## > summary( lm(SALARY ~ PUB, data = lab4) )

## Regression table:

```
Call: Im(formula = SALARY ~ PUB, data = lab4)
```

Residuals:

```
Median
            1Q
Min
                               3Q
                                       Max
                    697.2 7456.6 20322.9
-21638.8 -8327.3
                                  Sb0
Coefficients:
              Estimate Std. Error
                                   t value
                          2511.7
                                     19.09
(Intercept)
               47940.4
                                              < 2e-16
                                             2.58e-11
                1148.2
                           146.1
                                     7.86
PUB
                                Significantly differ from zero
```

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9707 on 73 degrees of freedom

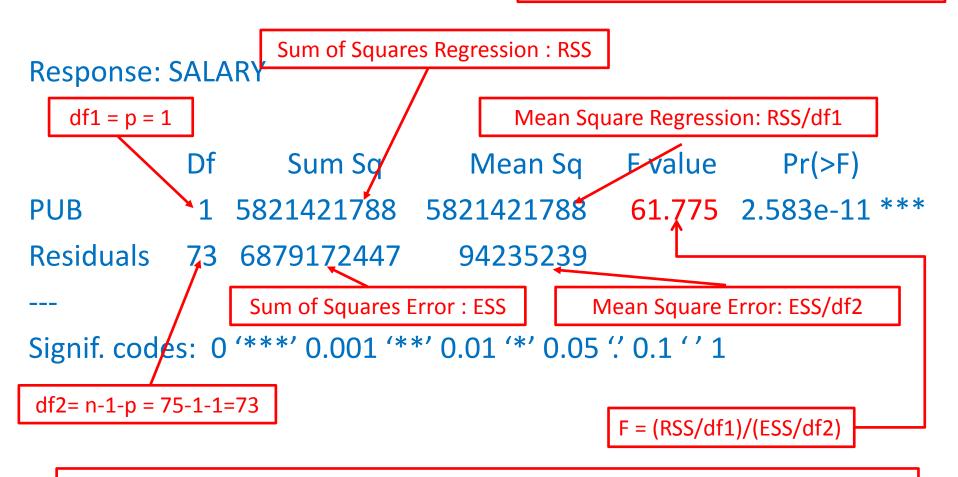
Multiple R-squared: 0.4584, Adjusted R-squared: 0.4509

F-statistic: 61.78 on 1 and 73 DF, p-value: 2.583e-11

## > anova( lm(SALARY ~ PUB, data = lab4) )

Analysis of Variance Table

 $R^2 = RSS/TSS = RSS/(RSS+ESS)$ 



A significant F-value means that X can account for a substantial proportion of variation in Y statistically. Statistically!

```
> vcov( lm(SALARY ~ PUB, data= lab4) )
```

Variance/Covariance matrix:

```
(Intercept) PUB
(Intercept) 6308830.5 -328359.66
PUB -328359.7 21340.53
```

The square root of the diagonals is same as "standard error" in the regression table.

```
> vcov.lab4<- vcov( lm(SALARY ~ PUB, data= lab4) )
> sqrt(diag( vcov.lab4 ) )
```

```
Sы (Intercept) PUB / Sы 146.084
```

> confint ( lm(SALARY ~ PUB, data= lab4) )

Confidence interval (CI):

We believe that the probability is 0.95 that:

- (1)The "true value of bo" would be between 42934.46 and 52946.24.
- (2) The "true value of b1" would be between 857.04 and 1439.33.

CI is another version of hypothesis testing. If the null hypothesized value does not fall in the interval, we would reject the null hypothesis.