

## Exercise 2

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a)

corr =

1.0000	0.2105
0.2105	1.0000

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c)

coeff\_ols =

2.5549
1.1875
-0.9051
0.1036

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d)

- **standard formula of OLS**

coeff\_std1 =

0.0450	0.0179	0.0027	0.0212
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-**Bootstrap**

coeff\_std2 =

0.0390	0.0165	0.0027	0.0220
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## Exercise 3

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b)

**Optimal beta by steepest ascent**

beta\_new =

3.2026
1.1901
-0.9295
0.1084

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c)

distance =

2.7026
-0.0099
-0.0295
0.0084

**Comment:** Therefore, the parameter for intercept is far from the true parameter but the parameters for variables are close to the true parameters.

## Exercise 4

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a)

probit\_result =

3.2138	34.7963
1.1873	22.8785
-0.9303	-53.2032
0.1074	2.1935

**Comment:** Except the intercept, estimators of other three coefficients are close to real values and all of four estimators are significant, where the tstats are bigger than 2.

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b)

logit\_result =

5.7909	28.1256
2.1648	27.9111
-1.6835	-41.9751
0.1745	1.8574

**Comment:** Estimators of four coefficients are not very close to real values but all of four estimators are significant, where the tstats are bigger than 2.

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c)

linear\_result =

1.0e+03 *	
0.0005	1.8841
0.0013	3.3539
-0.0009	-2.1248
0.0001	4.3982

**Comment:** Estimators of four coefficients are far from real values and all of four estimators are not significant, where the tstats are far less than 2.

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## Exercise 5

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b) Calculating the standard deviation of parameters

- **Delta Method**

std\_dm\_probit =

0.0059

0.0133  
0.0022  
0.0060

std\_dm\_logit =

0.0065  
0.0147  
0.0017  
0.0071

#### - Bootstrap

me\_probit\_std =

0.4483 0.1657 0.1298 0.0150

me\_logit\_std =

0.4721 0.1765 0.1372 0.0142