Assignment 2

1.a.





1.b.

Based on the above two graphs I would say that Yesterday’s Russell was a better predictor because it follows Today’s Russell more closely.

1.c.

Average squared forecast error = Mean squared forecast error (MSFE) =

MSFE for Yesterday’s Russell = 132.961

MSFE for (0.5)(Yesterday’s Russell) = 5713.79

Therefore, this implies that Yesterday’s Russell is a better forecast for Today’s Russel.

2.



There seems to be a linear relationship between Today’s Russel and Yesterday’s Russel, and a strong, positive correlation between the two, as well.

2.b.

The Regression Equation is: Today = 0.544 + 0.99762 Yesterday

The prediction of today’s Russell is almost 1:1 with Yesterday’s Russell which is consistent to previous answers in 1.b. and 1.c. The R-square is also near 100% which indicates a good fit.

2.c.

The slope is not significantly different from 1 as it is very close by just 0.00238. Today’s value is 0.544 if an only if Yesterday is a zero.

2.d.



The Russell looks like a random walk since -1<alpha<1 and very close to 1.

2.e.

|  |  |
| --- | --- |
| Pearson correlation | 0.997 |
|  |  |

https://support.minitab.com/en-us/minitab/18/png/pearson_correlation_CO_mf.dita_ID86B4151C309B45F8AAD77E8D15056BDB_mtbreference_0.png Correlation: Today, Yesterday

3.a.



Descriptive Statistics: returns

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variable | N | N\* | Mean | SE Mean | StDev | Minimum | Q1 | Median | Q3 |
| returns | 1258 | 1 | 0.000509 | 0.000279 | 0.009911 | -0.038987 | -0.004901 | 0.001210 | 0.006751 |

Based on an ordinary t-test, the mean returns is not significantly different from zero.

3.b.





We assume Null Hypothesis (H0): Data is normally distributed. AD value = 3.607

Since the p value<0.005 (significance level) we reject the null hypothesis that the data is normally distributed. The normal distribution appears to be a good fit due to high AD.

3.c.



Today’s Russell seems to be easier to predict as it is a linear line rather than the return plot which does not give any prediction whatsoever.

3.d.

Regression Equation is: returns = 0.000520 - 0.0287 LagReturns

The equation tells us that today’s returns decrease with increase in yesterday’s returns. The intercept is very close to zero.