SESSION 3: FOUNDATIONAL R PROGRAMMING

Assignment 4

Problem Statement

A. Implement user defined functions within apply function using the mtcars data set and produce column wise summary statistics using apply function and mtcars dataset.
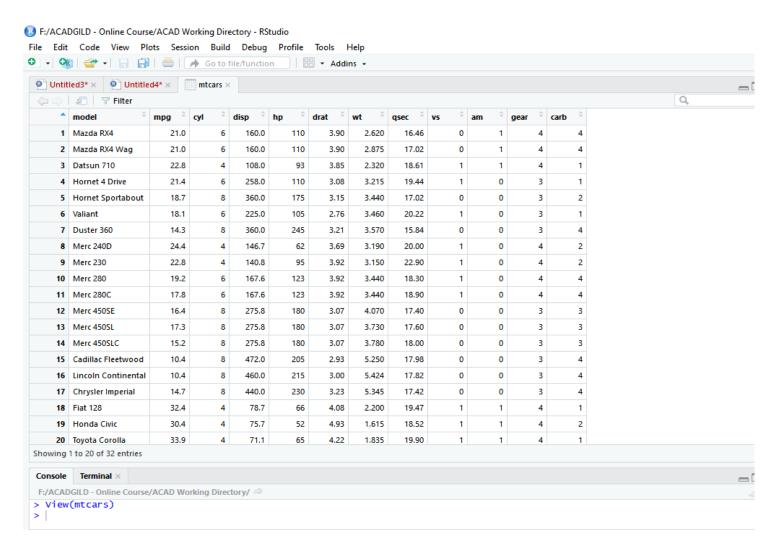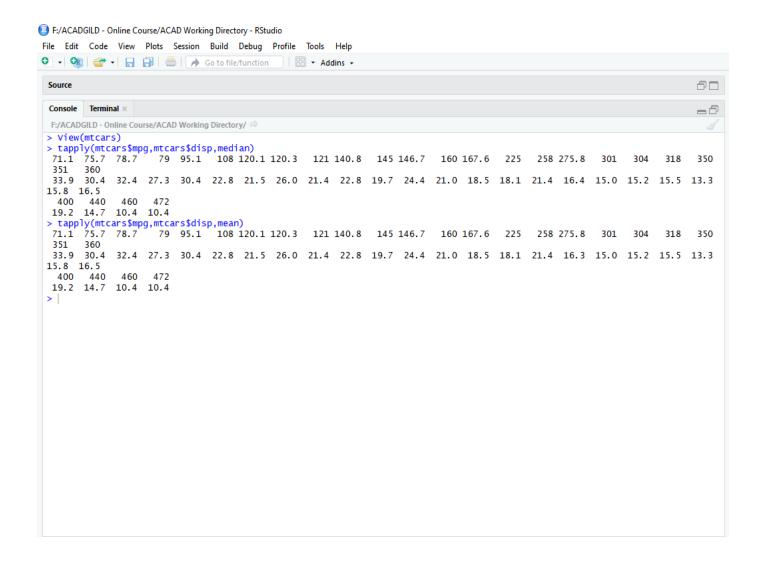
Solution:

View(mtcars)

tapply(mtcars$mpg,mtcars$disp,median)   # finding the median of the data

tapply(mtcars$mpg,mtcars$disp,mean)   # finding the mean of the data

The R- Script Output is been shown below :

Untitled3* ×   Untitled4* ×   mtcars ×

Filter

	model	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
1	Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
2	Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0	1	4	4
3	Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1	1	4	1
4	Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
5	Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0	0	3	2
6	Valiant	18.1	6	225.0	105	2.76	3.460	20.22	1	0	3	1
7	Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0	0	3	4
8	Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00	1	0	4	2
9	Merc 230	22.8	4	140.8	95	3.92	3.150	22.90	1	0	4	2
10	Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1	0	4	4
11	Merc 280C	17.8	6	167.6	123	3.92	3.440	18.90	1	0	4	4
12	Merc 450SE	16.4	8	275.8	180	3.07	4.070	17.40	0	0	3	3
13	Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60	0	0	3	3
14	Merc 450SLC	15.2	8	275.8	180	3.07	3.780	18.00	0	0	3	3
15	Cadillac Fleetwood	10.4	8	472.0	205	2.93	5.250	17.98	0	0	3	4
16	Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82	0	0	3	4
17	Chrysler Imperial	14.7	8	440.0	230	3.23	5.345	17.42	0	0	3	4
18	Fiat 128	32.4	4	78.7	66	4.08	2.200	19.47	1	1	4	1
19	Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52	1	1	4	2
20	Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.90	1	1	4	1

Showing 1 to 20 of 32 entries

Console   Terminal ×

F:/ACADGILD - Online Course/ACAD Working Directory/ ⌨
```
> View(mtcars)
> |
```

Source

Console   Terminal ×

F:/ACADGILD - Online Course/ACAD Working Directory/

```
> View(mtcars)
> tapply(mtcars$mpg,mtcars$disp,median)
 71.1   75.7   78.7     79   95.1     108 120.1 120.3     121 140.8     145 146.7     160 167.6     225     258 275.8     301     304     318     350
 351    360
 33.9   30.4   32.4   27.3   30.4   22.8   21.5   26.0   21.4   22.8   19.7   24.4   21.0   18.5   18.1   21.4   16.4   15.0   15.2   15.5   13.3
 15.8   16.5
  400    440    460    472
 19.2   14.7   10.4   10.4
> tapply(mtcars$mpg,mtcars$disp,mean)
 71.1   75.7   78.7     79   95.1     108 120.1 120.3     121 140.8     145 146.7     160 167.6     225     258 275.8     301     304     318     350
 351    360
 33.9   30.4   32.4   27.3   30.4   22.8   21.5   26.0   21.4   22.8   19.7   24.4   21.0   18.5   18.1   21.4   16.3   15.0   15.2   15.5   13.3
 15.8   16.5
  400    440    460    472
 19.2   14.7   10.4   10.4
>
```

B. write a program to extract the names of the list.

Solution:

n=list(mtcars$mpg,mtcars$cyl,mtcars$disp,mtcars$hp)

n

colnames(mtcars)

The R- Script Output is been shown below :

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function   ▾ Addins ▾

ACAD Workir

Source

| Console | Terminal × |

F:/ACADGILD - Online Course/ACAD Working Directory/

```
> tapply(mtcars$mpg,mtcars$disp,median)
 71.1  75.7  78.7    79  95.1   108 120.1 120.3   121 140.8   145 146.7   160 167.6   225   258 275.8   301   304   318   350   351   360
 33.9  30.4  32.4  27.3  30.4  22.8  21.5  26.0  21.4  22.8  19.7  24.4  21.0  18.5  18.1  21.4  16.4  15.0  15.2  15.5  13.3  15.8  16.5
  400   440   460   472
 19.2  14.7  10.4  10.4
> tapply(mtcars$mpg,mtcars$disp,mean)
 71.1  75.7  78.7    79  95.1   108 120.1 120.3   121 140.8   145 146.7   160 167.6   225   258 275.8   301   304   318   350   351   360
 33.9  30.4  32.4  27.3  30.4  22.8  21.5  26.0  21.4  22.8  19.7  24.4  21.0  18.5  18.1  21.4  16.3  15.0  15.2  15.5  13.3  15.8  16.5
  400   440   460   472
 19.2  14.7  10.4  10.4
> n=list(mtcars$mpg,mtcars$cyl,mtcars$disp,mtcars$hp)
> n
[[1]]
 [1] 21.0 21.0 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 17.8 16.4 17.3 15.2 10.4 10.4 14.7 32.4 30.4 33.9 21.5 15.5 15.2 13.3 19.2 27.3
[27] 26.0 30.4 15.8 19.7 15.0 21.4

[[2]]
 [1] 6 6 4 6 8 6 8 4 4 6 6 8 8 8 8 8 8 4 4 4 4 8 8 8 8 4 4 4 8 6 8 4

[[3]]
 [1] 160.0 160.0 108.0 258.0 360.0 225.0 360.0 146.7 140.8 167.6 167.6 275.8 275.8 275.8 472.0 460.0 440.0  78.7  75.7  71.1 120.1 318.0
[23] 304.0 350.0 400.0  79.0 120.3  95.1 351.0 145.0 301.0 121.0

[[4]]
 [1] 110 110  93 110 175 105 245  62  95 123 123 180 180 180 205 215 230  66  52  65  97 150 150 245 175  66  91 113 264 175 335 109

> colnames(mtcars)
 [1] "model" "mpg"   "cyl"   "disp"  "hp"    "drat"  "wt"    "qsec"  "vs"    "am"    "gear"  "carb"
> |
```