



ACADGILD

SESSION 3: FOUNDATIONAL R PROGRAMMING

Assignment 4

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1. Introduction

This assignment will help you understand the concepts learnt in the session.

2. Objective

This assignment will test your skills on Operations on Data Structures in R.

3. Prerequisites

Not applicable.

4. Associated Data Files

Not applicable.

5. 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.
- B. write a program to extract the names of the list.

A-

```
mtcars
head(mtcars)
summary(mtcars)

tapply(mtcars$mpg,mtcars$cyl,mean)
tapply(mtcars$mpg,mtcars$cyl,mean)
mtmeans <-lapply(mtcars,mean)

mtsd <- lapply(mtcars,sd)
mtvar <- lapply(mtcars,var)
```

RStudio interface showing a script, console output, and environment pane.

Script Editor:

```
1 mtcars
2 head(mtcars)
3 summary(mtcars)
4 tapply(mtcars$mpg,mtcars$cyl,mean)
5 tapply(mtcars$mpg,mtcars$cyl,mean)
6 mtmeans <- lapply(mtcars,mean)
7 mtstd <- lapply(mtcars,sd)
8 mtvar <- lapply(mtcars,var)
9
10
```

Console:

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

Environment Pane:

| Object | Value |
|--------------------|------------------------|
| Global Environment | |
| slr | 12 obs. of 4 variables |
| slr1 | 12 obs. of 5 variables |
| slr2 | 12 obs. of 6 variables |

Files Pane:

Files | Plots | Packages | Help | Viewer

Zoom | Export

9:48 PM 1/5/2019

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins Project: (None)

Untitled3* x assignment3.4.r x Untitled9* x Untitled6 >>

Source on Save Source

```

1 mtcars
2 head(mtcars)
3 summary(mtcars)
4 tapply(mtcars$mpg,mtcars$cyl,mean)
9:1 (Top Level)

```

Console Terminal

```

> head(mtcars)
      mpg  cyl  disp  hp drat   wt  qsec
Mazda RX4     21.0   6  160 110 3.90 2.620 16.46
Mazda RX4 Wag 21.0   6  160 110 3.90 2.875 17.02
Datsun 710     22.8   4  108  93 3.85 2.320 18.61
Hornet 4 Drive 21.4   6  258 110 3.08 3.215 19.44
Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02
Valiant        18.1   6  225 105 2.76 3.460 20.22
      vs am gear carb
Mazda RX4          0  1   4   4
Mazda RX4 Wag      0  1   4   4
Datsun 710          1  1   4   1
Hornet 4 Drive      1  0   3   1
Hornet Sportabout  0  0   3   2
Valiant             1  0   3   1
> tapply(mtcars$mpg,mtcars$cyl,mean)
      4      6      8
26.66364 19.74286 15.10000
> tapply(mtcars$mpg,mtcars$cyl,mean)

```

Environment History Connections

Global Environment

Data

| Variable | Obs. | Variables |
|----------|---------|----------------|
| slr | 12 obs. | of 4 variables |
| slr1 | 12 obs. | of 5 variables |
| slr2 | 12 obs. | of 6 variables |

Files Plots Packages Help Viewer

Zoom Export

9:49 PM 1/5/2019

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins Project: (None)

Untitled3* x assignment3.4.r x Untitled9* x Untitled6 >>

Source on Save Source

```

1 mtcars
2 head(mtcars)
3 summary(mtcars)
4 tapply(mtcars$mpg,mtcars$cyl,mean)
9:1 (Top Level)

```

Console Terminal

```

Valiant      1  0  3  1
> tapply(mtcars$mpg,mtcars$cyl,mean)
      4      6      8
26.66364 19.74286 15.10000
> tapply(mtcars$mpg,mtcars$cyl,mean)
      4      6      8
26.66364 19.74286 15.10000
> mtsd <- tapply(mtcars,sd)
> mtvar <- tapply(mtcars,var)
> mtsd
$mpg
[1] 6.026948

$cyl
[1] 1.785922

$disp
[1] 123.9387

```

Environment History Connections

Global Environment

Data

| Variable | Obs. | Variables |
|----------|---------|----------------|
| slr | 12 obs. | of 4 variables |
| slr1 | 12 obs. | of 5 variables |
| slr2 | 12 obs. | of 6 variables |

Files Plots Packages Help Viewer

Zoom Export

9:51 PM 1/5/2019

RStudio interface showing a script editor, console, and environment pane.

Script Editor:

```
1 mtcars
2 head(mtcars)
3 summary(mtcars)
4 apply(mtcars$mpg, mtcars$ cyl, mean)
9:1 (Top Level)
```

Console:

```
> mtsd
$`mpg`
[1] 6.026948

$`cyl`
[1] 1.785922

$`disp`
[1] 123.9387

$`hp`
[1] 68.56287

$`drat`
[1] 0.5346787

$`wt`
[1] 0.9784574
```

Environment Pane:

| Object | Value |
|--------------------|------------------------|
| Global Environment | |
| slr | 12 obs. of 4 variables |
| slr1 | 12 obs. of 5 variables |
| slr2 | 12 obs. of 6 variables |

Files Pane:

Files | Plots | Packages | Help | Viewer

Zoom | Export

Data Analytics

6. Expected Format

1. R file should be submitted where applicable.
2. R file should be in PDF or in .r format
3. Proper screenshots of the outputs should be submitted as well
4. The r codes, if submitted in any other format, will be subjected to deduction in marks

Note: Your solution will not be entertained if it is any other format, e.g., .zip, .doc, .rtf etc.

7. Approximate Time to Complete Task

30 mins.

