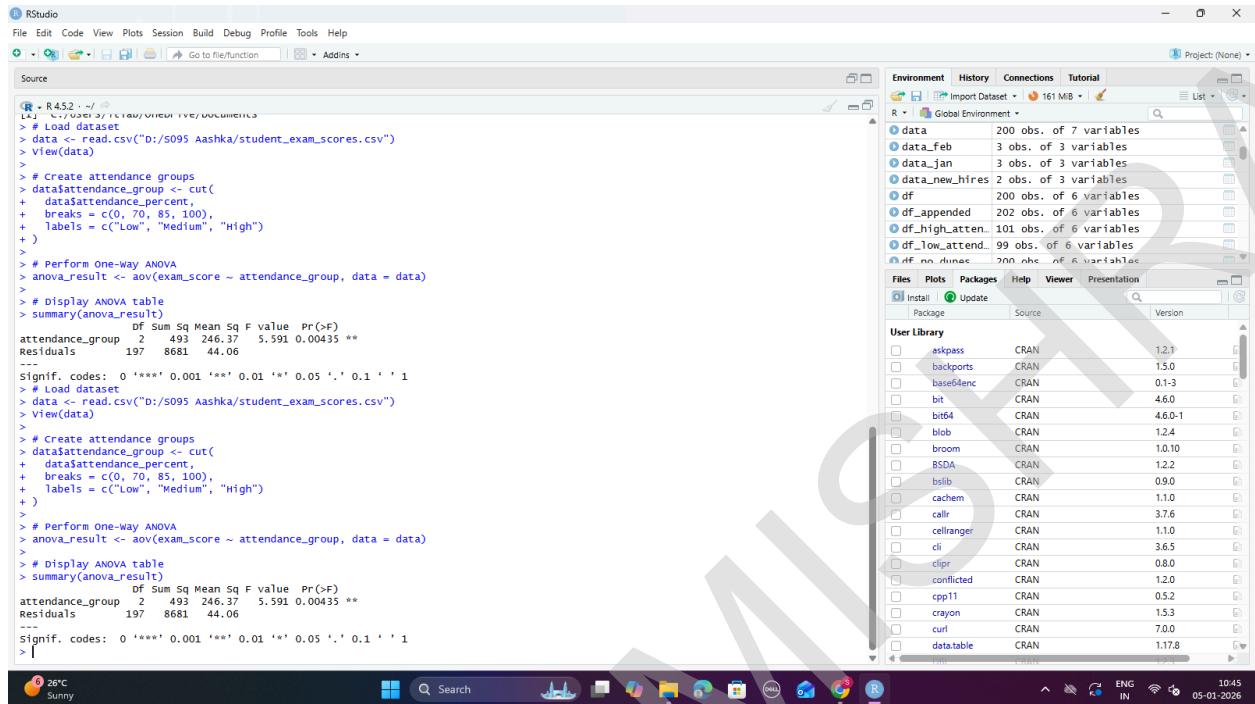


SHEETH L.U.J. AND SIR M.V. COLLEGE  
SUBJECT: DATA ANALYSIS WITH R  
PRACTICAL NO. 7 TO 9 MOD 2

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



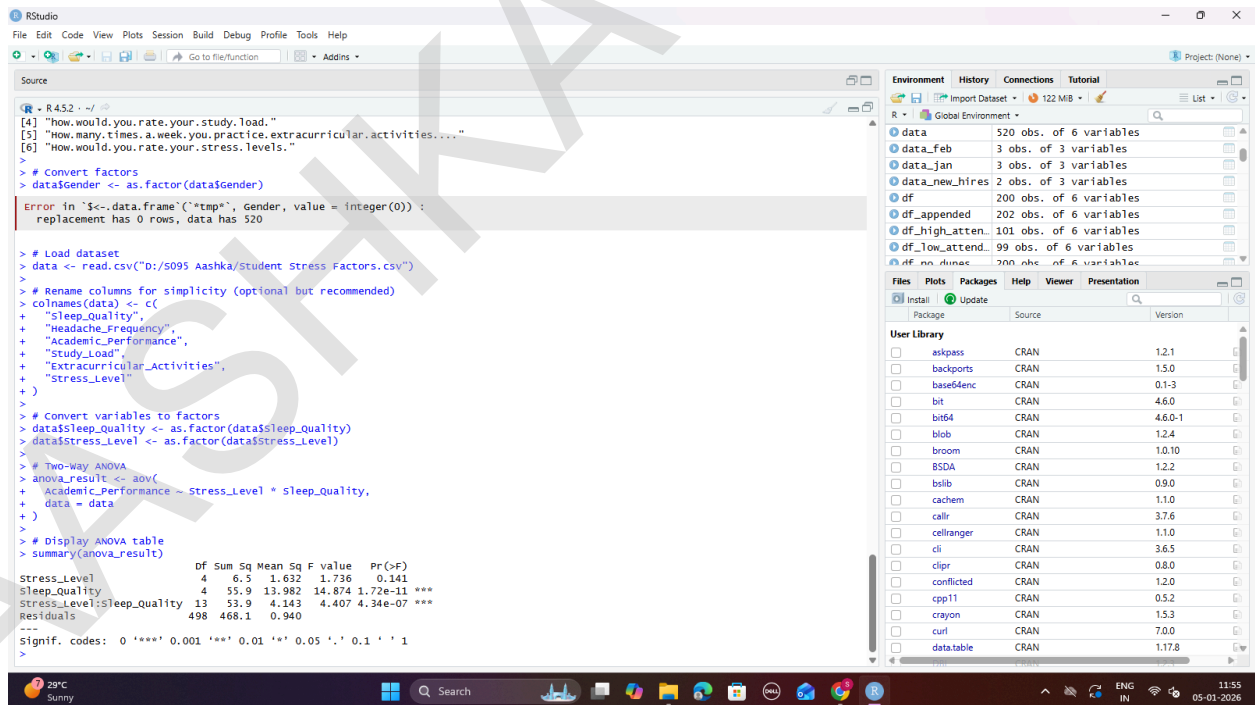
```
R - R452 ~ /
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins
Source
R - R452 ~ /
[1] "Load dataset"
> data <- read.csv("D:/S095 Aashka/student_exam_scores.csv")
> View(data)
> # Create attendance groups
> data$attendance_group <- cut(
+ data$attendance_percent,
+ breaks = c(0, 70, 85, 100),
+ labels = c("Low", "Medium", "High")
+ )
> # Perform One-way ANOVA
> anova_result <- aov(exam_score ~ attendance_group, data = data)
> # Display ANOVA table
> summary(anova_result)

      Df Sum Sq Mean Sq F value    Pr(>F)
attendance_group  2    493   246.37    5.591 0.00435 **
Residuals       197   8681    44.06
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

# Load dataset
> data <- read.csv("D:/S095 Aashka/student_exam_scores.csv")
> View(data)
> # Create attendance groups
> data$attendance_group <- cut(
+ data$attendance_percent,
+ breaks = c(0, 70, 85, 100),
+ labels = c("Low", "Medium", "High")
+ )
> # Perform One-way ANOVA
> anova_result <- aov(exam_score ~ attendance_group, data = data)
> # Display ANOVA table
> summary(anova_result)

      Df Sum Sq Mean Sq F value    Pr(>F)
attendance_group  2    493   246.37    5.591 0.00435 **
Residuals       197   8681    44.06
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> |
```

AIM:8. Performing two-way ANOVA using aov() (R).



```
R - R452 ~ /
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins
Source
R - R452 ~ /
[4] "How.would.you.rate.your.study.load."
[5] "How.many.times.a.week.you.practice.extracurricular.activities...."
[6] "How.would.you.rate.your.stress.levels."
> # Convert factors
> data$gender <- as.factor(data$gender)
Error in "$->.data.frame('temp', gender, value = integer(0)) :
replacement has 0 rows, data has 520
> # Load dataset
> data <- read.csv("D:/S095 Aashka/student Stress Factors.csv")
> # Rename columns for simplicity (optional but recommended)
> colnames(data) <- c(
+ "Sleep_Quality",
+ "Headache_Frequency",
+ "Academic_Performance",
+ "Study_Load",
+ "Extracurricular_Activities",
+ "Stress_Level"
+ )
> # Convert variables to factors
> data$Sleep_Quality <- as.factor(data$Sleep_Quality)
> data$Stress_Level <- as.factor(data$Stress_Level)
> # Two-way ANOVA
> anova_result <- aov(
+ Academic_Performance ~ Stress_Level * Sleep_Quality,
+ data = data
+ )
> # Display ANOVA table
> summary(anova_result)

      Df Sum Sq Mean Sq F value    Pr(>F)
Stress_Level  4    6.5    1.632    1.736    0.141
Sleep_Quality  4   55.9   13.982   14.874 1.72e-11 ***
Stress_Level:Sleep_Quality 13   53.9    4.143    4.407 4.34e-07 ***
Residuals     498   468.1    0.940
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> |
```

NAME: AASHKA MISHRA  
ROLL NO: S095

# SHETH L.U.J. AND SIR M.V. COLLEGE

## SUBJECT: DATA ANALYSIS WITH R

### AIM:9. Conducting Chi-square tests using chisq.test() (R)

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help

Source
R - R4.52 ~ /
> # Load dataset
> data <- read.csv("D:/S095 Aashka/Student Mental health.csv")
>
> # view column names
> colnames(data)
[1] "rimestamp" "Choose.your.gender" "what.is.your.course." "what.is.your.cgpa." "Your.current.year.of.Study" "Marital.status" "Do.you.have.Depression." "Do.you.have.Anxiety." "Did.you.seek.any.specialist.for.a.treatment."
>
> # Convert variables to factors
> data$gender <- as.factor(data$gender)
Error in '$<-data.frame'(*tmp*, gender, value = integer(0)) :
replacement has 0 rows, data has 101

> # Load dataset
> data <- read.csv("D:/S095 Aashka/Student Mental health.csv")
>
> # Convert variables to factors
> data$Choose.your.gender <- as.factor(data$Choose.your.gender)
> data$Do.you.have.Depression. <- as.factor(data$Do.you.have.Depression.)
>
> # Create contingency table
> table_data <- table(
+ data$Choose.your.gender,
+ data$Do.you.have.Depression.
+ )
>
> # Perform Chi-Square test
> chi_result <- chisq.test(table_data)
>
> # Display result
> chi_result

Pearson's Chi-squared test with Yates' continuity correction

data: table_data
X-squared = 1.4409, df = 1, p-value = 0.23
> |
```

Environment History Connections Tutorial

Global Environment

Variable	Class	Length	Mode	Summary
avg_exam_score	num	[1:10]	26	25 10 34 30 23 28 29 2...
avg_price	num	[1:10]	22	24 19 31 27 21 26 28 2...
difference	num	[1:10]	12	
group1	num	[1:10]	26	25 10 34 30 23 28 29 2...
group2	num	[1:10]	22	24 19 31 27 21 26 28 2...
max_study_hou...	num	[1:10]	12	
product	num	[1:10]	12	
quotient	num	[1:10]	12	
sample_data	num	[1:10]	26	25 10 34 30 23 28 29 2...
sum	num	[1:10]	12	
table_data	'table'	int [1:2, 1:2]	46	20 29 6

User Library

Package	Source	Version
askpass	CRAN	1.2.1
backports	CRAN	1.5.0
base64enc	CRAN	0.1-3
bit	CRAN	4.6.0
bit64	CRAN	4.6.0-1
blob	CRAN	1.2.4
broom	CRAN	10.10
BSDA	CRAN	1.2.2
bslib	CRAN	0.9.0
cachem	CRAN	1.1.0
callr	CRAN	3.7.6
cellranger	CRAN	1.1.0
cli	CRAN	3.6.5
clipr	CRAN	0.8.0
conflicted	CRAN	1.2.0
cpp11	CRAN	0.5.2
crayon	CRAN	1.5.3
curl	CRAN	7.0.0
data.table	CRAN	1.17.8

### TYPE 1: INDEPENDENCE

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help

Source
R - R4.52 ~ /
> # Load dataset
> data <- read.csv("D:/S095 Aashka/winequality-red.csv")
>
> # Create table
> indeptable <- table(gender, grades)
Error: object 'grades' not found

> # Create categorical alcohol variable
> wine$alcohol_level <- ifelse(wine$alcohol >= 10, "High", "Low")
Error: object 'wine' not found

> chisq.test(table1)
Error: object 'table1' not found

> wine$alcohol_level <- ifelse(wine$alcohol >= 10, "High", "Low")
Error: object 'wine' not found

> wine <- read.csv("D:/S095 Aashka/winequality-red.csv")
> head(wine)
  fixed.acidity volatile.acidity citric.acid residual.sugar chlorides free.sulfur.dioxide total.sulfur.dioxide density pH
1         7.4             0.70         0.00           1.9      0.076           11             34 0.9978 3.51
2         7.8             0.88         0.00           2.6      0.098           25             67 0.9968 3.20
3         7.8             0.76         0.04           2.3      0.092           54             54 0.9970 3.26
4        11.2             0.28         0.56           1.9      0.075           17             60 0.9980 3.16
5         7.4             0.70         0.00           1.9      0.076           11             34 0.9978 3.51
6         7.4             0.66         0.00           1.8      0.075           13             40 0.9978 3.51

  sulphates alcohol quality
1    0.56    9.4      5
2    0.68    9.8      5
3    0.65    9.8      5
4    0.58    9.8      6
5    0.56    9.4      5
6    0.56    9.4      5

> wine$alcohol_level <- ifelse(wine$alcohol >= 10, "High", "Low")
```

Environment History Connections Tutorial

Global Environment

Variable	Class	Length	Mode	Summary		
avg_exam_score	num	[1:10]	26	25 10 34 30 23 28 29 2...		
avg_price	num	[1:10]	22	24 19 31 27 21 26 28 2...		
difference	num	[1:10]	12			
gender	chr	[1:12]	"Male"	"Female"	"Male"	"F..."
group1	num	[1:10]	26	25 10 34 30 23 28 29 2...		
group2	num	[1:10]	22	24 19 31 27 21 26 28 2...		
max_study_hou...	num	[1:10]	12			

User Library

Package	Source	Version
askpass	CRAN	1.2.1
backports	CRAN	1.5.0
base64enc	CRAN	0.1-3
bit	CRAN	4.6.0
bit64	CRAN	4.6.0-1
blob	CRAN	1.2.4
broom	CRAN	10.10
BSDA	CRAN	1.2.2
bslib	CRAN	0.9.0
cachem	CRAN	1.1.0
callr	CRAN	3.7.6
cellranger	CRAN	1.1.0
cli	CRAN	3.6.5
clipr	CRAN	0.8.0
conflicted	CRAN	1.2.0
cpp11	CRAN	0.5.2
crayon	CRAN	1.5.3
curl	CRAN	7.0.0
data.table	CRAN	1.17.8

NAME: AASHKA MISHRA  
ROLL NO: S095

# SHETH L.U.J. AND SIR M.V. COLLEGE

## SUBJECT: DATA ANALYSIS WITH R

### TYPE 2: GOODNESS OF FIT

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
R - R4.5.2 - ~/
> indep_table <- table(gender, grades)
Error: object 'grades' not found

> # Create categorical alcohol variable
> winesalcohol_level <- ifelse(winesalcohol >= 10, "High", "Low")
Error: object 'wine' not found

> chisq.test(table1)
Error: object 'table1' not found

> winesalcohol_level <- ifelse(winesalcohol >= 10, "High", "Low")
Error: object 'wine' not found

> wine <- read.csv("D:/S095 Aashka/winequality-red.csv")
> head(wine)
  fixed.acidity volatile.acidity citric.acid residual.sugar chlorides free.sulfur.dioxide total.sulfur.dioxide density pH
1      7.4      0.70      0.00      1.9      0.076      11      34      0.9978 3.51
2      7.8      0.88      0.00      2.6      0.098      25      67      0.9968 3.20
3      7.8      0.76      0.04      2.3      0.092      15      54      0.9970 3.26
4     11.2      0.28      0.56      1.9      0.075      17      60      0.9980 3.16
5      7.4      0.70      0.00      1.9      0.076      11      34      0.9978 3.51
6      7.4      0.66      0.00      1.8      0.075      13      40      0.9978 3.51

  sulphates alcohol quality
1    0.56    9.4    5
2    0.68    9.8    5
3    0.65    9.8    5
4    0.58    9.8    6
5    0.56    9.4    5
6    0.56    9.4    5

> winesalcohol_level <- ifelse(winesalcohol >= 10, "High", "Low")
> observed <- table(winesalcohol)
> observed
 3  4  5  6  7  8
10 53 681 638 199 18
> |

Environment History Connections Tutorial
R - Global Environment
Values
avg_exam_score 33.955
avg_price 5016.97063037249
difference 10
gender chr [1:12] "Male" "Female" "Male" "F..."
group1 num [1:10] 26 25 10 34 30 23 28 29 2...
group2 num [1:10] 22 24 19 31 27 21 26 28 2...
max_study_hou... 12
observed 'table' int [1:6(1d)] 10 53 681 638 ...

Files Plots Packages Help Viewer Presentation
Package Install Update Source Version
User Library
askpass CRAN 1.2.1
backports CRAN 1.5.0
base64enc CRAN 0.1-3
bit CRAN 4.6.0
bit64 CRAN 4.6.0-1
blob CRAN 1.2.4
broom CRAN 10.10
BSDA CRAN 1.2.2
bslib CRAN 0.9.0
cachem CRAN 1.1.0
callr CRAN 3.7.6
cellranger CRAN 1.1.0
cli CRAN 3.6.5
clipr CRAN 0.8.0
conflicted CRAN 1.2.0
cpp11 CRAN 0.5.2
crayon CRAN 1.5.3
curl CRAN 7.0.0
data.table CRAN 1.17.8
```

### TYPE 3: HOMOGENEITY

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Source
R - R4.5.2 - ~/
> chisq.test(table1)
Error: object 'table1' not found

> winesalcohol_level <- ifelse(winesalcohol >= 10, "High", "Low")
Error: object 'wine' not found

> wine <- read.csv("D:/S095 Aashka/winequality-red.csv")
> head(wine)
  fixed.acidity volatile.acidity citric.acid residual.sugar chlorides free.sulfur.dioxide total.sulfur.dioxide density pH
1      7.4      0.70      0.00      1.9      0.076      11      34      0.9978 3.51
2      7.8      0.88      0.00      2.6      0.098      25      67      0.9968 3.20
3      7.8      0.76      0.04      2.3      0.092      15      54      0.9970 3.26
4     11.2      0.28      0.56      1.9      0.075      17      60      0.9980 3.16
5      7.4      0.70      0.00      1.9      0.076      11      34      0.9978 3.51
6      7.4      0.66      0.00      1.8      0.075      13      40      0.9978 3.51

  sulphates alcohol quality
1    0.56    9.4    5
2    0.68    9.8    5
3    0.65    9.8    5
4    0.58    9.8    6
5    0.56    9.4    5
6    0.56    9.4    5

> winesalcohol_level <- ifelse(winesalcohol >= 10, "High", "Low")
> observed <- table(winesalcohol)
> observed
 3  4  5  6  7  8
10 53 681 638 199 18
> |

> homo_table <- table(winequality, winesalcohol_level)
> homo_table
      High Low
3      4    6
4     29   24
5    235  446
6    446  192
7    188   11
8     17    1
> |

Environment History Connections Tutorial
R - Global Environment
Values
avg_exam_score 33.955
avg_price 5016.97063037249
difference 10
gender chr [1:12] "Male" "Female" "Male" "F..."
group1 num [1:10] 26 25 10 34 30 23 28 29 2...
group2 num [1:10] 22 24 19 31 27 21 26 28 2...
homo_table 'table' int [1:6, 1:2] 4 29 235 446 ...
max_study_hou... 12
observed 'table' int [1:6(1d)] 10 53 681 638 ...

Files Plots Packages Help Viewer Presentation
Package Install Update Source Version
User Library
askpass CRAN 1.2.1
backports CRAN 1.5.0
base64enc CRAN 0.1-3
bit CRAN 4.6.0
bit64 CRAN 4.6.0-1
blob CRAN 1.2.4
broom CRAN 10.10
BSDA CRAN 1.2.2
bslib CRAN 0.9.0
cachem CRAN 1.1.0
callr CRAN 3.7.6
cellranger CRAN 1.1.0
cli CRAN 3.6.5
clipr CRAN 0.8.0
conflicted CRAN 1.2.0
cpp11 CRAN 0.5.2
crayon CRAN 1.5.3
curl CRAN 7.0.0
data.table CRAN 1.17.8
```

NAME: AASHKA MISHRA  
ROLL NO: S095