# Comprobación de Resultados

Gabriel Morales

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### Datos para Regresión Múltiple

| Recorrido asignado | $x_1$ = Millas recorridas | $x_2$ = Cantidad de entregas | $y$ = Tiempo de recorrido(horas) |
|---|---|---|---|
| 1 | 100 | 4 | 9.3 |
| 2 | 50 | 3 | 4.8 |
| 3 | 100 | 4 | 8.9 |
| 4 | 100 | 2 | 6.5 |
| 5 | 50 | 2 | 4.2 |
| 6 | 80 | 2 | 6.2 |
| 7 | 75 | 3 | 7.4 |
| 8 | 65 | 4 | 6.0 |
| 9 | 90 | 3 | 7.6 |
| 10 | 90 | 2 | 6.1 |

```
x1=c(100,50,100,100,50,80,75,65,90,90);
x2=c(4,3,4,2,2,2,3,4,3,2);
y=c(9.3,4.8,8.9,6.5,4.2,6.2,7.4,6.0,7.6,6.1);

reg = lm(y~x1+x2)

summary(reg)
```

```
##
## Call:
## lm(formula = y ~ x1 + x2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.79875 -0.32477  0.06333  0.29739  0.91333
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.868701   0.951548  -0.913 0.391634
## x1           0.061135   0.009888   6.182 0.000453 ***
## x2           0.923425   0.221113   4.176 0.004157 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 0.5731 on 7 degrees of freedom
## Multiple R-squared:  0.9038, Adjusted R-squared:  0.8763
## F-statistic: 32.88 on 2 and 7 DF,  p-value: 0.0002762
```

$$b_0 = -0.8687015$$
$$b_1 = 0.0611346$$
$$b_2 = 0.9234254$$

## Comprobación

1. Creamos una matrix con los valores x1 y x2

```
x=matrix(c(1,1,1,1,1,1,1,1,1,1,100,50,100,100,50,80,75,65,90,90,4,3,4,2,2,2,3,4,3,2),
         nrow = 10)
# Matrix X
x
```

```
##       [,1] [,2] [,3]
##  [1,]    1  100    4
##  [2,]    1   50    3
##  [3,]    1  100    4
##  [4,]    1  100    2
##  [5,]    1   50    2
##  [6,]    1   80    2
##  [7,]    1   75    3
##  [8,]    1   65    4
##  [9,]    1   90    3
## [10,]    1   90    2
```

2. Aplicamos la formula

$$b = (X^T * X)^{-1} * (X^T * Y)$$

```
b=(solve(t(x)%*%x))%*%t(x)%*%y
```

3. Resultados

```
##             [,1]
## [1,] -0.8687015
## [2,]  0.0611346
## [3,]  0.9234254
```

$$b_0 = -0.8687015$$
$$b_1 = 0.0611346$$
$$b_2 = 0.9234254$$