Final Project Ver 1.0

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tinytex::install_tinytex()

```
crypto <- read.csv("/Users/user/Desktop/Yonsei/Junior/3-2/Introduction to Data Analysis and Regression/I

colnames(crypto) <- c('Bitcoin', 'Ethereum', 'Tether', 'BNB', 'USD.Coin', 'XRP', 'Binance.USD', 'Cardano

head(crypto)
```

```
##   Bitcoin Ethereum Tether     BNB USD.Coin     XRP Binance.USD Cardano Polygon
## 1  0.0133   0.0134  1e-04  0.0183   -1e-04  0.0136      -1e-04  0.0180  0.0332
## 2 -0.0324  -0.0208  0e+00 -0.0412    0e+00 -0.0423       1e-04 -0.0748  0.0330
## 3  0.0959   0.0771 -2e-04  0.0719    3e-04  0.0499       2e-04  0.0827  0.0558
## 4  0.0196   0.0329 -2e-04  0.0064    3e-04  0.0314       6e-04  0.0769  0.0618
## 5 -0.0007  -0.0063  4e-04 -0.0585   -6e-04 -0.0117      -8e-04 -0.0140 -0.0432
## 6 -0.0033  -0.0149  1e-04  0.0074    0e+00 -0.0226       0e+00 -0.0116 -0.0101
##   Dogecoin
## 1   0.0119
## 2  -0.0484
## 3   0.0686
## 4   0.0185
## 5  -0.0019
## 6  -0.0007
```

```
crypto_lm <- lm(Bitcoin~Ethereum+Tether+BNB+XRP+Cardano+Dogecoin, data=crypto)

summary(crypto_lm)
```

```
##
## Call:
## lm(formula = Bitcoin ~ Ethereum + Tether + BNB + XRP + Cardano +
##     Dogecoin, data = crypto)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.114933 -0.009908 -0.000813  0.008396  0.134159
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.531e-05  4.802e-04  -0.032  0.97457
## Ethereum     4.572e-01  1.736e-02  26.331  < 2e-16 ***
## Tether      -1.430e-01  2.148e-01  -0.666  0.50557
## BNB          1.003e-01  1.243e-02   8.068 1.28e-15 ***
## XRP          3.699e-02  1.159e-02   3.192  0.00144 **
## Cardano      7.462e-02  1.345e-02   5.546 3.36e-08 ***
```

```
## Dogecoin    -2.681e-05  3.302e-04  -0.081  0.93529
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02048 on 1820 degrees of freedom
## Multiple R-squared:  0.7053, Adjusted R-squared:  0.7043
## F-statistic:   726 on 6 and 1820 DF,  p-value: < 2.2e-16
```

```
anova(crypto_lm)
```

```
## Analysis of Variance Table
##
## Response: Bitcoin
##             Df  Sum Sq Mean Sq   F value    Pr(>F)
## Ethereum     1 1.76364 1.76364 4205.1139 < 2.2e-16 ***
## Tether       1 0.00030 0.00030    0.7096    0.3997
## BNB          1 0.04082 0.04082   97.3376 < 2.2e-16 ***
## XRP          1 0.00929 0.00929   22.1537 2.707e-06 ***
## Cardano      1 0.01290 0.01290   30.7480 3.368e-08 ***
## Dogecoin     1 0.00000 0.00000    0.0066    0.9353
## Residuals 1820 0.76332 0.00042
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
crypto_improve_lm <- lm(Bitcoin~Ethereum+BNB+XRP+Cardano, data=crypto)

summary(crypto_improve_lm)
```

```
##
## Call:
## lm(formula = Bitcoin ~ Ethereum + BNB + XRP + Cardano, data = crypto)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.114820 -0.009931 -0.000870  0.008444  0.134124
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.643e-05  4.799e-04  -0.034  0.97270
## Ethereum     4.570e-01  1.735e-02  26.338  < 2e-16 ***
## BNB          1.004e-01  1.241e-02   8.090 1.08e-15 ***
## XRP          3.721e-02  1.158e-02   3.213  0.00134 **
## Cardano      7.436e-02  1.344e-02   5.532 3.63e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02047 on 1822 degrees of freedom
## Multiple R-squared:  0.7052, Adjusted R-squared:  0.7046
## F-statistic:  1090 on 4 and 1822 DF,  p-value: < 2.2e-16
```

```
anova(crypto_improve_lm)
```

```
## Analysis of Variance Table
##
## Response: Bitcoin
##             Df  Sum Sq Mean Sq  F value    Pr(>F)
```

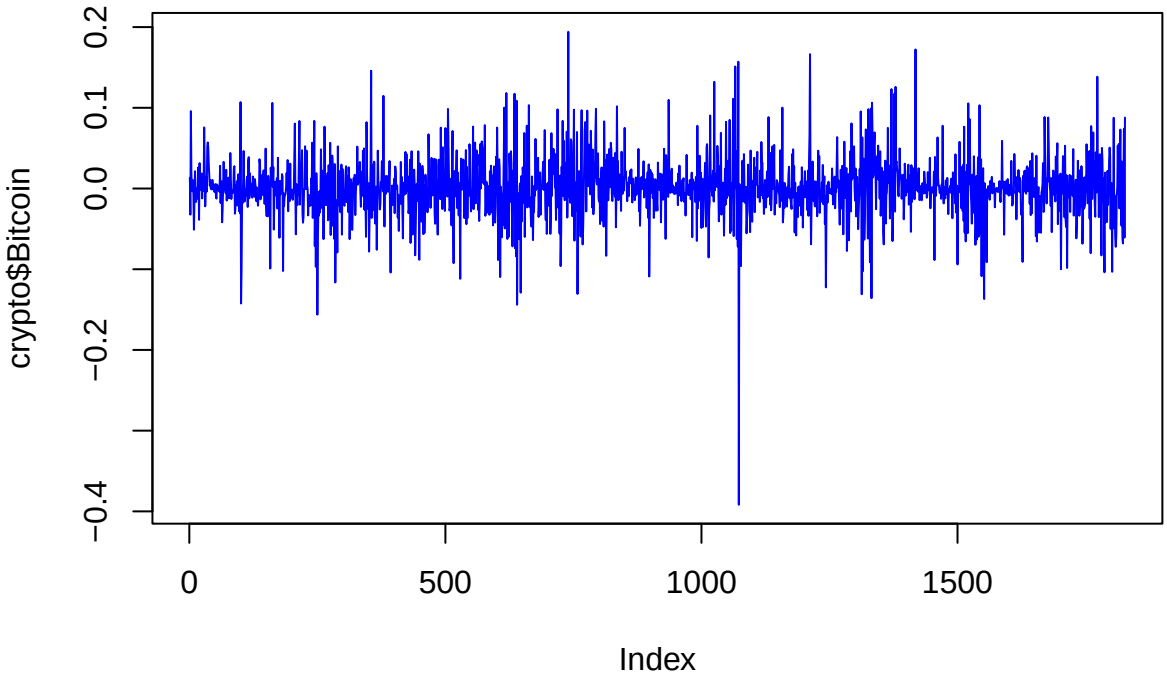
```
## Ethereum     1 1.76364 1.76364 4208.689 < 2.2e-16 ***
## BNB          1 0.04096 0.04096   97.743 < 2.2e-16 ***
## XRP          1 0.00934 0.00934   22.287 2.527e-06 ***
## Cardano      1 0.01282 0.01282   30.601 3.628e-08 ***
## Residuals 1822 0.76351 0.00042
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
anova(crypto_improve_lm, crypto_lm)
```

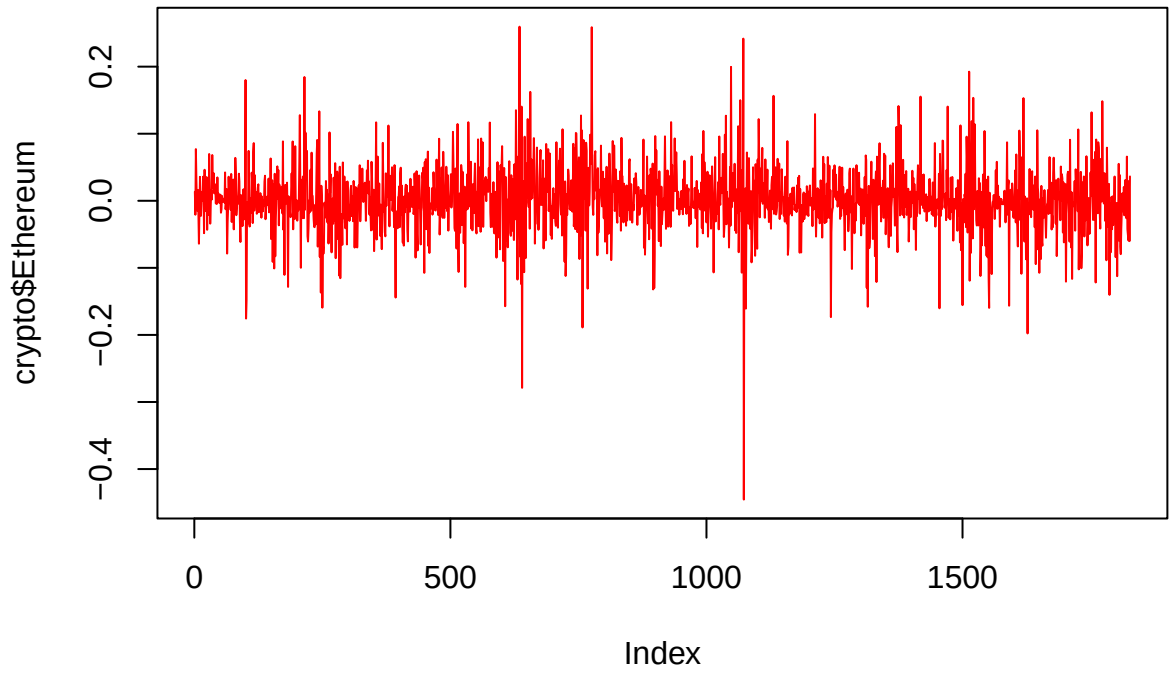
```
## Analysis of Variance Table
##
## Model 1: Bitcoin ~ Ethereum + BNB + XRP + Cardano
## Model 2: Bitcoin ~ Ethereum + Tether + BNB + XRP + Cardano + Dogecoin
##   Res.Df     RSS Df  Sum of Sq      F Pr(>F)
## 1   1822 0.76351
## 2   1820 0.76332  2 0.00018962 0.2261 0.7977
```

Thus, we can't reject the null, so that we had better use the reduced model.

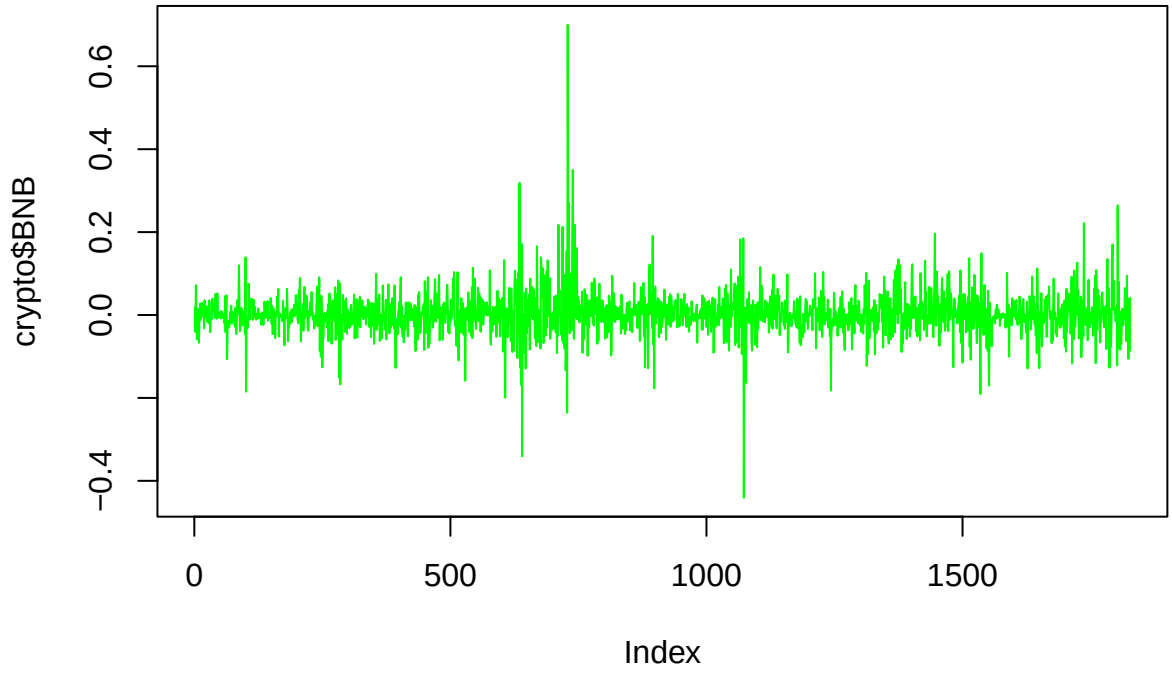
```
plot(crypto$Bitcoin, type='l', col='blue')
```



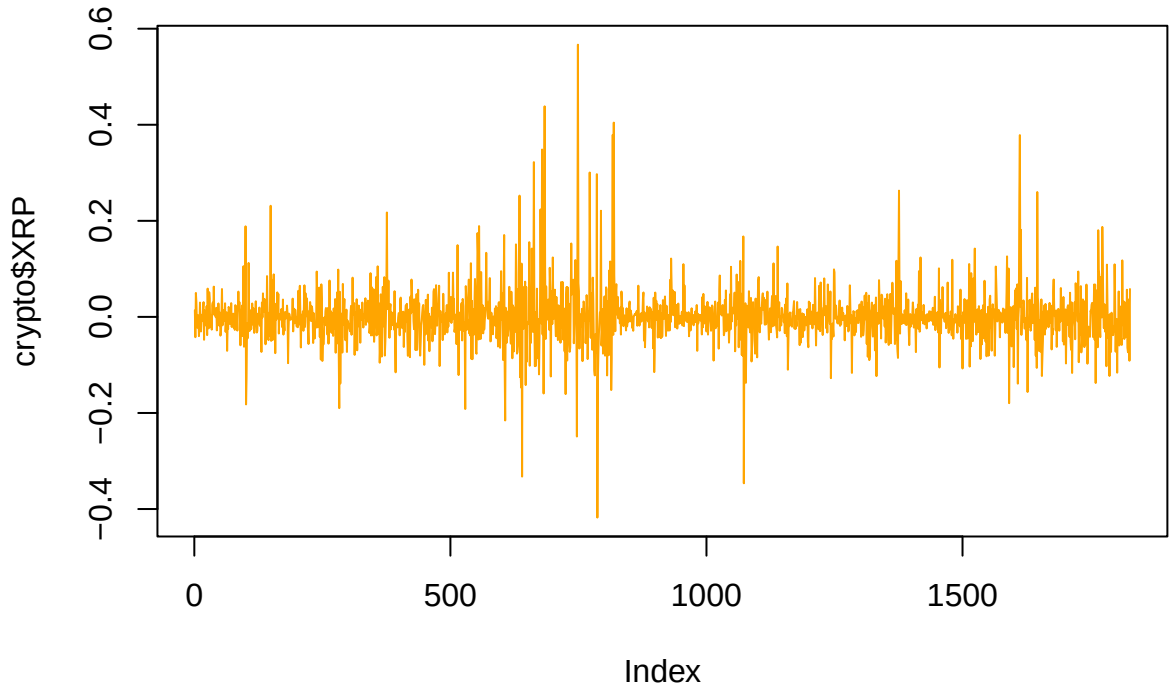

```
plot(crypto$Ethereum, type='l', col='red')
```




```
plot(crypto$BNB, type='l', col='green')
```




```
plot(crypto$XRP, type='l', col='orange')
```




```
plot(crypto$Cardano, type='l', col='purple')
```