

Chap6

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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.csv", header = FALSE, skip = 1)
colnames(data) <- c("Expt", "Control")
```

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

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

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("Expt",5),rep("Control",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))
```

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
4	1
4	2
4	5
4	6
4	6
10	8
10	8
10	9
10	11
10	14

```
print(r)
```

```
## [1] 0.8075729
```

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
1	Expt
2	Expt
5	Expt
6	Expt
6	Expt
8	Control
8	Control
9	Control
11	Control
14	Control

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
##
## 7
##
## levels
## levels
## Control Expt
## 10 4
```

```
summary(aov1)
```

```
##           Df Sum Sq Mean Sq F value    Pr(>F)
## levels      1     90      90      15 0.00472 **
## Residuals    8     48       6
## ---
## 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  -2.00   0.00   1.75   4.00
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0000     1.9664   0.000  1.00000
## Predictors    1.0000     0.2582   3.873  0.00472 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##  
## Residual standard error: 2.449 on 8 degrees of freedom  
## Multiple R-squared:  0.6522, Adjusted R-squared:  0.6087  
## F-statistic:    15 on 1 and 8 DF,  p-value: 0.004721
```