HW2 Outcome

**Exercise 1**

Set.seed(20)

**Exercise 2**

**2.1 correlation**

> cor\_Y\_X1

[,1]

[1,] 0.2105922

**2.2 coefficients**

> coeff\_Y

[,1]

[1,] 5.08757224

[2,] 1.19210151

[3,] -0.90193912

[4,] -0.02407072

**2.3 bootstrapping**

B = 49

> se49

apply.sam1.beta..2..sd.

V1 0.074500510

V2 0.014721828

V3 0.003400321

V4 0.023429574

B = 499

> se499

apply.sam1.beta..2..sd.

V1 0.074500510

V2 0.014721828

V3 0.003400321

V4 0.023429574

**Exercise 3**

**Exercise 4**

**Probit/Logit/Linear**

> summary(probit\_y)

Call:

glm(formula = ydum ~ X - 1, family = binomial(link = "probit"),

data = data\_dum)

Deviance Residuals:

Min 1Q Median 3Q Max

-3.3306 -0.1048 0.0058 0.2318 3.8755

Coefficients:

Estimate Std. Error z value Pr(>|z|)

X1 5.98410 0.20048 29.849 <2e-16 \*\*\*

X2 1.27933 0.04506 28.389 <2e-16 \*\*\*

X3 -0.91520 0.01881 -48.657 <2e-16 \*\*\*

X4 -0.08984 0.04697 -1.913 0.0558 .

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

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 13862.9 on 10000 degrees of freedom

Residual deviance: 4228.1 on 9996 degrees of freedom

AIC: 4236.1

Number of Fisher Scoring iterations: 8

> summary(logit\_y)

Call:

glm(formula = ydum ~ X - 1, family = binomial(link = "logit"),

data = data\_dum)

Deviance Residuals:

Min 1Q Median 3Q Max

-3.0974 -0.1431 0.0341 0.2477 3.4287

Coefficients:

Estimate Std. Error z value Pr(>|z|)

X1 10.72478 0.37562 28.552 <2e-16 \*\*\*

X2 2.30126 0.08415 27.348 <2e-16 \*\*\*

X3 -1.64452 0.03751 -43.840 <2e-16 \*\*\*

X4 -0.14630 0.08443 -1.733 0.0831 .

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

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 13862.9 on 10000 degrees of freedom

Residual deviance: 4241.6 on 9996 degrees of freedom

AIC: 4249.6

Number of Fisher Scoring iterations: 7

> summary(linear\_y)

Call:

lm(formula = ydum ~ X - 1)

Residuals:

Min 1Q Median 3Q Max

-0.86113 -0.26770 0.05502 0.24997 1.92003

Coefficients:

Estimate Std. Error t value Pr(>|t|)

X1 1.7733976 0.0267346 66.334 <2e-16 \*\*\*

X2 0.1511188 0.0056841 26.586 <2e-16 \*\*\*

X3 -0.1038088 0.0009522 -109.020 <2e-16 \*\*\*

X4 -0.0155086 0.0071782 -2.161 0.0308 \*

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

Residual standard error: 0.33 on 9996 degrees of freedom

Multiple R-squared: 0.8052, Adjusted R-squared: 0.8051

F-statistic: 1.033e+04 on 4 and 9996 DF, p-value: < 2.2e-16

**Exercise 5**

**5.1 Marginal Effect**

> me\_logit

cdf\_logit \* coeff\_logit

X1 4.27830071

X2 0.91801158

X3 -0.65602796

X4 -0.05836338

**5.2 standard deviation**

> sd\_logit

[1] 0.0002910373 0.0011587475 0.0039568707 0.0000364046

**Bootstrap**

> me\_lb

V1 V2 V3 V4

0.0104695175 0.0022464850 0.0016053795 0.0001428222