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

Regression table:

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

Residuals:

Min	1Q	Median	3Q	Max
-21638.8	-8327.3	697.2	7456.6	20322.9

Coefficients:

$\hat{b}_0$ — S_{b0}

	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	47940.4	2511.7	19.09	< 2e-16	***
PUB	1148.2	146.1	7.86	2.58e-11	***

S_{b1}

$\hat{b}_1$

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)

Response: SALARY

Sum of Squares Regression : RSS

df1 = p = 1

Mean Square Regression: RSS/df1

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
PUB	1	5821421788	5821421788	61.775	2.583e-11 ***
Residuals	73	6879172447	94235239		

Sum of Squares Error : ESS

Mean Square Error: ESS/df2

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

df2= n-1-p = 75-1-1=73

F = (RSS/df1)/(ESS/df2)

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 ) )
```

	(Intercept)	PUB
	2511.739	146.084

S_{b0} S_{b1}

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

Confidence interval (CI) :

	2.5 %	97.5 %
(Intercept)	42934.4632	52946.239
PUB	857.0364	1439.326

CI for b_0

CI for b_1

We believe that the probability is 0.95 that:

(1)The "true value of b_0" would be between 42934.46 and 52946.24.

(2)The "true value of b_1" 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.