

Chap6_2

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First, set working directory. 'data' is a table with two columns and same number of rows, and should be numeric. Columns have headers indicating the names of the variables. **User will also input desired variable names in double quotes**

```
data <- read.csv("chap6_2.csv", header = FALSE, skip = 1)
colnames(data) <- c("No_Cont", "Cont_before", "Cont_after", "Part_cont")
```

We now combine the observations into one long column (score)

```
colnames(data) <- c("V1", "V2", "V3", "V4")
score=c(data$V1,data$V2,data$V3,data$V4)
```

We generate a second column (levels), that identifies the group for each score. **User will also input desired variable names in double quotes**

```
levels=factor(c(rep("No_cont",5),rep("Cont_before",5),
               rep("Cont_after",5),rep("Part_cont",5)))
```

We now use the means of the respective groups as the predictors

```
Predictors=c(rep(mean(data$V1),5),rep(mean(data$V2),5),
              rep(mean(data$V3),5),rep(mean(data$V4),5))
```

We now form a data frame for the Regression approach, and print the results

```
data_reg=data.frame(Predictors,score)
r=cor(Predictors,score)
knitr::kable(xtable(data_reg))
```

Predictors	score
3.0	3
3.0	3
3.0	2
3.0	4
3.0	3
7.0	5
7.0	9
7.0	8
7.0	4
7.0	9
3.2	2
3.2	4
3.2	5
3.2	4
3.2	1
4.2	5
4.2	4

Predictors	score
4.2	3
4.2	5
4.2	4

```
print(r)
```

```
## [1] 0.7585388
```

Now we perform the regression analysis on the data

```
reg1=lm(score~Predictors)
```

We now form a data frame with the dependent variable and the factors, then print the table.

```
data=data.frame(score=score,group=levels)
knitr::kable(xtable(data))
```

score	group
3	No_cont
3	No_cont
2	No_cont
4	No_cont
3	No_cont
5	Cont_before
9	Cont_before
8	Cont_before
4	Cont_before
9	Cont_before
2	Cont_after
4	Cont_after
5	Cont_after
4	Cont_after
1	Cont_after
5	Part_cont
4	Part_cont
3	Part_cont
5	Part_cont
4	Part_cont

We now generate the ANOVA table and regression analysis based on the linear model

```
aov1=aov(score~levels)
print(model.tables(aov(score~levels),type = "means"),digits=3)
```

```
## Tables of means
```

```
## Grand mean
```

```
##
```

```
## 4.35
```

```
##
```

```
## levels
```

```
## levels
```

```
## Cont_after Cont_before No_cont Part_cont
```

```
##          3.2          7.0          3.0          4.2
```

```
summary(aov1)
```

```
##              Df Sum Sq Mean Sq F value    Pr(>F)
## levels         3  50.95   16.98    7.227 0.00278 **
## Residuals      16  37.60    2.35
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
summary(reg1)
```

```
##
## Call:
## lm(formula = score ~ Predictors)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -3.00  -1.05   0.00   0.85   2.00
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.0000     0.9382   0.000 1.000000
## Predictors    1.0000     0.2025   4.939 0.000106 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.445 on 18 degrees of freedom
## Multiple R-squared:  0.5754, Adjusted R-squared:  0.5518
## F-statistic: 24.39 on 1 and 18 DF,  p-value: 0.000106
```