EPPS 6313 : Recitation Session #8

Problem 1

Independent variable(X) is the number of cigarette the patients smoke a day, and dependent variable(Y) is Lung capacity.
Calculate variances for X and Y, and covariance.

Cigarettes(X)	Lung Capacity(Y)
0	45
5	42
10	33
15	31
20	29

Problem 2

From the table in the Problem 1, calculate the bivariate correlation between two variables.
And construct correct the null hypothesis, and test it.

EPPS 6316 : Recitation Session #8

Problem 1

```
reg Y X Z
      Source |       SS       df       MS              Number of obs =      10
-------------+------------------------------           F(  2,     7) =   26.30
       Model | 20.5428031      2  10.2714015           Prob > F      = 0.0006
    Residual | 2.73382203      7  .390546004           R-squared     = 0.8826
-------------+------------------------------           Adj R-squared = 0.8490
       Total | 23.2766251      9  2.58629168           Root MSE      = .62494

------------------------------------------------------------------------------
           Y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
           X |   1.023942   .6671332     1.53   0.169    -.5535776    2.601461
           Z |   .5038424   .6671332     0.76   0.475    -1.073677    2.081362
       _cons |   .3452928   .1976224     1.75   0.124    -.1220098    .8125955
------------------------------------------------------------------------------
. reg X Z
      Source |       SS       df       MS              Number of obs =      10
-------------+------------------------------           F(  1,     8) =   74.05
       Model |     8.1225      1      8.1225           Prob > F      = 0.0000
    Residual |      .8775      8    .1096875           R-squared     = 0.9025
-------------+------------------------------           Adj R-squared = 0.8903
       Total |          9      9           1           Root MSE      = .33119

------------------------------------------------------------------------------
           X |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
           Z |        .95    .110397     8.61   0.000     .695424    1.204576
       _cons |  -2.83e-17   .1047318    -0.00   1.000    -.241512     .241512
------------------------------------------------------------------------------
```

(1) From above the result, what do we need to worry about ? and why ?

(2) Compute VIF.

Problem 2

Choose all correct statements for multicorrinearity in the below list.

1. Perfect multicollinearity should only occur in error.

2. The OLS estimates(coefficients) remain unbiased.

3. High multicollinearity means little information to use making OLS estimates.

4. One of the solutions for multicollinearity is doing nothing if the interest variables are significant.