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Week 3 Homework Assignment

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Amos B Robinson · a month ago

Effect of Smoking on Systolic Blood Pressure
Number of obs = 32
F(1, 30) = 1.95
Prob > F = 0.1723
Under the Naive Model the blood pressure is 144. So because the "F" statistic is so low, there is not convincing evidence that smoking has a statistical significance on SBP. This is confirmed on the "F" statistic because the "P" value for the "F" statistic is .1723, which is above the critical value of .05 for a 95% confidence level. Additionally, the R-squared for this regression is 0.0612, which further confirms that the statistical impact of smoking on blood pressure is minimal.

Effect of Body Size on Systolic Blood Pressure
Number of obs = 32
F(1, 30) = 36.75
Prob > F = 0.0000
R-squared = 0.5506
Under the Naive Model the blood pressure is 144. Here the "F" statistic is very large and the associated "P" value is < than .0000. So there is convincing evidence that body size has a statistically significant effect on systolic blood pressure. The high coefficient of determination "R-squared" shows that QUET explains about 55% of SBP.

Effect of AGE on Body Size
Number of obs = 32
F(1, 30) = 54.37
Prob > F = 0.0000
R-squared = 0.6444
The mean body size of this sample is 3.44. However, there is convincing evidence that age does effect body size. The "F" statistic is large at 54.37 and the associated "P" value is less than .0000. The R-squared shows that age explains 64.44% of body size.

Effect of Age on Systolic Blood Pressure
Number of obs = 32
F(1, 30) = 45.18
Prob > F = 0.0000
R-squared = 0.6009
The Naive Model for SBP is 144. The "F" statistic is 45.18, which is pretty large. The corresponding "P" value for this "F" statistic is less than .0000. So there is convincing evidence that age does have

an impact on systolic blood pressure.

5 · flag

Kahsay Tadesse · a month ago

well done, great

0 · flag

+ Comment

Kahsay Tadesse · a month ago

am not clear about the culculation on :"**Effect of Body Size on Systolic Blood Press**

0 · flag

+ Comment


KK Wong · a month ago

1. SBP vs SMK

```
. reg SBP SMK

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =    1.95
       Model |  393.098162     1  393.098162           Prob > F      =  0.1723
    Residual |  6032.87059    30  201.095686           R-squared     =  0.0612
-------------+------------------------------           Adj R-squared =  0.0299
       Total |  6425.96875    31  207.289315           Root MSE      =  14.181

------------------------------------------------------------------------------
         SBP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         SMK |   7.023529   5.023498     1.40   0.172    -3.235823    17.28288
       _cons |      140.8   3.661472    38.45   0.000     133.3223    148.2777
```

Given relatively small F(1,30)=1.95, high Prob>F=0.1723 and low adj R-squared=0.0299, it suggests to reject the hypothesis that SBP has an association with SMK; ie, the association between SBP & SMK is approx 2.99% as suggested by the adj R-squared. It further supports by the fact that SMK 95% CI contains 0 and its P>|t|=0.172 which is significantly away from 0.

2. SBP vs QUET

```
. reg SBP QUET

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   36.75
       Model |  3537.94574     1  3537.94574           Prob > F      =  0.0000
    Residual |  2888.02301    30  96.2674337           R-squared     =  0.5506
-------------+------------------------------           Adj R-squared =  0.5356
       Total |  6425.96875    31  207.289315           Root MSE      =  9.8116

------------------------------------------------------------------------------
         SBP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        QUET |   21.49167   3.545147     6.06   0.000     14.25151    28.73182
       _cons |    70.5764   12.32187     5.73   0.000     45.41179    95.74101
```

Given relatively high F(1,30)=36.75, significantly low Prob>F=0.0000 and high adj R-squared=0.5356, it suggests not to reject the hypothesis that SBP vs QUET; ie, the association between SBP & QUET is approx 53.56% as suggested by the adj R-squared. It further supports by the fact that QUET 95% CI does not contains 0 and its P>|t|=0.000.

3. QUET vs AGE

. reg QUET AGE

Source	SS	df	MS
Model	4.93597143	1	4.93597143
Residual	2.72371329	30	.090790443
Total	7.65968472	31	.247086604

Number of obs	=	32
F(1, 30)	=	54.37
Prob > F	=	0.0000
R-squared	=	0.6444
Adj R-squared	=	0.6326
Root MSE	=	.30131

QUET	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
AGE	.0573642	.0077799	7.37	0.000	.0414755	.0732529
_cons	.3864519	.4176903	0.93	0.362	-.4665855	1.239489

Given relatively high F(1,30)=54.37, significantly low Prob>F=0.0000 and high adj R-squared=0.6326, it suggests not to reject the hypothesis that QUET vs AGE; ie, the association between QUET & AGE is approx 63.26% as suggested by the adj R-squared. It further supports by the fact that AGE 95% CI does not contains 0 and its P>|t|=0.000.

4. SBP vs AGE

. reg SBP AGE

Source	SS	df	MS
Model	3861.63037	1	3861.63037
Residual	2564.33838	30	85.4779458
Total	6425.96875	31	207.289315

Number of obs	=	32
F(1, 30)	=	45.18
Prob > F	=	0.0000
R-squared	=	0.6009
Adj R-squared	=	0.5876
Root MSE	=	9.2454

SBP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
AGE	1.6045	.2387159	6.72	0.000	1.116977	2.092023
_cons	59.09162	12.81626	4.61	0.000	32.91733	85.26592

Given relatively high F(1,30)=45.18, significantly low Prob>F=0.0000 and high adj R-squared=0.5876, it suggests not to reject the hypothesis that SMK vs AGE; ie, the association between SMK & AGE is approx 58.76% as suggested by the adj R-squared. It further supports by the fact that AGE 95% CI does not contains 0 and its P>|t|=0.000.

2 · flag

+ Comment

Juan C. Trujillo · a month ago

I am confused about this case. Could there be a possibility in which the F test turns out to be statistically significant, but the t test for the explanatory variable appears with a high p-value?

Please, explain.

0 · flag

Anonymous · a month ago

If you are testing the statistical significance of the estimate of a single regression coefficient, the inferential outcome will be the same whether you use the t-test or the F-test.

Mechanically, this is because the F-statistic associated with testing a single coefficient estimate is just squared t-statistic associated with that same estimate.

1 · flag

+ Comment

Varalakshmi · a month ago

Amos: I did the F statistic for SBP (Y) on SMK (X)
The Model with 1 d.f parameter because there is one independent variable SMK and the residual which is y and y predicted has 2 d.f one for intercept and slope. As you stated the R squared which is the explained variation to the Total variation is very little. P value so small suggests that there is a significant difference in Smoking history and SBP.

Finding the t-statistic = r/sqrt((1-r^2)/(n-2)) = 1.398459 or as is also given in the table below.
We can check that t^2 = 1.40^2 is the same as F statistic= 1.95

The lecture was quite informative!

Can someone help me to graph two scatter plots in one - Week 1 homework where we need to graph the residuals as well the given observations?

```
Source |       SS       df       MS              Number
>  of obs =      32
-------------+------------------------------           F(  1,>      30) =     1.95
       Model |  393.098162     1  393.098162           Prob >> F      =  0.1723
    Residual |  6032.87059    30  201.095686           R-squa> red     =  0.0612
-------------+------------------------------           Adj R-> squared =  0.0299
       Total |  6425.96875    31  207.289315           Root MSE      =  14.181

------------------------------------------------------------------------------
         sbp |      Coef.   Std. Err.      t    P>|t|     [95 % Con
>       f. Interval]
         smk |   7.023529   5.023498     1.40   0.172    -3.2 35823
>         17.28288
       _cons |      140.8   3.661472    38.45   0.000     133 .3223
>         148.2777
--------------------------------------------------------
> ----------------
```

.

0 · flag

+ Comment

luca balestrini · a month ago

Source SS df MS Number of obs = 32

		F(1, 30)	= 1.95		
Model	393.098162	1 393.098162	Prob > F	= 0.1723	
Residual	6032.87059	30 201.095686	R-squared	= 0.0612	
		Adj R-squared	= 0.0299		
Total	6425.96875	31 207.289315	Root MSE	= 14.181	
sbp	Coef.	Std. Err. t	P>t	[95% Conf.	Interval]
smk	7.023529	5.023498 1.40	0.172	-3.235823	17.28288
_cons	140.8	3.661472 38.45	0.000	133.3223	148.2777

2)sbp on quet

Source	SS	df MS	Number of obs	= 32	
		F(1, 30)	= 36.75		
Model	3537.94585	1 3537.94585	Prob > F	= 0.0000	
Residual	2888.0229	30 96.2674299	R-squared	= 0.5506	
		Adj R-squared	= 0.5356		
Total	6425.96875	31 207.289315	Root MSE	= 9.8116	
sbp	Coef.	Std. Err. t	P>t	[95% Conf.	Interval]
quet	21.49167	3.545147 6.06	0.000	14.25151	28.73182
_cons	70.57641	12.32187 5.73	0.000	45.4118	95.74102

3)quet on age

Source	SS	df MS	Number of obs	= 32	
		F(1, 30)	= 54.37		
Model	4.93597216	1 4.93597216	Prob > F	= 0.0000	
Residual	2.72371324	30 .090790441	R-squared	= 0.6444	
		Adj R-squared	= 0.6326		
Total	7.6596854	31 .247086626	Root MSE	= .30131	
quet	Coef.	Std. Err. t	P>t	[95% Conf.	Interval]
age	.0573642	.0077799 7.37	0.000	.0414755	.0732529
_cons	.3864517	.4176903 0.93	0.362	-.4665857	1.239489

4)sbp on age

Source	SS	df MS	Number of obs	= 32	
		F(1, 30)	= 45.18		
Model	3861.63037	1 3861.63037	Prob > F	= 0.0000	
Residual	2564.33838	30 85.4779458	R-squared	= 0.6009	
		Adj R-squared	= 0.5876		
Total	6425.96875	31 207.289315	Root MSE	= 9.2454	
sbp	Coef.	Std. Err. t	P>t	[95% Conf.	Interval]
age	1.6045	.2387159 6.72	0.000	1.116977	2.092023
_cons	59.09162	12.81626 4.61	0.000	32.91733	85.26592

0 · flag

+ Comment

David C. Morris · a month ago

I got the same results as above. I'm not going to repost here. However, I was thinking about the four analyses we did. Two of them make sense to me: 1) Blood pressure (sbp) and Smoking (smk); and 2) Blood pressure (sbp) and Body size (quet). I know we're just doing the homework to learn how to run/interpret anova tables. However, it got me thinking about what 'quet' really is. The description says 'body size' but looking at the values (range from ~2 to ~4.6) I don't have any reference point for that. What is Quet? How is it measured? The reason I bring this up is I was a little surprise by the high correlation between Quet and Age. The range of age in the sample is 41 to 65. The correlation between them is R-squared .64. Looking at the scatter plot, as Age goes up, so does Quet. I would've expected it to taper off toward the older ages since people tend to lose muscle mass and usually weight the older they get. Does anyone know what QUET is? I did a Google search but only found other data sets with no description.

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+ Comment

Emilija Nikolic-Djoric · a month ago

I think that it is Quetelet's index defined as:
QUET=100*(weight/height^2)

1 · flag

+ Comment

Emilija Nikolic-Djoric · a month ago

Week 3-Slide 17-at the bottom n-2 instead n-1?

0 · flag

+ Comment

ANCA MINCIU · a month ago

I have done the test, with same results. To avoid re-posting the same information, I would just add one sentence to each interpretation.

1.**Effect of Smoking on Systolic Blood Pressure**
The confidence interval in this case contains zero, so smoking is not a good predictor for blood pressure.

2. Effect of Body Size on Systolic Blood Pressure
The confidence interval does not contain zero, so the body size influences the systolic blood pressure.

3. Effect of AGE on Body Size
The confidence interval does not contain zero, so age is a very important predictor for body size.

4. Effect of Age on Systolic Blood Pressure

Age is a very important predictor for systolic blood pressure, taking into consideration that the confidence interval does not contain zero.

1 · flag

+ Comment

Alina Denham · a month ago

Hello, everybody!

Here are my observations:

- Let's test the null hypothesis (the slope equals zero) for SBP on SMK. F=1.95 (< F.95=4.20) and p=0.1723 (>.05). Therefore, we fail to reject the null hypothesis. This means that we do not have sufficient evidence to prove that there is a significant linear relationship between blood pressure and smoking history.

- Let's test the null hypothesis (the slope equals zero) for SBP on QUET. F=36.75 (>> F.95) and p=0.000 (<0.001). Therefore, we reject the null hypothesis. This means that we have sufficient evidence to prove that there is a significant linear relationship between blood pressure and body size.

-Let's test the null hypothesis (the slope equals zero) for QUET on AGE. F=54.37 (>>F.95) and p=0.000 (<0.001). Therefore, we reject the null hypothesis. This means that we have sufficient evidence to prove that there is significant linear relationship between body size and age.

- Let's test the null hypothesis (the slope equals zero) for SBP on AGE. F=45.18 (>>F.95) and p=0.000 (<0.001). Therefore, we reject the null hypothesis. This means that we have sufficient evidence to prove that there is significant linear relationship between blood pressure and age.

2 · flag

+ Comment

Lien-yu Yeh · a month ago

Assume that,
H0:β1 equal to 0 vs H1:β1 not equal to 0

According to the rule of test with P-value,
if α>p-value,then we reject H0,and if α<p-value,we don't reject H0,where α is significant level because p-value=Pr(reject H0 ｜ H0 is true)= probibility of type I error (with sample),
when p-value is large,H0 probably be true,because there is high probability to make mistake,so we don't reject H0
when p-value is small,the probability of type I error is too low,so we reject H0

I used above concept to test following question,and I assume that significant level is

0.05(α=0.05)

```
. regress SBP SMK

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =    1.95
       Model |  393.098162     1  393.098162           Prob > F      =  0.1723
    Residual |  6032.87059    30  201.095686           R-squared     =  0.0612
-------------+------------------------------           Adj R-squared =  0.0299
       Total |  6425.96875    31  207.289315           Root MSE      =  14.18

------------------------------------------------------------------------------
         SBP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         SMK |   7.023529   5.023498     1.40   0.172    -3.235823    17.28288
       _cons |      140.8   3.661472    38.45   0.000     133.3223    148.2777
------------------------------------------------------------------------------
```

significant level=0.05 < p-value=0.1723 ,we don't reject H0:β1 equal to 0,
so we *don't have* enough evidence to refer that SBP and SMK has significant relatonship.

```
. regress SBP QUET

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   36.75
       Model |  3537.94574     1  3537.94574           Prob > F      =  0.0000
    Residual |  2888.02301    30  96.2674337           R-squared     =  0.5506
-------------+------------------------------           Adj R-squared =  0.5356
       Total |  6425.96875    31  207.289315           Root MSE      =  9.8116

------------------------------------------------------------------------------
         SBP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        QUET |   21.49167   3.545147     6.06   0.000     14.25151    28.73182
       _cons |    70.5764   12.32187     5.73   0.000     45.41179    95.74101
------------------------------------------------------------------------------
```

significant level=0.05 > p-value=0.0000 ,we reject H0:β1 equal to 0,
so we *have* enough evidence to refer that SBP and QUET has significant relatonship.

```
. regress QUET AGE

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   54.37
       Model |  4.93597143     1  4.93597143           Prob > F      =  0.0000
    Residual |  2.72371329    30  .090790443           R-squared     =  0.6444
-------------+------------------------------           Adj R-squared =  0.6326
       Total |  7.65968472    31  .247086604           Root MSE      =  .30131
```

```
------------------------------------------------------------------------------
        QUET |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         AGE |   .0573642   .0077799     7.37   0.000     .0414755    .0732529
       _cons |   .3864519   .4176903     0.93   0.362    -.4665855    1.239489
------------------------------------------------------------------------------
```

significant level=0.05 > p-value=0.0000 ,we reject H0:β1 equal to 0,
so we *have* enough evidence to refer that QUET and AGE has significant relatonship.

```
. regress SBP AGE

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   45.18
       Model |  3861.63037     1  3861.63037           Prob > F      =  0.0000
    Residual |  2564.33838    30  85.4779458           R-squared     =  0.6009
-------------+------------------------------           Adj R-squared =  0.5876
       Total |  6425.96875    31  207.289315           Root MSE      =  9.2454

------------------------------------------------------------------------------
         SBP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         AGE |     1.6045   .2387159     6.72   0.000     1.116977    2.092023
       _cons |   59.09162   12.81626     4.61   0.000     32.91733    85.26592
------------------------------------------------------------------------------
```

significant level=0.05 > p-value=0.0000 ,we reject H0:β1 equal to 0,
so we *have* enough evidence to refer that SBP and AGE has significant relatonship.

0 · flag

+ Comment

Walter O. Augenstein · a month ago

1. SBP(Y) vs. SMK(X)

```
. regress sbp smk

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =    1.95
       Model |  393.098162     1  393.098162           Prob > F      =  0.1723
    Residual |  6032.87059    30  201.095686           R-squared     =  0.0612
-------------+------------------------------           Adj R-squared =  0.0299
       Total |  6425.96875    31  207.289315           Root MSE      =  14.181

------------------------------------------------------------------------------
         sbp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
         smk |   7.023529   5.023498     1.40   0.172    -3.235823    17.28288
       _cons |      140.8   3.661472    38.45   0.000     133.3223    148.2777
------------------------------------------------------------------------------
```

invFtail(1, 30, 0.05) = 4.1708768, but F = 1.95 => we cannot reject the Null hypothesis.
The regression line explains 6% of the total squared variation.
We cannot establish a relationship of sbp to smk.

2. SBP(Y) vs. QUET(x)

. regress sbp quet

```
      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   36.75
       Model |  3537.94585     1  3537.94585           Prob > F      =  0.0000
    Residual |   2888.0229    30  96.2674299           R-squared     =  0.5506
-------------+------------------------------           Adj R-squared =  0.5356
       Total |  6425.96875    31  207.289315           Root MSE      =  9.8116


------------------------------------------------------------------------------
         sbp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        quet |   21.49167   3.545147     6.06   0.000     14.25151    28.73182
       _cons |   70.57641   12.32187     5.73   0.000      45.4118    95.74102
------------------------------------------------------------------------------
```

invFtail(1, 30, 0.05) = 4.1708768, and F = 36.75 => we reject the Null hypothesis.
The regression line explains 55%% of the total squared variation.
There is a definite linear component to the regression of sbp on quet.

3. QUET(Y) vs. AGE(X)

. regress quet age

```
      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   54.37
       Model |  4.93597216     1  4.93597216           Prob > F      =  0.0000
    Residual |  2.72371324    30  .090790441           R-squared     =  0.6444
-------------+------------------------------           Adj R-squared =  0.6326
       Total |   7.6596854    31  .247086626           Root MSE      =  .30131


------------------------------------------------------------------------------
        quet |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0573642   .0077799     7.37   0.000     .0414755    .0732529
       _cons |   .3864517   .4176903     0.93   0.362    -.4665857    1.239489
------------------------------------------------------------------------------
```

invFtail(1, 30, 0.05) = 4.1708768, and F = 54.37 => we reject the Null hypothesis.

The regression line explains 64% of the total squared variation.
There is a definite linear component to the regression of quet on age.

4. SBP(Y) vs AGE(X)

```
. regress sbp age

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   45.18
       Model |  3861.63037     1  3861.63037           Prob > F      =  0.0000
    Residual |  2564.33838    30  85.4779458           R-squared     =  0.6009
-------------+------------------------------           Adj R-squared =  0.5876
       Total |  6425.96875    31  207.289315           Root MSE      =  9.2454

------------------------------------------------------------------------------
         sbp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |     1.6045   .2387159     6.72   0.000     1.116977    2.092023
       _cons |   59.09162   12.81626     4.61   0.000     32.91733    85.26592
------------------------------------------------------------------------------
```

invFtail(1, 30, 0.05) = 4.1708768, and F = 45.18 => we reject the Null hypothesis.
The regression line explains 60% of the total squared variation.
There is a definite linear component to the regression of sbp on age.

0 · flag

+ Comment

Erin Dillon · a month ago

I also got the same results as the responses above and will avoid re-posting the results. Taking this one step further, though, if we know from this homework that age predicts body size (body size increases as people get older) and that both body size and age predict blood pressure, how do we determine if these are both useful predictors? Perhaps body size is irrelevant, except that body size tends to increase as people age. If you maintain a low body size as you get older, will your blood pressure still increase?

If I put both variables in the model at the same time, I get:

```
. regress sbp quet age

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  2,    29) =   25.92
       Model |  4120.59224     2  2060.29612           Prob > F      =  0.0000
    Residual |  2305.37651    29  79.4957416           R-squared     =  0.6412
-------------+------------------------------           Adj R-squared =  0.6165
       Total |  6425.96875    31  207.289315           Root MSE      =   8.916

------------------------------------------------------------------------------
```

```
         sbp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        quet |   9.750732   5.402456     1.80   0.081    -1.298531        20.8
         age |   1.045157   .3860567     2.71   0.011     .2555828    1.834732
       _cons |   55.32344   12.53475     4.41   0.000       29.687    80.95987
------------------------------------------------------------------------------
```

Age remains a significant predictor of blood pressure, but body size falls below the p<.05 mark. So perhaps it's the case that age is the real predictor of blood pressure and both body size and blood pressure increase independently with age.

0 · flag

+ Comment

Anonymous · a month ago

why do we call this the Naive Model

0 · flag

+ Comment

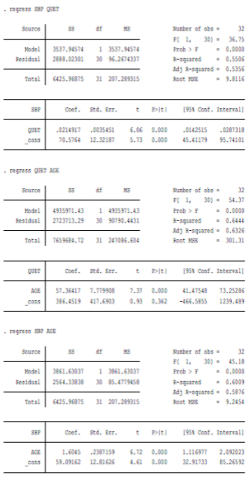
Anonymous · a month ago

What is the most important factor that determines how the significance to which the independent variable contributes to the model? Is it the p value or the value of the coefficient of independent variable

0 · flag

+ Comment

Ronald Ndesanjo · a month ago



```
. regress SBP QUET

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   36.75
       Model |  3537.94574     1  3537.94574           Prob > F      =  0.0000
    Residual |  2888.02301    30  96.2674337           R-squared     =  0.5506
-------------+------------------------------           Adj R-squared =  0.5356
       Total |  6425.96875    31  207.289315           Root MSE      =  9.8116

------------------------------------------------------------------------------
         SBP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        QUET |   .0214917   .0035451     6.06   0.000     .0142515    .0287318
       _cons |    70.5764   12.32187     5.73   0.000     45.41179    95.74101
------------------------------------------------------------------------------

. regress QUET AGE

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   54.37
       Model |  4935971.43     1  4935971.43           Prob > F      =  0.0000
    Residual |  2723713.29    30  90790.4431           R-squared     =  0.6444
-------------+------------------------------           Adj R-squared =  0.6326
       Total |  7659684.72    31  247086.604           Root MSE      =  301.31

------------------------------------------------------------------------------
        QUET |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         AGE |   57.36417   7.779908     7.37   0.000     41.47548    73.25286
       _cons |   386.4519   417.6903     0.93   0.362    -466.5855    1239.489
------------------------------------------------------------------------------

. regress SBP AGE

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   45.18
       Model |  3861.63037     1  3861.63037           Prob > F      =  0.0000
    Residual |  2564.33838    30  85.4779458           R-squared     =  0.6009
-------------+------------------------------           Adj R-squared =  0.5876
       Total |  6425.96875    31  207.289315           Root MSE      =  9.2454

------------------------------------------------------------------------------
         SBP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         AGE |     1.6045   .2387159     6.72   0.000     1.116977    2.092023
       _cons |   59.09162   12.81626     4.61   0.000     32.91733    85.26592
------------------------------------------------------------------------------
```

(a) The regression does not suggest a strong relationship between smoking and blood pressure (F=1.95). Therefore, we don't have evidence to reject the null hypothesis.

(b) The regression indicates a strong influence of body size on blood pressure (F=36.75). In other words, as one body grow so is chance for blood pressure. There is evidence to reject the null hypothesis therefore.

(c) The regression show that with increasing age so is the body size (F=54.37). We therefore have evidence to reject the null hypothesis.

(d) Age has got influence on bloods pressure (F=45.18). We have evidence to reject the null hypothesis.

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Sveta Kochergina · 21 days ago

1) SBP (Y) on SMK (X)
F(1, 30) = 1.95
that's why β1 is probably equal to zero. We fail to reject the null hypothesis. There is not sufficient evidence that smoking has a statistically significant effect on SBP

2) SBP (Y) on QUET (X)
F(1, 30) = 36.75
the F-ratio gets too large, so it's likely that β1 is not equal to zero. We reject the null hypothesis. There is sufficient evidence that body size has a statistically significant effect on SBP

3) QUET (Y) on AGE (X)
F(1, 30) = 54.37
the F-ratio gets too large, so it's likely that β1 is not equal to zero. We reject the null hypothesis. There is sufficient evidence that age has an impact on the body size

4) SBP (Y) on AGE (X)
F(1, 30) = 45.18
the F-ratio gets too large, so it's likely that β1 is not equal to zero. We reject the null hypothesis. There is sufficient evidence that age has an impact on SBP

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Michele Svanera · 16 days ago

Great explanation from Amos B Robinson! (I avoid to repeat answers)

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