dimension of the dataset**

**CODE:-**

```
install.packages("dplyr")
library(dplyr)
str(mtcars)
dim(mtcars)
```

**OUTPUT:-**

```
[1] 32 11
```

**(ii)Give the statistical summary of the features.**

**CODE:-**

```
install.packages("dplyr")
library(dplyr)
str(mtcars)
print("STATISTICAL SUMMARY")
print(summary(mt
```

**OUTPUT:-**

mpg	cyl	disp	hp	drat
Min. :10.40	Min. :4.000	Min. :71.1	Min. :52.0	Min. :2.760
1st Qu.:15.43	1st Qu.:4.000	1st Qu.:120.8	1st Qu.:96.5	1st Qu.:3.080
Median :19.20	Median :6.000	Median :196.3	Median :123.0	Median :3.695
Mean :20.09	Mean :6.188	Mean :230.7	Mean :146.7	Mean :3.597
3rd Qu.:22.80	3rd Qu.:8.000	3rd Qu.:326.0	3rd Qu.:180.0	3rd Qu.:3.920
Max. :33.90	Max. :8.000	Max. :472.0	Max. :335.0	Max. :4.930

  

wt	qsec	vs	am	gear
Min. :1.513	Min. :14.50	Min. :0.0000	Min. :0.0000	Min. :3.000
1st Qu.:2.581	1st Qu.:16.89	1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:3.000
Median :3.325	Median :17.71	Median :0.0000	Median :0.0000	Median :4.000
Mean :3.217	Mean :17.85	Mean :0.4375	Mean :0.4062	Mean :3.688
3rd Qu.:3.610	3rd Qu.:18.90	3rd Qu.:1.0000	3rd Qu.:1.0000	3rd Qu.:4.000
Max. :5.424	Max. :22.90	Max. :1.0000	Max. :1.0000	Max. :5.000

  

carb
Min. :1.000
1st Qu.:2.000
Median :2.000
Mean :2.812
3rd Qu.:4.000
Max. :8.000

**(iii)Print the categorical features in Dataset**

**CODE:-**

```
head(mtcars)
```

## OUTPUT:-

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360	175	3.15	3.440	17.02	0	0	3	2
Valiant	18.1	6	225	105	2.76	3.460	20.22	1	0	3	1