Angeles City Science High School

Research 10

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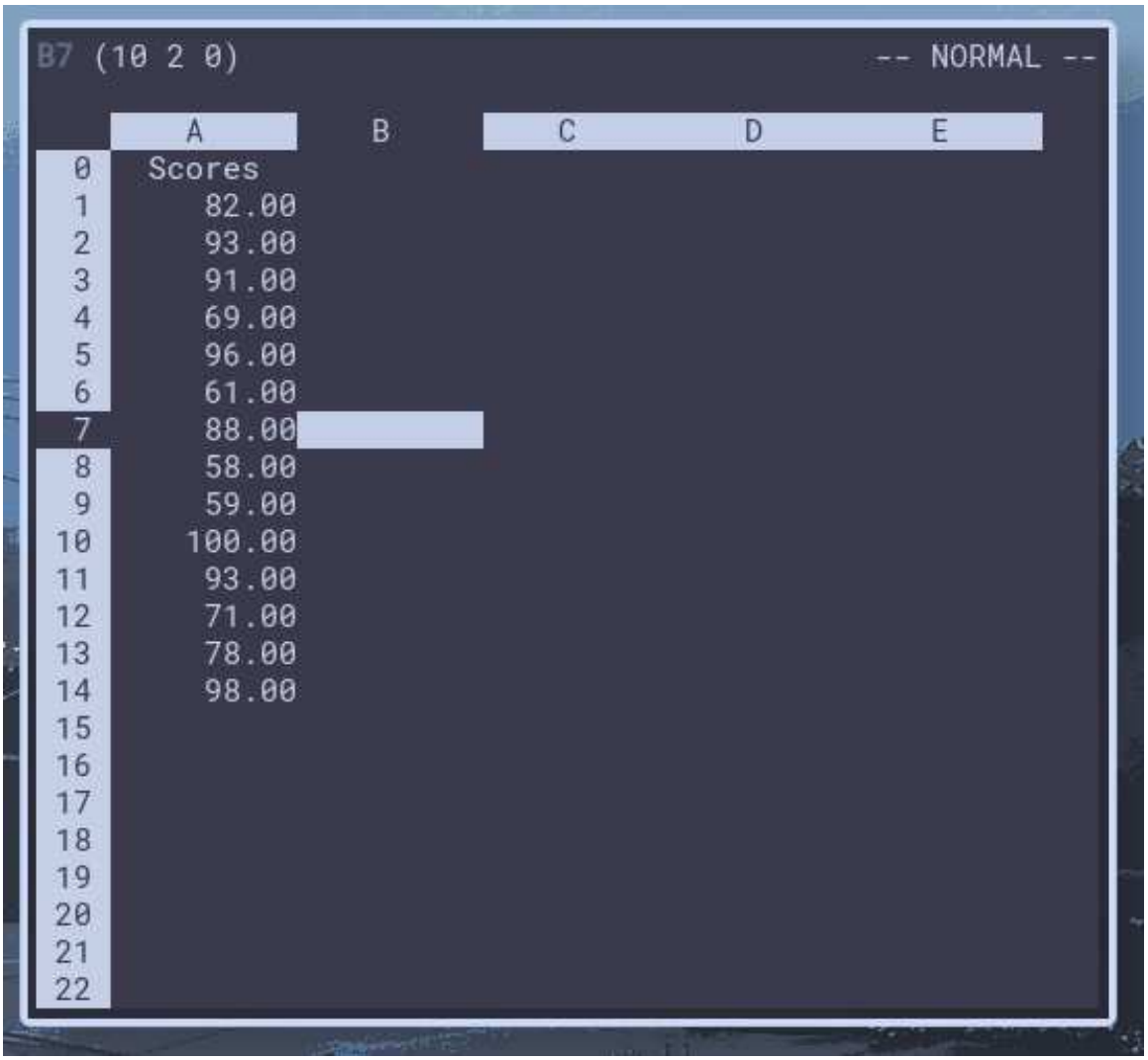
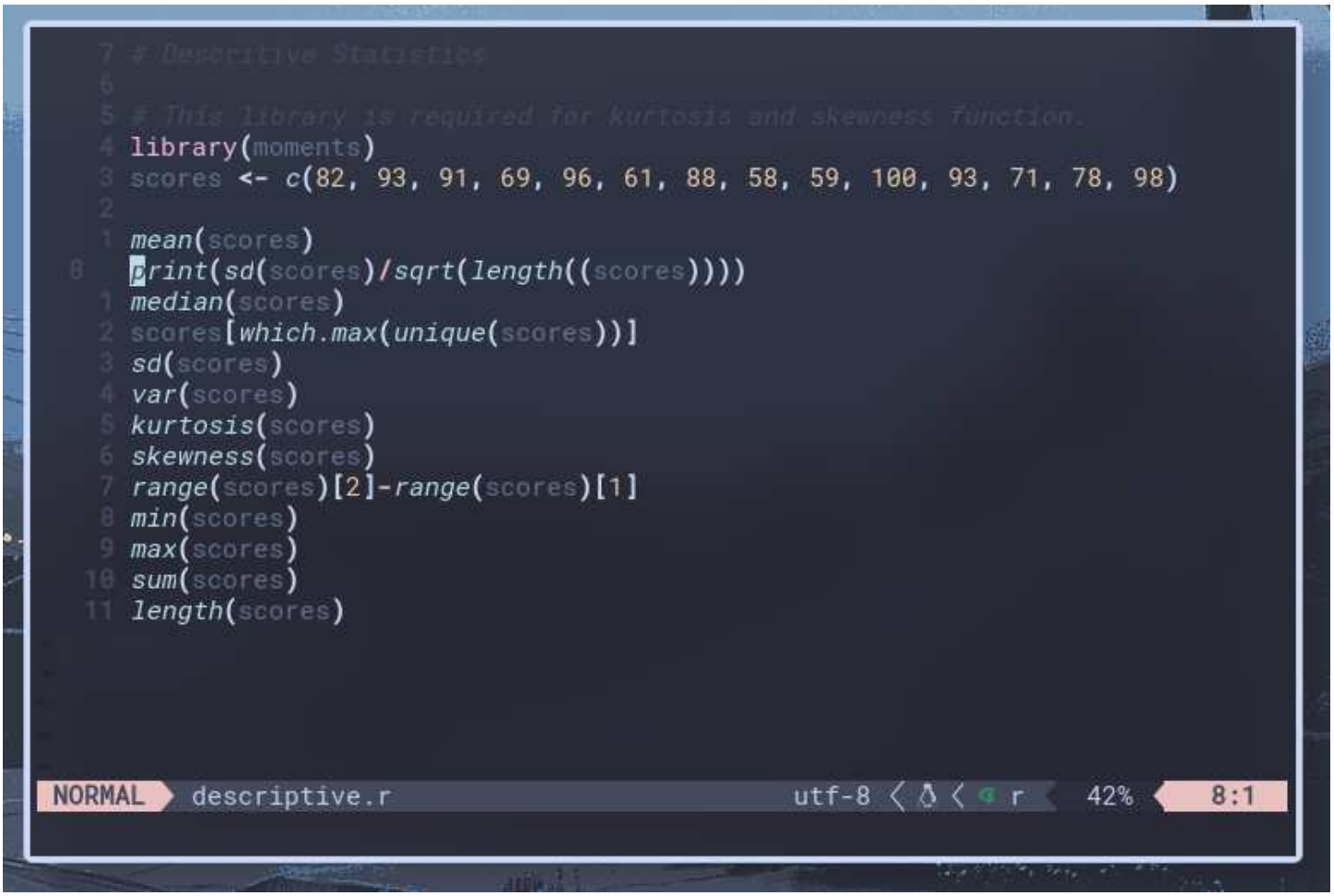
Descriptive analysis

Data spreadsheet:

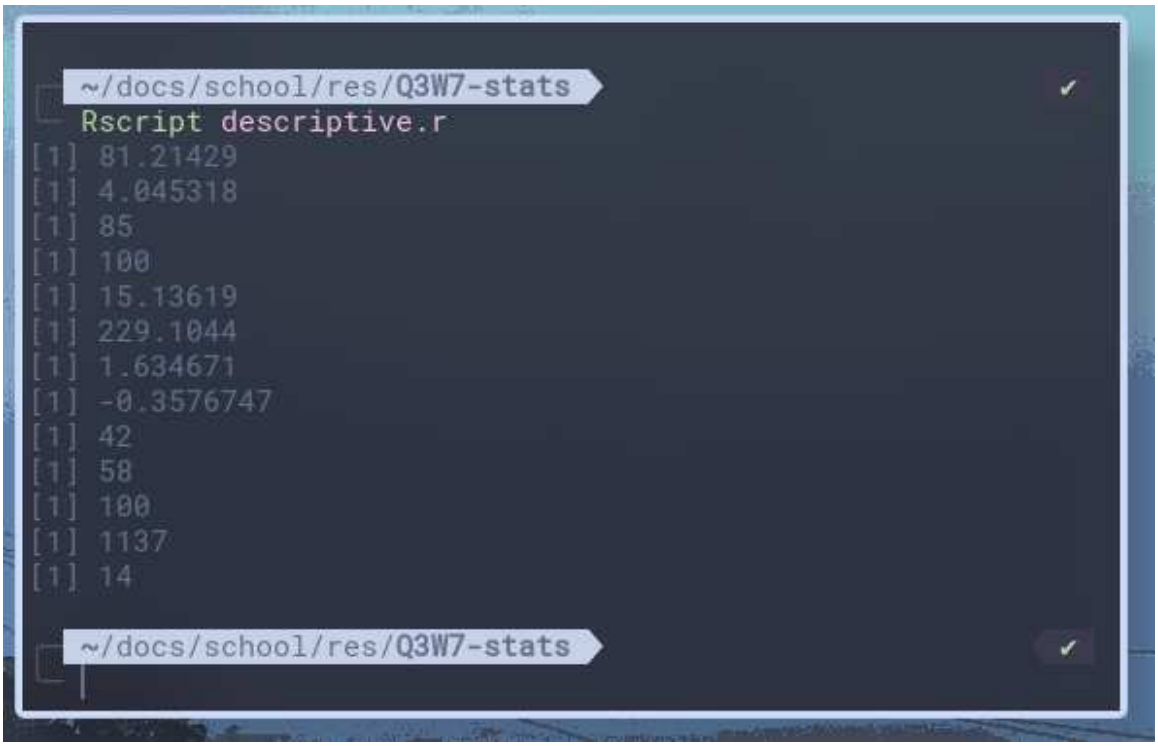


Code:



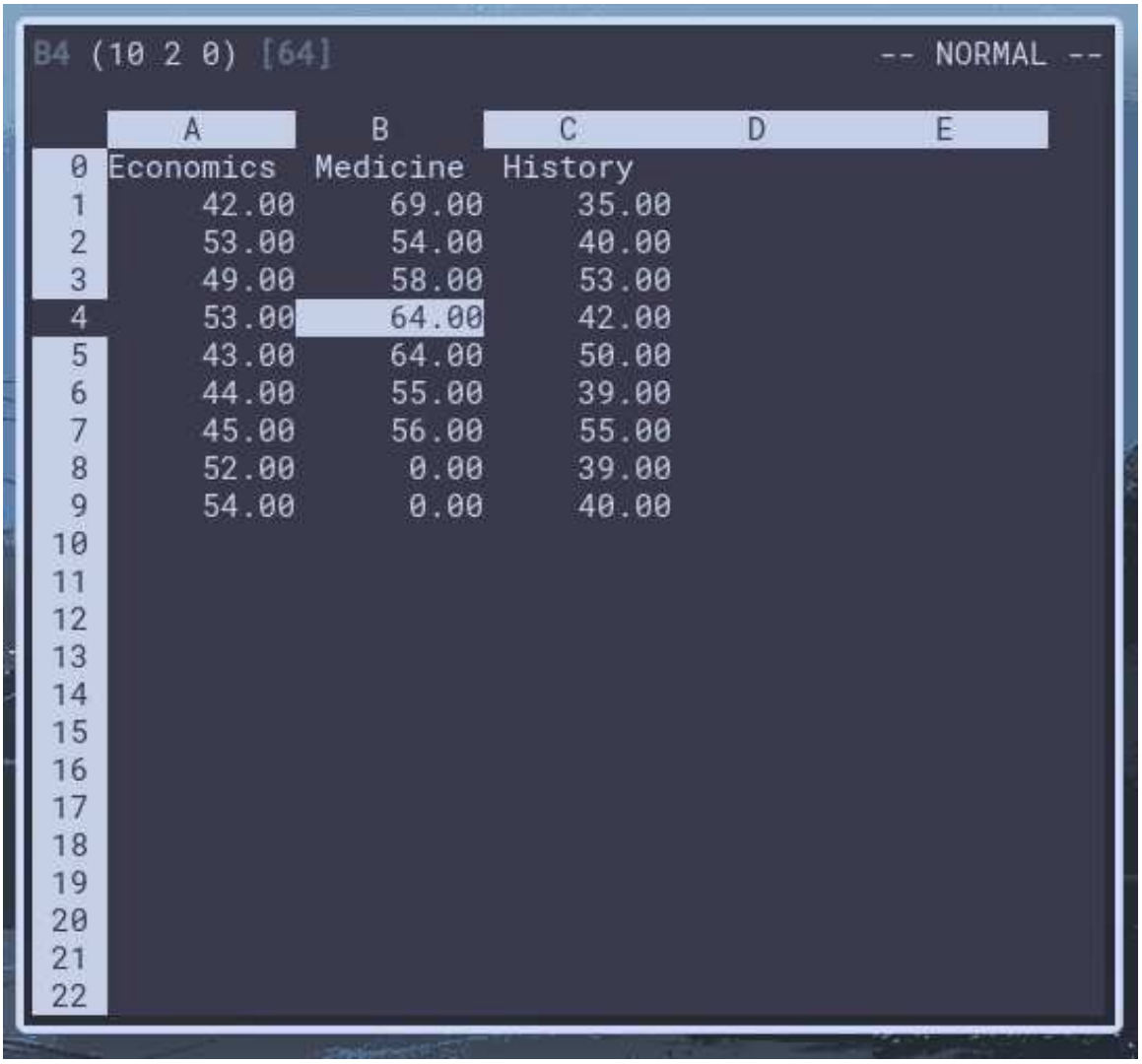
```r
# Descriptive Statistics

# This library is required for kurtosis and skewness function.
library(moments)
scores <- c(82, 93, 91, 69, 96, 61, 88, 58, 59, 100, 93, 71, 78, 98)

mean(scores)
print(sd(scores)/sqrt(length((scores))))
median(scores)
scores[which.max(unique(scores))]
sd(scores)
var(scores)
kurtosis(scores)
skewness(scores)
range(scores)[2]-range(scores)[1]
min(scores)
max(scores)
sum(scores)
length(scores)
```

Result:


~/docs/school/res/Q3W7-stats
Rscript descriptive.r
[1] 81.21429
[1] 4.045318
[1] 85
[1] 100
[1] 15.13619
[1] 229.1044
[1] 1.634671
[1] -0.3576747
[1] 42
[1] 58
[1] 100
[1] 1137
[1] 14
~/docs/school/res/Q3W7-stats

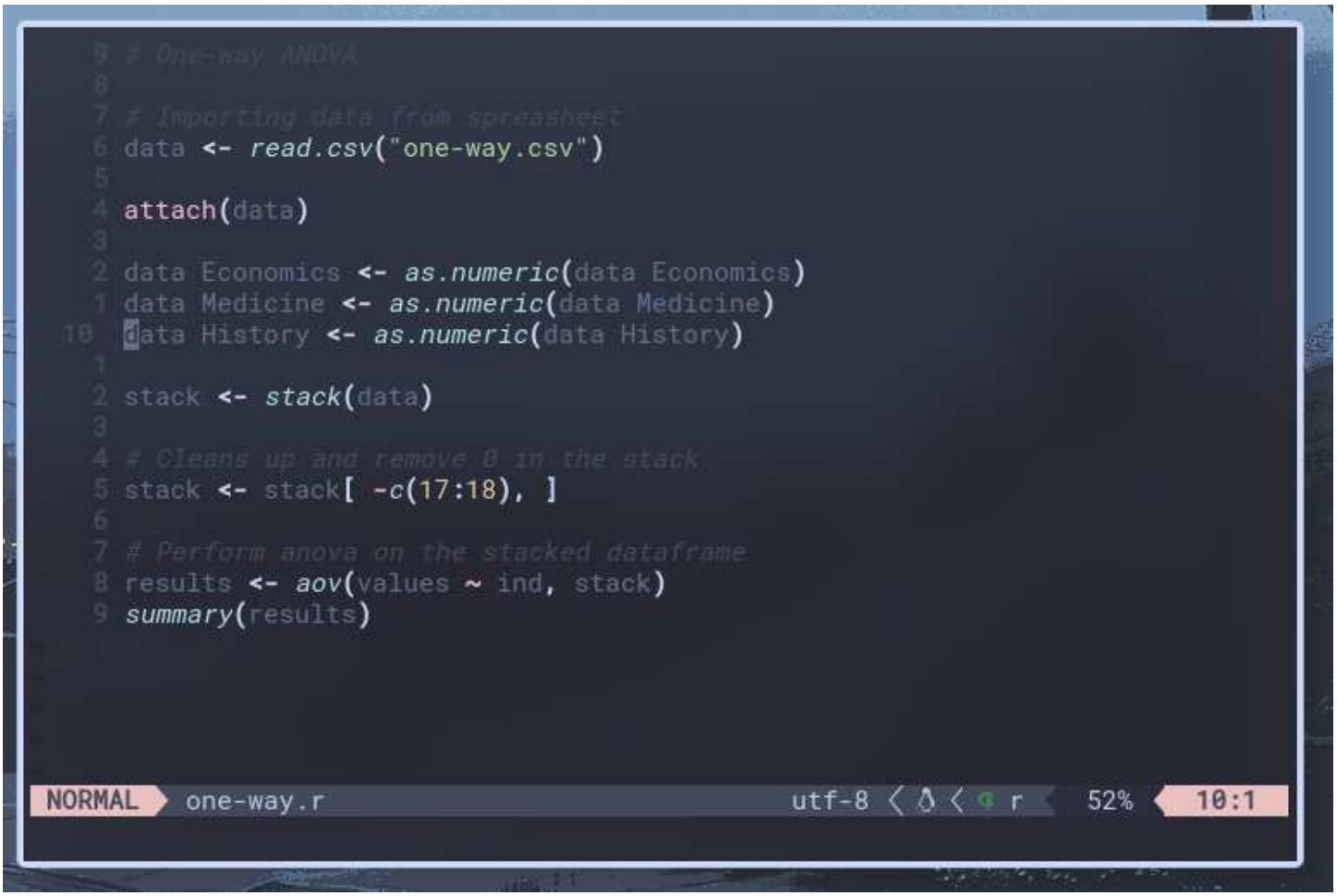
One-way ANOVA

Data spreadsheet:



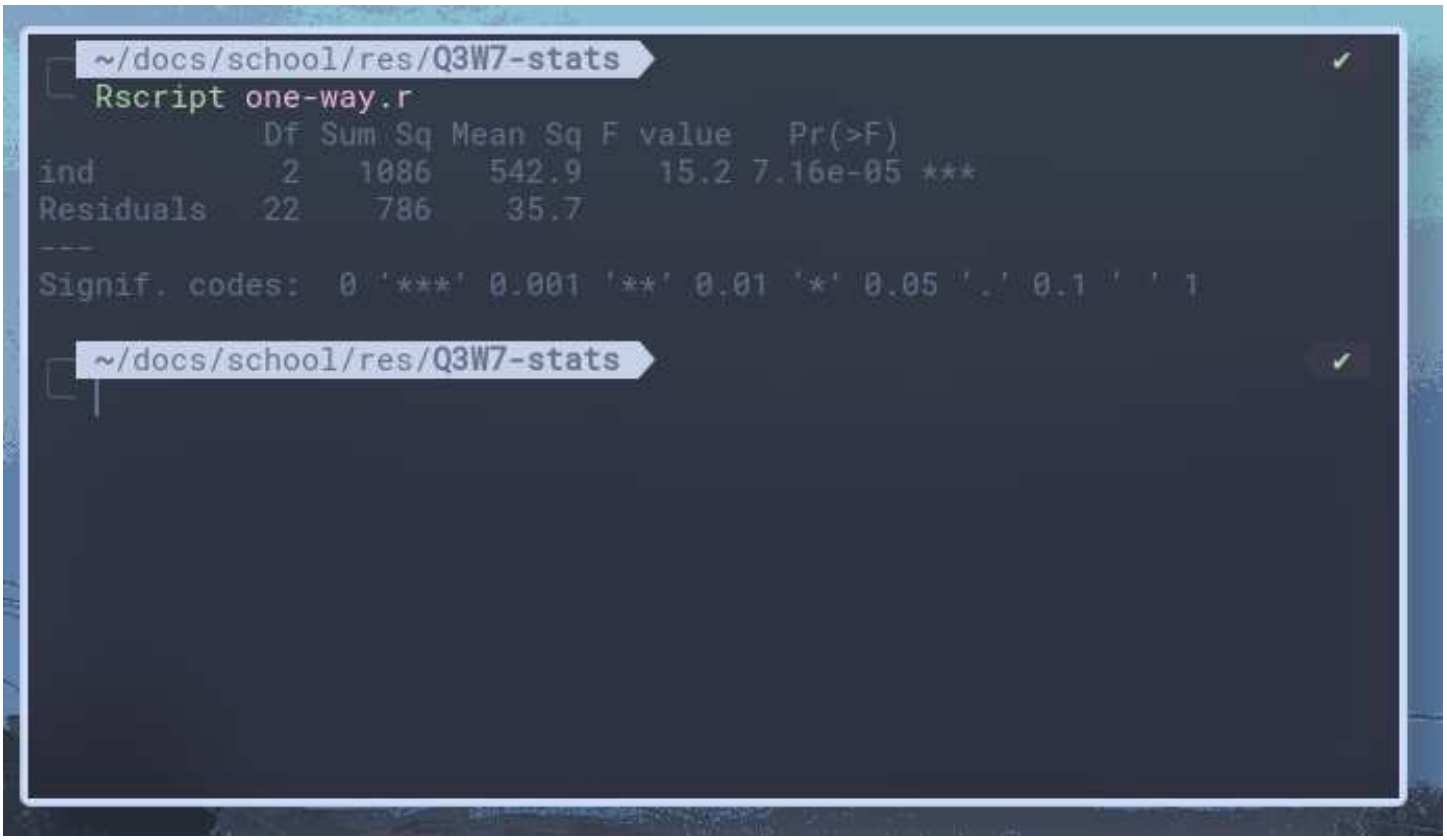
	A	B	C	D	E
0	Economics	Medicine	History		
1	42.00	69.00	35.00		
2	53.00	54.00	40.00		
3	49.00	58.00	53.00		
4	53.00	64.00	42.00		
5	43.00	64.00	50.00		
6	44.00	55.00	39.00		
7	45.00	56.00	55.00		
8	52.00	0.00	39.00		
9	54.00	0.00	40.00		
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

Code:



```r
# One-way ANOVA

# Importing data from spreasheet
data <- read.csv("one-way.csv")

attach(data)

data Economics <- as.numeric(data Economics)
data Medicine <- as.numeric(data Medicine)
data History <- as.numeric(data History)

stack <- stack(data)

# Cleans up and remove 0 in the stack
stack <- stack[ -c(17:18), ]

# Perform anova on the stacked dataframe
results <- aov(values ~ ind, stack)
summary(results)
```

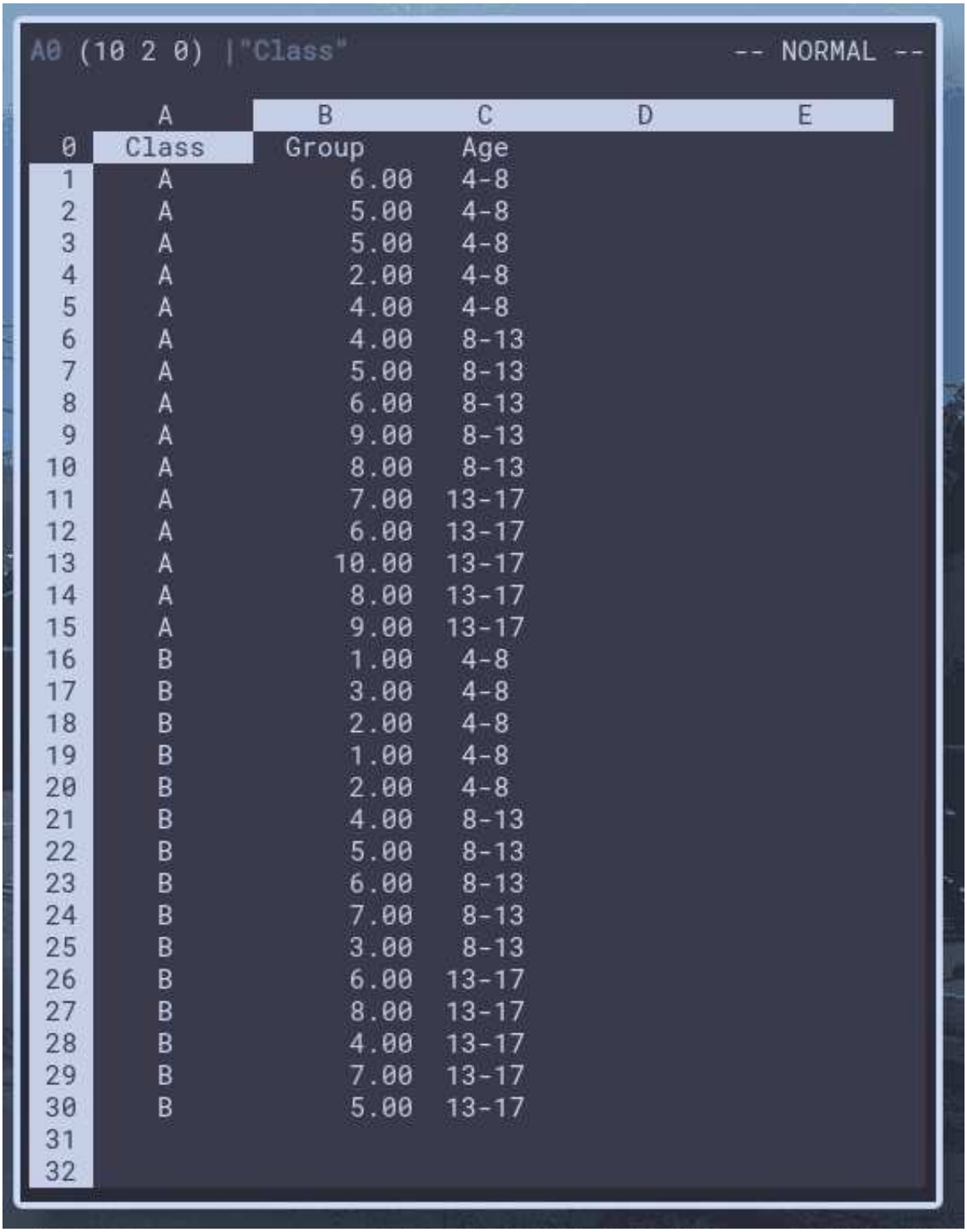
Result:


~/docs/school/res/Q3W7-stats
Rscript one-way.r
Df Sum Sq Mean Sq F value Pr(>F)
ind 2 1086 542.9 15.2 7.16e-05 ***
Residuals 22 786 35.7

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
~/docs/school/res/Q3W7-stats

Two-way ANOVA

Data spreadsheet:

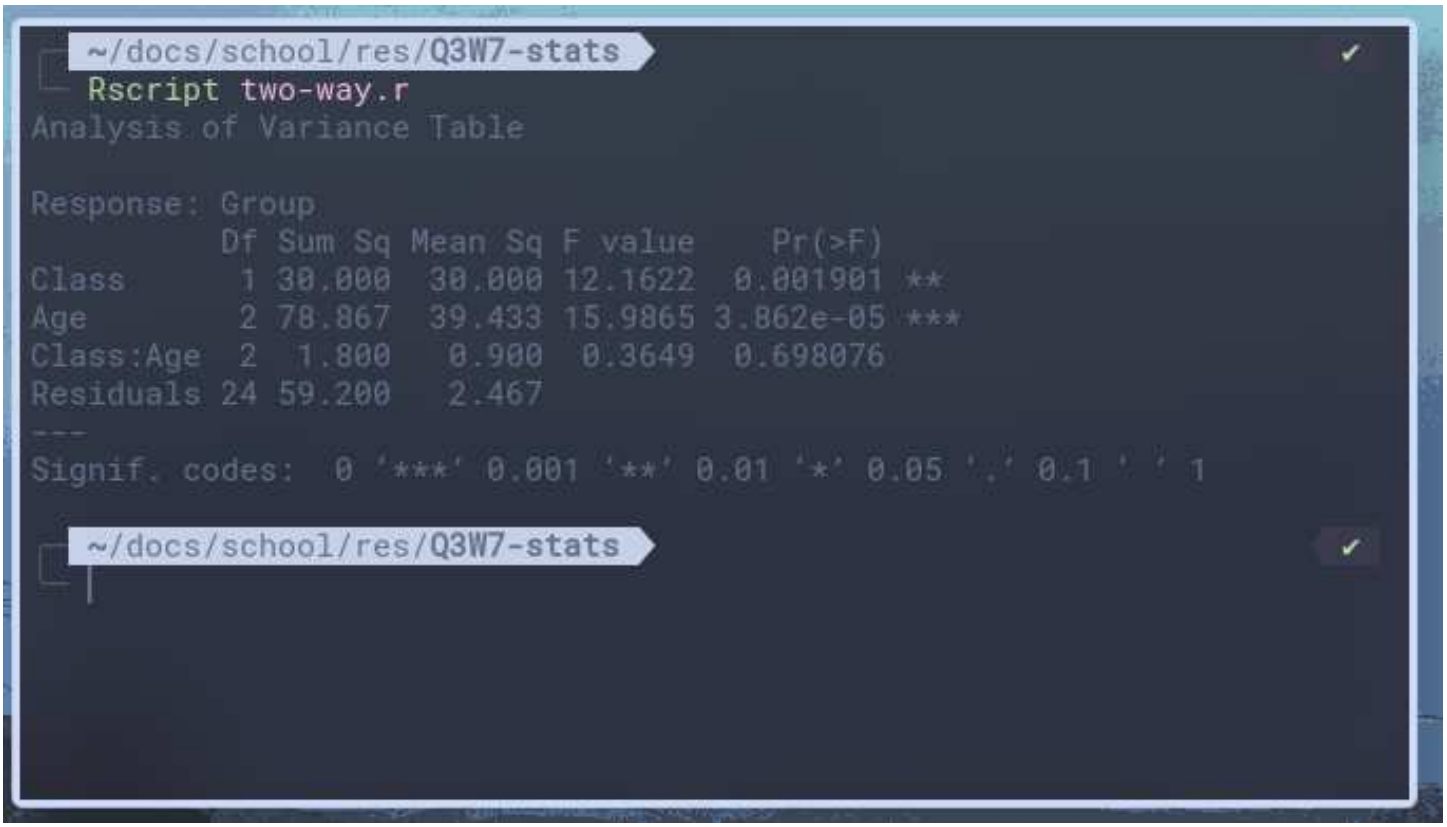


	A	B	C	D	E
0	Class	Group	Age		
1	A	6.00	4-8		
2	A	5.00	4-8		
3	A	5.00	4-8		
4	A	2.00	4-8		
5	A	4.00	4-8		
6	A	4.00	8-13		
7	A	5.00	8-13		
8	A	6.00	8-13		
9	A	9.00	8-13		
10	A	8.00	8-13		
11	A	7.00	13-17		
12	A	6.00	13-17		
13	A	10.00	13-17		
14	A	8.00	13-17		
15	A	9.00	13-17		
16	B	1.00	4-8		
17	B	3.00	4-8		
18	B	2.00	4-8		
19	B	1.00	4-8		
20	B	2.00	4-8		
21	B	4.00	8-13		
22	B	5.00	8-13		
23	B	6.00	8-13		
24	B	7.00	8-13		
25	B	3.00	8-13		
26	B	6.00	13-17		
27	B	8.00	13-17		
28	B	4.00	13-17		
29	B	7.00	13-17		
30	B	5.00	13-17		
31					
32					

Code:

```r
#Statistical tool: Two-way anova

data <- read.csv("two-way.csv")

# Renaming columns
attach(data)

# Convert two columns to factors in two-way anova
# Class and Age as the factors to the group
data Class <- as.factor(data Class)
data Age <- as.factor(data Age)

# Perform two way anova with Class and age
# as factors
anova(aov(Group~Class*Age, data = data))
```

Result:



Fill in the blanks: The F is larger than the F-crit, thus, the null hypothesis is rejected. This implies that music and age have a significance on the results of the students.