Solution to Homework 9

Question 1:

1.1

**DATA** logret;

INPUT Date $ Pfizer Intel Citigroup AmerExp Exxon GenMotor;

DATALINES;

1-Aug-00 -0.001438612 0.049981263 0.044275101 0.017410003 0.010224894 0.093294017

1-Sep-00 0.017489274 -0.255619266 -0.033536503 0.012656982 0.03798902 -0.032209239

2-Oct-00 -0.017046116 0.034546736 -0.011645582 -0.004897625 0.000330555 -0.019602167

1-Nov-00 0.012012934 -0.072550667 -0.022674793 -0.03827587 -0.00365002 -0.0948916

1-Dec-00 0.016278701 -0.102497868 0.010708311 0 -0.005252049 0.012461253

2-Jan-01 -0.008063083 0.090223122 0.03990062 -0.066129678 -0.014169243 0.022971579

1-Feb-01 -0.00042298 -0.11219423 -0.055096146 -0.030733152 -0.014046895 0.000824088

1-Mar-01 -0.040906294 -0.035702138 -0.038726816 -0.026380545 -0.000240008 -0.012105099

2-Apr-01 0.024190228 0.069994483 0.038511978 0.011868735 0.038897488 0.024082196

1-May-01 -0.002978787 -0.05826061 0.019333184 -0.002446047 0.002844256 0.020148775

1-Jun-01 -0.029781389 0.03463487 0.013258067 -0.03564197 -0.006813464 0.053440295

2-Jul-01 0.012504432 0.008168789 -0.022187219 0.017739418 -0.019481402 -0.005100405

1-Aug-01 -0.0306632 -0.027529477 -0.038475736 -0.044368019 -0.01460743 -0.061635162

4-Sep-01 0.01981548 -0.135934121 -0.053479798 -0.098043942 -0.008224146 -0.105946472

1-Oct-01 0.019063731 0.077211653 0.050835509 0.006689711 0.00061005 -0.016274333

1-Nov-01 0.015543895 0.126580684 0.02356606 0.048543672 -0.020726234 0.08521096

3-Dec-01 -0.036145791 -0.016421934 0.022871285 0.035242521 0.021578866 -0.009657415

2-Jan-02 0.019356687 0.046876533 -0.025940517 0.002871379 -0.002807817 0.022139216

1-Feb-02 -0.006050198 -0.088680731 -0.020151007 0.007237226 0.026948074 0.01967222

1-Mar-02 -0.013187975 0.027384065 0.039197815 0.050683167 0.025807264 0.057331233

1-Apr-02 -0.038640426 -0.026448085 -0.058277811 0.00137534 -0.037828005 0.025768635

1-May-02 -0.020012226 -0.014900615 0.000481346 0.015691714 -0.000118352 -0.010495544

3-Jun-02 0.00498962 -0.179572434 -0.046948457 -0.068454444 0.010640133 -0.065487824

1-Jul-02 -0.034159152 0.01226155 -0.062746165 -0.01186007 -0.0465282 -0.060041503

1-Aug-02 0.011452067 -0.051537916 0.022330581 0.009740522 -0.013050696 0.016998701

3-Sep-02 -0.056822917 -0.079127863 -0.043102044 -0.063162423 -0.045786933 -0.090010126

1-Oct-02 0.039382501 0.09536996 0.097624046 0.067951966 0.023357105 -0.068058029

1-Nov-02 -0.001620779 0.082000518 0.022127194 0.029514688 0.017231827 0.083238291

2-Dec-02 -0.013493147 -0.127500953 -0.043258124 -0.040869439 0.001739589 -0.032155007

2-Jan-03 -0.000914625 0.002562217 -0.008110182 0.002151752 -0.009860009 -0.006417575

3-Feb-03 -0.007697729 0.042681011 -0.012956568 -0.024428147 0.001227785 -0.025617995

3-Mar-03 0.01899439 -0.025156666 0.014203546 -0.004565156 0.011692992 -0.001942487

1-Apr-03 -0.005686915 0.053056729 0.056727624 0.057647618 0.003171011 0.030362391

1-May-03 0.005686915 0.054144721 0.021322255 0.041490099 0.01767084 -0.00280191

2-Jun-03 0.041784483 -0.000213046 0.018444872 0.001579917 -0.005981586 0.008214181

1-Jul-03 -0.010109859 0.077829522 0.023189447 0.024870758 -0.003990877 0.016906014

1-Aug-03 -0.045266311 0.06043443 -0.01419843 0.008620388 0.028166116 0.046380496

2-Sep-03 0.006546894 -0.016587184 0.021075597 0.000112293 -0.01291723 -0.001791893

1-Oct-03 0.017184425 0.078321576 0.020888904 0.018572284 -0.00024981 0.018169063

3-Nov-03 0.028255616 0.007861351 -0.003462108 -0.01144524 -0.001501884 0.006155458

1-Dec-03 0.022153888 -0.019719492 0.013782077 0.024270976 0.054151115 0.096343714

2-Jan-04 0.015748075 -0.021237664 0.011862818 0.03132587 -0.00221919 -0.031390331

2-Feb-04 0.002115176 -0.018679024 0.006780909 0.01301928 0.01712318 -0.009458693

1-Mar-04 -0.01928823 -0.030753805 0.012267738 -0.012145545 -0.006030469 -0.007941261

1-Apr-04 0.008607804 -0.024068646 -0.027843588 -0.024949111 0.009863444 0.001620126

3-May-04 -0.003063819 0.045791862 -0.015263851 0.015239967 0.00995531 -0.014176433

1-Jun-04 -0.013135825 -0.01478726 0.000692103 0.006594513 0.011450989 0.011337234

1-Jul-04 -0.030491723 -0.053760665 -0.019188415 -0.009580051 0.018083807 -0.03339934

2-Aug-04 0.011876253 -0.058250748 0.023904782 -0.002001822 0.000773627 -0.013614662

1-Sep-04 -0.02833205 -0.02581149 -0.023595125 0.012265109 0.020475586 0.012073829

1-Oct-04 -0.024200939 0.045251691 0.006452318 0.01438828 0.007945468 -0.042109935

1-Nov-04 -0.015356644 0.003157084 0.003644451 0.021085951 0.019898881 0.006031965

1-Dec-04 -0.01408469 0.019040089 0.032148678 0.005093112 8.64354E-05 0.016341604

3-Jan-05 -0.046516472 -0.017862074 0.00770161 -0.022982941 0.002842759 -0.036824626

1-Feb-05 0.039975516 0.030472706 -0.008076244 0.006507102 0.090927282 -0.00798521

1-Mar-05 -0.000338104 -0.013929818 -0.02606549 -0.02185412 -0.026194026 -0.083992068

1-Apr-05 0.014633051 0.00525287 0.023245386 0.011111802 -0.019130346 -0.042013994

2-May-05 0.014630589 0.060803225 0.001318328 0.009356124 -0.004194614 0.079608491

1-Jun-05 -0.005088825 -0.015344193 -0.008162243 -0.004091884 0.009725145 0.03275369

1-Jul-05 -0.017295755 0.018252426 -0.022110024 0.014246467 0.009586797 0.034619924

1-Aug-05 -0.014040733 -0.02213234 0.002713407 0.001894712 0.010547196 -0.02599387

1-Sep-05 -0.008682706 -0.01834345 0.016994806 0.016950229 0.025608232 -0.047977476

3-Oct-05 -0.060303366 -0.020818266 0.002497608 -0.003389887 -0.053831314 -0.048092196

1-Nov-05 0.002411637 0.058709923 0.03829912 0.024183203 0.031923551 -0.070676054

;

**PROC** **REG** data = logret;

MODEL Pfizer = Exxon;

**RUN**;

| **Parameter Estimates** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **DF** | **Parameter Estimate** | **Standard Error** | **t Value** | **Pr > |t|** |
| **Intercept** | **1** | -0.00533 | 0.00276 | -1.93 | 0.0579 |
| **Exxon** | **1** | 0.35465 | 0.11973 | 2.96 | 0.0043 |

Estimate for Intercept is -0.00533 and for Exxon is 0.35465

1.2

**PROC** **CORR** data = logret;

VAR Pfizer Exxon;

**RUN**;

| **Pearson Correlation Coefficients, N = 64  Prob > |r| under H0: Rho=0** | | |
| --- | --- | --- |
|  | **Pfizer** | **Exxon** |
| **Pfizer** | |  | | --- | | 1.00000 | |  | | |  | | --- | | 0.35210 | | 0.0043 | |
| **Exxon** | |  | | --- | | 0.35210 | | 0.0043 | | |  | | --- | | 1.00000 | |  | |

The correlation of Pfizer and Exxon is 0.35210 and the p value is 0.0043 less than 0.05, we reject the null hypothesis, we reject that the correlation of Pfizer and Exxon is zero.

2.

**DATA** q2;

INPUT X Y Z@@;

DATALINES;

1 3 15 7 13 7 8 12 5 3 4 14 4 7 10

;

2.1

**PROC** **CORR** data = q2;

VAR X Y Z;

**RUN**;

| **Pearson Correlation Coefficients, N = 5  Prob > |r| under H0: Rho=0** | | | |
| --- | --- | --- | --- |
|  | **X** | **Y** | **Z** |
| **X** | |  | | --- | | 1.00000 | |  | | |  | | --- | | 0.96509 | | 0.0078 | | |  | | --- | | -0.97525 | | 0.0047 | |
| **Y** | |  | | --- | | 0.96509 | | 0.0078 | | |  | | --- | | 1.00000 | |  | | |  | | --- | | -0.96317 | | 0.0084 | |
| **Z** | |  | | --- | | -0.97525 | | 0.0047 | | |  | | --- | | -0.96317 | | 0.0084 | | |  | | --- | | 1.00000 | |  | |

The correlation between X and Y is 0.96509, p value is 0.0078 less than 0.05, reject the null hypothesis, it is significant.

The correlation between X and Z is -0.97525, p value is 0.0047 less than 0.05, reject the null hypothesis, it is significant.

The correlation between Y and Z is -0.96317, p value is 0.0084 less than 0.05, reject the null hypothesis, it is significant.

**PROC** **CORR** data = q2;

VAR X Y;

PARTIAL Z;

**RUN**;

| **Pearson Partial Correlation Coefficients, N = 5  Prob > |r| under H0: Partial Rho=0** | | |
| --- | --- | --- |
|  | **X** | **Y** |
| **X** | |  | | --- | | 1.00000 | |  | | |  | | --- | | 0.43318 | | 0.5668 | |
| **Y** | |  | | --- | | 0.43318 | | 0.5668 | | |  | | --- | | 1.00000 | |  | |

The partial correlation is 0.43318, p value is 0.5668 greater than 0.05, cannot reject the null hypothesis, it is not significantly different with 0.

2.2

**PROC** **REG** data = q2;

MODEL Y = X;

**RUN**;

| **Parameter Estimates** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **DF** | **Parameter Estimate** | **Standard Error** | **t Value** | **Pr > |t|** |
| **Intercept** | **1** | 0.78916 | 1.25920 | 0.63 | 0.5753 |
| **X** | **1** | 1.52410 | 0.23882 | 6.38 | 0.0078 |

The regression line is Y = 0.78916 + 1.52410 X

Slope is 1.52410 and intercept is 0.78916

The p value for intercept is 0.5753 greater than 0.05, cannot reject the null hypothesis, it is not significant different from 0.

The p value for slope is 0.0078 less than 0.05, reject the null hypothesis, it is significant different from 0.

2.3

**DATA** q2log;

SET q2;

LX = LOG(X);

LY = LOG(Y);

LZ = LOG(Z);

**RUN**;

**PROC** **CORR** data = q2log;

VAR LX LY LZ;

**RUN**;

| **Pearson Correlation Coefficients, N = 5  Prob > |r| under H0: Rho=0** | | | |
| --- | --- | --- | --- |
|  | **LX** | **LY** | **LZ** |
| **LX** | |  | | --- | | 1.00000 | |  | | |  | | --- | | 0.94096 | | 0.0171 | | |  | | --- | | -0.88224 | | 0.0476 | |
| **LY** | |  | | --- | | 0.94096 | | 0.0171 | | |  | | --- | | 1.00000 | |  | | |  | | --- | | -0.94277 | | 0.0163 | |
| **LZ** | |  | | --- | | -0.88224 | | 0.0476 | | |  | | --- | | -0.94277 | | 0.0163 | | |  | | --- | | 1.00000 | |  | |