

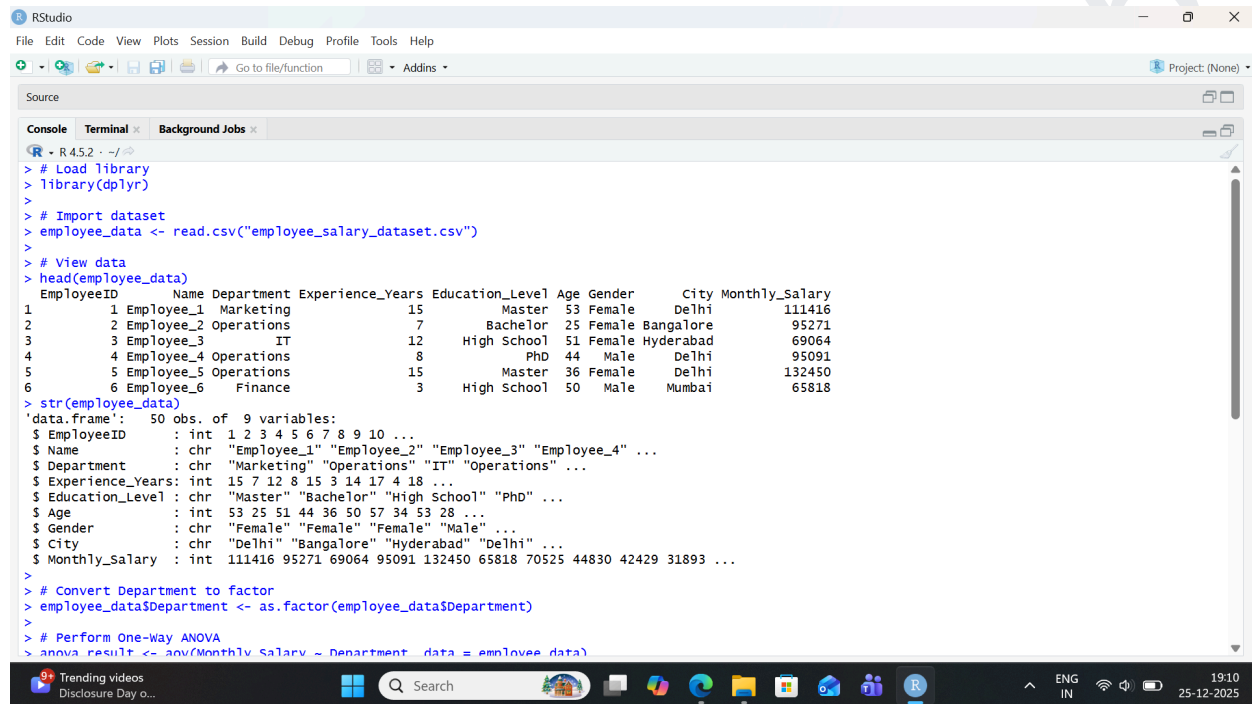
SHETH L.U.J. AND SIR M.V. COLLEGE OF ARTS SCIENCE AND COMMERCE

SUBJECT : R Programming

Practical No 7 Module II

Aim : 7 Performing one-way ANOVA using aov() (R).

Output :



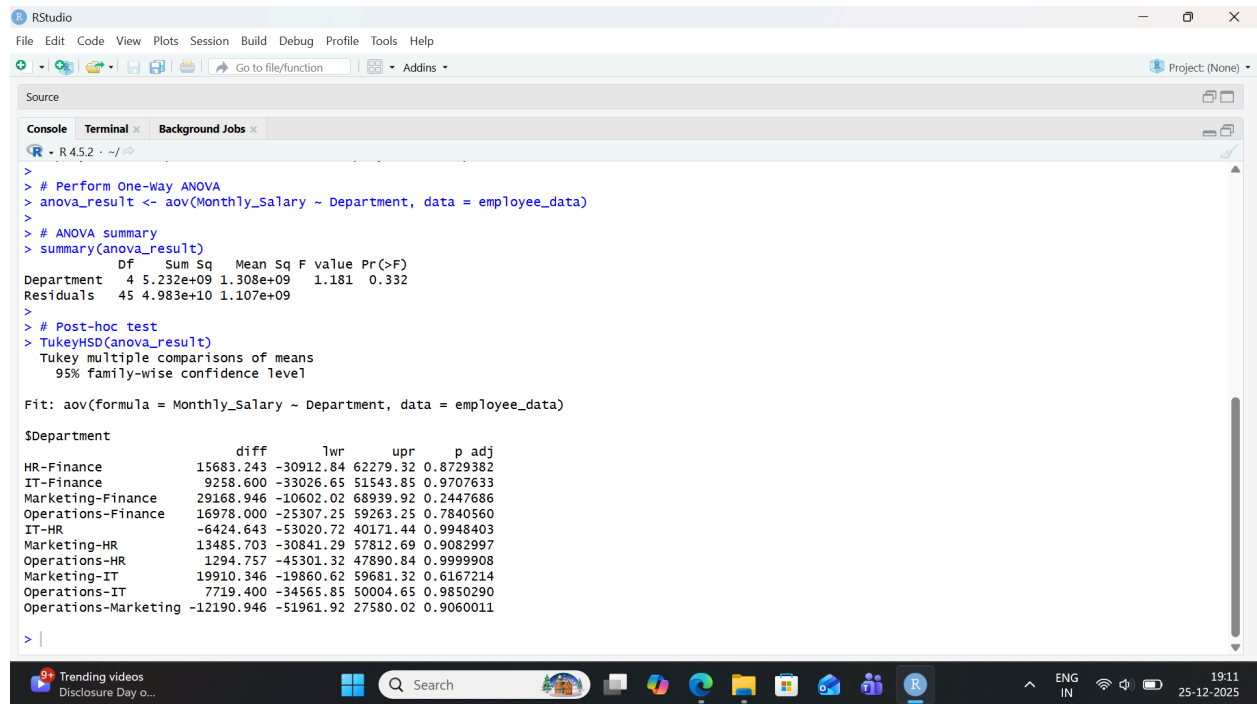
```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins Project: (None)
Source
Console Terminal Background Jobs
R - R4.5.2 - ~/
> # Load library
> library(dplyr)
>
> # Import dataset
> employee_data <- read.csv("employee_salary_dataset.csv")
>
> # View data
> head(employee_data)
  EmployeeID Name Department Experience_Years Education_Level Age Gender City Monthly_Salary
1 Employee_1 Marketing           15           Master    53 Female Delhi      111416
2 Employee_2 Operations           7           Bachelor   25 Female Bangalore    95271
3 Employee_3 IT              12           High School  51 Female Hyderabad    69064
4 Employee_4 Operations           8              PhD    44 Male   Delhi      95091
5 Employee_5 Operations          15           Master    36 Female Delhi     132450
6 Employee_6 Finance           3           High School  50 Male   Mumbai     65818
> str(employee_data)
'data.frame':   50 obs. of  9 variables:
 $ EmployeeID : int  1 2 3 4 5 6 7 8 9 10 ...
 $ Name       : chr  "Employee_1" "Employee_2" "Employee_3" "Employee_4" ...
 $ Department : chr  "Marketing" "Operations" "IT" "Operations" ...
 $ Experience_Years: int  15 7 12 8 15 3 14 17 4 18 ...
 $ Education_Level: chr  "Master" "Bachelor" "High School" "PhD" ...
 $ Age         : int  53 25 51 44 36 50 57 34 53 28 ...
 $ Gender      : chr  "Female" "Female" "Female" "Male" ...
 $ City        : chr  "Delhi" "Bangalore" "Hyderabad" "Delhi" ...
 $ Monthly_Salary: int  111416 95271 69064 95091 132450 65818 70525 44830 42429 31893 ...
>
> # Convert Department to factor
> employee_data$Department <- as.factor(employee_data$Department)
>
> # Perform One-Way ANOVA
> anova_result <- aov(Monthly_Salary ~ Department, data = employee_data)
```

NAME : SHUBHAM SANJAY KARAPE

ROLL NO : S085

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The screenshot shows the RStudio interface with the console pane active. The console displays the execution of an ANOVA test and a post-hoc TukeyHSD test. The ANOVA results show a significant effect of Department on Monthly_Salary (F = 1.181, p = 0.332). The post-hoc test shows that the difference in salary between HR-Finance and IT-Finance is significant (p = 0.8729382).

```
> # Perform One-way ANOVA
> anova_result <- aov(Monthly_Salary ~ Department, data = employee_data)
> # ANOVA summary
> summary(anova_result)
              Df Sum Sq Mean Sq F value Pr(>F)
Department    4 5.232e+09 1.308e+09   1.181  0.332
Residuals   45 4.983e+10 1.107e+09
> # Post-hoc test
> TukeyHSD(anova_result)
  Tukey multiple comparisons of means
    95% family-wise confidence level

Fit: aov(formula = Monthly_Salary ~ Department, data = employee_data)

$Department
      diff      twr      upr    p adj
HR-Finance 15683.243 -30912.84 62279.32 0.8729382
IT-Finance  9258.600 -33026.65 51543.85 0.9707633
Marketing-Finance 29168.946 -10602.02 68939.92 0.2447686
Operations-Finance 16978.000 -25307.25 59263.25 0.7840560
IT-HR      -6424.643 -53020.72 40171.44 0.9948403
Marketing-HR 13485.703 -30841.29 57812.69 0.9082997
Operations-HR 1294.757 -45301.32 47890.84 0.9999908
Marketing-IT 19910.346 -19860.62 59681.32 0.6167214
Operations-IT  7719.400 -34565.85 50004.65 0.9850290
Operations-Marketing -12190.946 -51961.92 27580.02 0.9060011
> |
```

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ROLL NO : S085