Baruch College, STA-CIS 3920, Exercise#2 Anil Poonai 37

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**NOTICE: THE CLOSING PRICE IS ACTUALLY THE ADJUSTED CLOSING PRICE WHEN IT IS MENTIONED**

**Exercise 2.1**

My company is A. O. Smith Corporation with stock ticker AOS and they currently manufacture water heaters and boilers but they were the worlds largest bomb maker at the end of WWI. They currently also deal in water treatment products in Asian countries.

**Exercise 2.2**

a.

A close up of a necklace

Description automatically generated

A picture containing bird, rain

Description automatically generatedb.

c.

The Daily Percentage Return(PR) is stable compared to the Daily Closing Price(CP) as the PR scatters around zero with some noticeable parts scattering farther out, while the CP is more of a random pattern as its increasing overtime but can’t see it revolving around any number meaning it doesn’t have a probability distribution like the PR does.

d.

No, it does not have a stable population standard deviation as it may appear to be stable through certain ranges of time it still has its fair share of areas that are more volatile than the rest. This means that is it always changing even in the less volatile areas of time.

**Exercise 2.3**

a.

A close up of a logo

Description automatically generatedb.A picture containing boat

Description automatically generated

The data is not stable even with more bins as it just looks like random lines with no order and no recognizable distribution.

**Exercise 2.4**

a.

A screenshot of a cell phone

Description automatically generated

b.

A picture containing boat

Description automatically generatedc.

Yes, the increase in bins make it look more like a normal distribution than before. The bell-curve is more solid than it was before.

**Exercise 2.5**

a.

A picture containing nature, rain, bird, flying

Description automatically generated

b.

This argues for using the normal distribution as a model for stock returns just like the previous time series graphs of returns as they all are centered around zero and are relatively stable in variation.

c.

A close up of a organ

Description automatically generatedd.

The normal distribution is a good model as the probability distribution of the model seems to match the histograms mostly, but they also don’t account for the differences as the histogram curves aren’t as smooth as the normal model curves and aren’t going to be exact ever.

**Exercise 2.6**

a.

A picture containing computer

Description automatically generated

A screenshot of a cell phone

Description automatically generated

The daily range be on the smaller end of the spectrum and to have a really high probability of occurring compared to the other ranges.

b.

A picture containing bird, water, flying, rain

Description automatically generated

A close up of a organ

Description automatically generatedThe log function makes the range seem more like a normal distribution with a mean of -1. This is most likely due to the non-linear nature of the data.

**APPENDIX**

**NOTICE: A LOT OF THE CODE ISN’T GOING TO BE HERE DUE TO HOW LONG IT ENDED UP BEING AND ME LIMITING MY RAM FOR THE PROGRAM. I DID NOT REALIZE UNTIL THE END BUT I CAN WORK OUT THE CODE AGAIN IF NEED BE.**

1982 11/14/2013 27.245001 27.360001 26.975000 27.260000 24.127300 1620400 0.36815899

1983 11/15/2013 27.295000 27.385000 27.139999 27.195000 24.069775 963400 -0.23842287

1984 11/18/2013 27.174999 27.235001 26.745001 26.860001 23.773275 1524000 -1.23183536

1985 11/19/2013 26.815001 27.020000 26.639999 26.730000 23.658211 1113000 -0.48400567

1986 11/20/2013 26.795000 27.075001 26.754999 26.900000 23.808674 1149600 0.63598638

1987 11/21/2013 27.025000 27.205000 26.860001 27.190001 24.065344 1025400 1.07805248

1988 11/22/2013 27.145000 27.334999 27.105000 27.320000 24.180412 789000 0.47814816

1989 11/25/2013 27.325001 27.334999 27.160000 27.264999 24.131731 739400 -0.20132411

1990 11/26/2013 27.215000 27.590000 27.205000 27.440001 24.286619 834800 0.64184372

1991 11/27/2013 27.504999 27.504999 27.014999 27.254999 24.122879 1244800 -0.67419841

1992 11/29/2013 27.270000 27.485001 27.070000 27.075001 23.963562 393000 -0.66043941

1993 12/2/2013 27.084999 27.205000 26.799999 26.920000 23.826384 852400 -0.57244411

1994 12/3/2013 26.770000 26.945000 26.440001 26.615000 23.556429 885000 -1.13300869

1995 12/4/2013 26.555000 26.620001 26.129999 26.434999 23.397114 1029400 -0.67631219

1996 12/5/2013 26.385000 26.469999 26.155001 26.260000 23.242229 1130400 -0.66198335

1997 12/6/2013 26.430000 26.830000 26.430000 26.535000 23.485619 1054600 1.04718872

1998 12/9/2013 26.754999 27.049999 26.375000 26.485001 23.441368 1180000 -0.18841743

1999 12/10/2013 26.415001 26.770000 26.375000 26.440001 23.401543 658800 -0.16989196

2000 12/11/2013 26.434999 26.459999 25.830000 26.035000 23.043077 928000 -1.53180498

2001 12/12/2013 25.995001 26.334999 25.915001 26.219999 23.206820 852800 0.71059520

2002 12/13/2013 26.325001 26.420000 26.049999 26.250000 23.233372 884800 0.11441464

2003 12/16/2013 26.325001 26.690001 26.295000 26.590000 23.534298 896600 1.29523170

2004 12/17/2013 26.584999 26.645000 26.280001 26.570000 23.516596 1177800 -0.07521788

2005 12/18/2013 26.584999 26.990000 26.309999 26.915001 23.821959 1675000 1.29850000

2006 12/19/2013 26.780001 26.934999 26.270000 26.360001 23.330729 1943800 -2.06208902

2007 12/20/2013 26.355000 27.004999 26.355000 26.995001 23.892761 2312200 2.40897745

2008 12/23/2013 27.190001 27.215000 26.900000 27.000000 23.897188 2178800 0.01852862

2009 12/24/2013 26.990000 27.240000 26.990000 27.139999 24.021097 399000 0.51850871

2010 12/26/2013 27.200001 27.330000 27.075001 27.080000 23.967993 533200 -0.22107234

2011 12/27/2013 27.110001 27.195000 26.975000 27.010000 23.906034 634200 -0.25850725

2012 12/30/2013 27.014999 27.174999 26.965000 27.040001 23.932587 756000 0.11107238

2013 12/31/2013 27.040001 27.250000 26.950001 26.969999 23.870632 841400 -0.25887298

2014 1/2/2014 26.965000 26.990000 26.535000 26.660000 23.596262 1297000 -1.14940400

2015 1/3/2014 26.719999 26.870001 26.570000 26.655001 23.591829 828200 -0.01878687

2016 1/6/2014 26.700001 26.860001 26.615000 26.635000 23.574133 1045600 -0.07500902

2017 1/7/2014 26.754999 26.770000 26.325001 26.375000 23.344011 1572200 -0.97616315

2018 1/8/2014 26.280001 26.405001 25.969999 26.075001 23.078487 2465800 -1.13743949

2019 1/9/2014 26.205000 26.389999 25.959999 26.240000 23.224525 1787600 0.63278845

2020 1/10/2014 26.330000 26.400000 26.240000 26.264999 23.246649 1130600 0.09526137

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2024 1/16/2014 26.184999 26.315001 25.940001 26.065001 23.069633 1274600 -0.78035535

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2026 1/21/2014 26.215000 26.299999 25.610001 25.844999 22.874916 2153000 -0.88208122

2027 1/22/2014 25.950001 26.120001 25.870001 26.110001 23.109463 1473400 1.02534584

2028 1/23/2014 26.010000 26.190001 25.885000 26.105000 23.105038 1563600 -0.01914800

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2033 1/30/2014 24.090000 24.129999 23.754999 23.905001 21.157862 1590000 0.06281042

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2037 2/5/2014 22.754999 23.100000 22.605000 23.075001 20.557636 1911800 1.22833238

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2092 4/25/2014 23.709999 23.830000 23.495001 23.580000 21.007544 2052200 -1.06984212

2093 4/28/2014 23.549999 23.695000 23.014999 23.370001 20.953741 1488000 -0.25611276

2094 4/29/2014 23.430000 23.610001 23.275000 23.395000 20.976162 1356400 0.10700237

2095 4/30/2014 23.434999 23.485001 23.230000 23.379999 20.962706 1221800 -0.06414901

2096 5/1/2014 23.430000 23.770000 23.275000 23.605000 21.164446 1304800 0.96237575

2097 5/2/2014 23.584999 24.084999 23.575001 23.889999 21.419979 936200 1.20736919

2098 5/5/2014 23.725000 23.825001 23.555000 23.695000 21.245142 858600 -0.81623329

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2103 5/12/2014 23.709999 24.350000 23.674999 24.305000 21.792074 1162000 3.14023854

2104 5/13/2014 24.305000 24.370001 23.870001 23.875000 21.406534 920400 -1.76917534

2105 5/14/2014 23.855000 24.025000 23.625000 23.635000 21.191343 1217200 -1.00525849

2106 5/15/2014 23.639999 23.709999 23.184999 23.639999 21.195831 1110600 0.02117846

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2117 6/2/2014 24.700001 24.905001 24.590000 24.889999 22.316595 1753200 0.81007745

2118 6/3/2014 24.790001 24.879999 24.424999 24.459999 21.931051 1329800 -1.72761122

2119 6/4/2014 24.375000 24.645000 24.360001 24.610001 22.065540 899400 0.61323554

2120 6/5/2014 24.530001 24.745001 24.530001 24.725000 22.168646 1281800 0.46727159

2121 6/6/2014 24.830000 25.000000 24.709999 24.995001 22.410736 720000 1.09203783

2122 6/9/2014 25.000000 25.584999 24.895000 25.535000 22.894901 880200 2.16041544

2123 6/10/2014 25.500000 25.580000 25.389999 25.455000 22.823175 633200 -0.31328373

2124 6/11/2014 25.330000 25.475000 25.195000 25.395000 22.769377 1018000 -0.23571655

2125 6/12/2014 25.315001 25.480000 24.985001 25.059999 22.469011 918200 -1.31916653

2126 6/13/2014 25.084999 25.174999 24.889999 24.965000 22.383839 576400 -0.37906430

2127 6/16/2014 24.969999 24.995001 24.500000 24.820000 22.253826 751200 -0.58083423

2128 6/17/2014 24.745001 25.090000 24.600000 24.895000 22.321074 773200 0.30218624

2129 6/18/2014 24.795000 24.924999 24.504999 24.865000 22.294174 832000 -0.12051391

2130 6/19/2014 24.860001 24.924999 24.735001 24.895000 22.321074 519400 0.12065933

2131 6/20/2014 24.910000 24.924999 24.670000 24.785000 22.222443 1508600 -0.44187390

2132 6/23/2014 24.860001 25.075001 24.670000 24.725000 22.168646 635400 -0.24208409

2133 6/24/2014 24.745001 24.850000 24.615000 24.635000 22.087955 968200 -0.36398705

2134 6/25/2014 24.555000 24.799999 24.555000 24.750000 22.191065 689800 0.46681551

2135 6/26/2014 24.745001 24.745001 24.385000 24.469999 21.940016 775800 -1.13130668

2136 6/27/2014 24.389999 24.690001 24.330000 24.690001 22.137266 1034400 0.89904219

2137 6/30/2014 24.695000 24.790001 24.434999 24.790001 22.226934 1617800 0.40505454

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2139 7/2/2014 24.889999 24.969999 24.480000 24.545000 22.007259 644200 -1.34646349

2140 7/3/2014 24.555000 24.820000 24.504999 24.764999 22.204514 551600 0.89631789

2141 7/7/2014 24.730000 24.730000 24.080000 24.129999 21.635166 732000 -2.56410926

2142 7/8/2014 24.260000 24.264999 23.889999 24.195000 21.693449 1335400 0.26939012

2143 7/9/2014 24.209999 24.445000 24.100000 24.150000 21.653101 510000 -0.18599163

2144 7/10/2014 23.650000 24.075001 23.650000 23.805000 21.343771 877000 -1.42857136

2145 7/11/2014 23.750000 23.840000 23.549999 23.780001 21.321354 876400 -0.10502830

2146 7/14/2014 23.990000 24.240000 23.900000 24.010000 21.527571 1007000 0.96718529

2147 7/15/2014 24.014999 24.059999 23.620001 23.820000 21.357218 938200 -0.79132476

2148 7/16/2014 23.950001 24.004999 23.719999 23.834999 21.370670 1194000 0.06298573

2149 7/17/2014 23.709999 23.725000 23.275000 23.295000 20.886501 1389000 -2.26557707

2150 7/18/2014 23.340000 23.650000 23.230000 23.455000 21.029961 2015600 0.68685511

2151 7/21/2014 23.334999 23.665001 23.184999 23.490000 21.061335 1659200 0.14918715

2152 7/22/2014 24.165001 25.315001 23.950001 25.250000 22.639370 2477600 7.49256873

2153 7/23/2014 25.235001 25.455000 24.870001 24.950001 22.370386 1389600 -1.18812494

2154 7/24/2014 24.975000 25.135000 24.709999 24.735001 22.177620 1093400 -0.86170172

2155 7/25/2014 24.590000 24.895000 24.510000 24.770000 22.208996 764400 0.14147596

2156 7/28/2014 24.690001 24.690001 24.195000 24.280001 21.769661 1019400 -1.97818488

2157 7/29/2014 24.174999 24.325001 23.709999 23.709999 21.390738 1465200 -1.74060129

2158 7/30/2014 23.795000 23.830000 23.520000 23.709999 21.390738 859000 0.00000000

2159 7/31/2014 23.490000 23.625000 23.180000 23.350000 21.065958 1552800 -1.51832069

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2162 8/5/2014 23.610001 24.000000 23.610001 23.875000 21.539602 1289400 0.54746164

2163 8/6/2014 23.690001 23.785000 23.600000 23.660000 21.345636 799200 -0.90050875

2164 8/7/2014 23.705000 23.844999 23.375000 23.434999 21.142641 984200 -0.95099064

2165 8/8/2014 23.495001 24.240000 23.495001 24.200001 21.832809 797200 3.26434148

2166 8/11/2014 24.320000 24.334999 24.004999 24.065001 21.711018 651200 -0.55783477

2167 8/12/2014 23.990000 24.145000 23.680000 23.785000 21.458406 594800 -1.16351983

2168 8/13/2014 23.795000 23.990000 23.680000 23.895000 21.557644 572200 0.46246678

2169 8/14/2014 23.950001 24.180000 23.674999 24.174999 21.810255 707800 1.17179317

2170 8/15/2014 24.254999 24.254999 23.850000 24.100000 21.742596 856000 -0.31021646

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2172 8/19/2014 24.615000 24.820000 24.575001 24.705000 22.288416 791400 0.83675572

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3621 5/21/2020 42.270000 42.939999 42.250000 42.680000 42.680000 835300 0.51813708

3622 5/22/2020 42.810001 42.810001 41.900002 42.220001 42.220001 1103500 -1.07778585

3623 5/26/2020 43.240002 45.209999 43.130001 44.830002 44.830002 1639200 6.18190653

3624 5/27/2020 45.430000 47.310001 45.369999 47.209999 47.209999 2183300 5.30893797

3625 5/28/2020 47.439999 47.740002 46.369999 46.590000 46.590000 2323200 -1.31327899

3626 5/29/2020 46.490002 47.570000 46.009998 47.500000 47.500000 2662000 1.95320884

3627 6/1/2020 47.509998 47.639999 46.959999 47.320000 47.320000 1067100 -0.37894737

3628 6/2/2020 47.470001 47.880001 47.200001 47.880001 47.880001 1017800 1.18343407

3629 6/3/2020 48.259998 49.990002 48.169998 49.849998 49.849998 1224800 4.11444645

3630 6/4/2020 49.270000 50.599998 49.259998 50.570000 50.570000 1705100 1.44433707

3631 6/5/2020 51.580002 52.400002 51.459999 52.000000 52.000000 2078500 2.82776350

3632 6/8/2020 51.869999 52.700001 50.740002 50.880001 50.880001 1618600 -2.15384423

3633 6/9/2020 50.110001 50.520000 49.119999 49.270000 49.270000 1709600 -3.16431008

3634 6/10/2020 49.230000 49.299999 48.360001 48.389999 48.389999 1302600 -1.78607875

3635 6/11/2020 47.450001 47.689999 46.660000 46.820000 46.820000 1167200 -3.24447000

3636 6/12/2020 48.029999 48.160000 45.880001 46.950001 46.950001 1163500 0.27766126

3637 6/15/2020 45.930000 47.910000 45.759998 47.650002 47.650002 940400 1.49094992

3638 6/16/2020 48.820000 49.480000 47.340000 47.880001 47.880001 1079000 0.48268414

3639 6/17/2020 48.220001 48.340000 47.599998 47.689999 47.689999 825900 -0.39682957

3640 6/18/2020 47.450001 48.240002 47.189999 47.930000 47.930000 1102500 0.50325226

3641 6/19/2020 48.619999 48.799999 46.810001 47.290001 47.290001 1458100 -1.33527853

3642 6/22/2020 47.119999 47.580002 46.349998 47.189999 47.189999 667400 -0.21146542

3643 6/23/2020 47.650002 47.860001 47.279999 47.470001 47.470001 967000 0.59335030

3644 6/24/2020 47.070000 47.189999 45.110001 45.110001 45.110001 1369900 -4.97156088

3645 6/25/2020 44.939999 44.980000 43.880001 44.740002 44.740002 1552200 -0.82021501

3646 6/26/2020 44.459999 45.200001 44.110001 44.450001 44.450001 2639300 -0.64819175

3647 6/29/2020 44.889999 46.680000 44.860001 46.439999 46.439999 1031000 4.47693578

3648 6/30/2020 46.240002 47.439999 46.139999 47.119999 47.119999 1091600 1.46425498

3649 7/1/2020 47.360001 47.360001 46.169998 46.299999 46.299999 938200 -1.74023773

3650 7/2/2020 46.990002 47.770000 46.740002 47.320000 47.320000 1072800 2.20302597

3651 7/6/2020 48.040001 48.599998 47.779999 48.040001 48.040001 779400 1.52155748

3652 7/7/2020 47.570000 48.299999 47.540001 47.900002 47.900002 962700 -0.29142173

3653 7/8/2020 48.049999 48.220001 47.509998 47.840000 47.840000 874200 -0.12526513

3654 7/9/2020 47.660000 48.070000 47.220001 47.570000 47.570000 1013400 -0.56438127

3655 7/10/2020 47.799999 48.709999 47.689999 48.270000 48.270000 866200 1.47151566

3656 7/13/2020 48.520000 49.020000 48.340000 48.470001 48.470001 1043000 0.41433810

3657 7/14/2020 48.389999 49.939999 48.099998 49.930000 49.930000 729800 3.01217035

> head(dataset)

Date Open High Low Close Adj.Close Volume LGFet

1 1/3/2006 5.870000 6.146667 5.863333 6.141667 2.620321 1702800 NA

2 1/4/2006 6.141667 6.230000 6.120000 6.175000 2.634542 1293600 0.5427198

3 1/5/2006 6.258333 6.280000 6.085000 6.116667 2.609655 1296400 -0.9446424

4 1/6/2006 6.283333 6.375000 6.266667 6.326667 2.699250 2917200 3.4332124

5 1/9/2006 6.308333 6.601666 6.308333 6.541667 2.790979 2010400 3.3983143

6 1/10/2006 6.541667 6.780000 6.490000 6.698333 2.857820 2080800 2.3948944

> dataset=read.csv("AOS.csv")

> head(dataset)

Date Open High Low Close Adj.Close Volume LGFet

1 1/3/2006 5.870000 6.146667 5.863333 6.141667 2.620321 1702800 NA

2 1/4/2006 6.141667 6.230000 6.120000 6.175000 2.634542 1293600 0.5427198

3 1/5/2006 6.258333 6.280000 6.085000 6.116667 2.609655 1296400 -0.9446424

4 1/6/2006 6.283333 6.375000 6.266667 6.326667 2.699250 2917200 3.4332124

5 1/9/2006 6.308333 6.601666 6.308333 6.541667 2.790979 2010400 3.3983143

6 1/10/2006 6.541667 6.780000 6.490000 6.698333 2.857820 2080800 2.3948944

> dataset=dataset[-1,]

> head(dataset)

Date Open High Low Close Adj.Close Volume LGFet

2 1/4/2006 6.141667 6.230000 6.120000 6.175000 2.634542 1293600 0.5427198

3 1/5/2006 6.258333 6.280000 6.085000 6.116667 2.609655 1296400 -0.9446424

4 1/6/2006 6.283333 6.375000 6.266667 6.326667 2.699250 2917200 3.4332124

5 1/9/2006 6.308333 6.601666 6.308333 6.541667 2.790979 2010400 3.3983143

6 1/10/2006 6.541667 6.780000 6.490000 6.698333 2.857820 2080800 2.3948944

7 1/11/2006 6.680000 6.708333 6.565000 6.598333 2.815156 1474800 -1.4928862

> plot(dataset$Close)

> plot(dataset$Close,xlab="Days",ylab="Closing Price",main=AOS Daily Closing Price)

Error: unexpected symbol in "plot(dataset$Close,xlab="Days",ylab="Closing Price",main=AOS Daily"

> plot(dataset$Close,xlab="Days",ylab="Closing Price",main="AOS Daily Closing Price")

> plot(dataset$LGFet,xlab="Days",ylab="Percentage Return",main="AOS Daily Percentage return")

> plot(dataset$LGFet,xlab="Days",ylab="Percentage Return",main="AOS Daily Percentage return")

> hist(dataset$Adj.Close)

> hist(dataset$Adj.Close,xlab=Closing Price,ylab=Days)

Error: unexpected symbol in "hist(dataset$Adj.Close,xlab=Closing Price"

> hist(dataset$Adj.Close,xlab="Closing Price",ylab="Days")

> hist(dataset$Adj.Close,xlab="Closing Price",ylab="Days",main="AOS Daily Closing Price")

> plot(dataset$Adj.Close,xlab="Days",ylab="Closing Price",main="AOS Daily Closing Price")

> hist(dataset$Adj.Close,xlab="Closing Price",ylab="Days",main="AOS Daily Closing Price",breaks=200)

> hist(dataset$LGFet,xlab="Percentage Return",ylab="Days",main="AOS Daily Percentage Return")

> hist(dataset$LGFet,xlab="Percentage Return",ylab="Days",main="AOS Daily Percentage Return",breaks=100)

> hist(dataset$Adj.Close,xlab="Closing Price",ylab="Days",main="AOS Daily Closing Price",breaks=100)

> random=rnorm(2500)

> random

[1] -7.757510e-01 1.617525e+00 -3.331744e-02 -8.986626e-01 -5.549256e-01 -4.417969e-01 -1.177347e+00 2.677690e-01 -3.070492e-01 -3.865087e-01 -1.267828e+00 -6.290404e-01 -3.345309e-01 8.457705e-01 -6.998829e-01

[16] -2.142376e+00 6.637173e-01 -2.671647e+00 -1.245022e+00 -2.949559e-01 -5.370835e-01 -1.136753e+00 1.507922e+00 1.978554e-01 -2.998123e-02 -3.068448e-01 9.595895e-01 -6.911232e-01 5.767550e-01 -2.208253e+00

[31] 1.552992e-01 -3.215407e-01 -8.444844e-01 3.363171e-01 -2.925374e-01 -4.715444e-01 -6.900552e-01 -8.107465e-01 -1.196858e+00 2.428226e+00 -1.403207e+00 5.906094e-01 -3.572368e-02 -1.145162e+00 1.536015e+00

[46] 5.123254e-01 -6.457112e-01 7.142471e-01 3.895503e-01 -6.266867e-01 -1.496491e+00 -5.332678e-01 1.026924e+00 -1.070935e+00 -5.295652e-01 6.708261e-01 -8.370318e-02 -6.441218e-01 6.352708e-01 5.929890e-01

[61] -1.107253e+00 2.688834e-01 1.797177e+00 6.006872e-01 4.898909e-01 6.911024e-01 -1.166741e+00 6.166364e-02 -9.109928e-01 -4.101426e-01 -1.548995e+00 -1.391069e+00 -1.689901e-01 -8.858921e-01 -2.306139e-01

[76] 2.154097e+00 1.417737e+00 -1.207661e-01 -9.879547e-02 1.478802e+00 2.648053e-01 6.774151e-01 -1.319071e+00 -4.507407e-01 2.045527e-01 -2.321612e-02 -1.276914e-02 5.327022e-01 -3.447272e-01 -2.313345e-01

[91] -9.460098e-01 -1.561818e+00 5.027484e-01 -2.094586e+00 -1.347734e+00 1.029613e-01 -6.666338e-01 -1.057422e-02 -6.603732e-01 1.074629e-01 4.494622e-01 -3.430816e-01 -1.748699e+00 -9.078822e-01 -1.712607e-01

[106] 6.508754e-01 -2.548702e-01 1.134840e+00 -8.318483e-01 1.893712e+00 1.308962e+00 -1.503784e+00 -2.444242e+00 -3.251794e-01 1.943892e-02 2.986235e-01 7.644639e-01 1.361639e+00 -3.392567e-01 -1.943417e+00

[121] -1.590287e-01 -6.205055e-01 3.993028e-01 -5.658573e-01 -1.012730e+00 -6.176074e-01 1.484826e+00 -1.137260e+00 2.142054e-01 7.273180e-02 1.140042e+00 -2.240438e-01 1.183839e+00 5.133648e-01 -3.036640e-01

[136] 1.606101e-01 -2.088615e-01 5.491743e-02 1.277297e+00 5.423021e-01 -5.259355e-01 3.072461e-01 3.183345e-01 5.171713e-01 7.700071e-01 8.194605e-01 -1.519141e+00 1.625955e+00 1.424520e+00 1.836688e+00

[151] 2.682796e-01 4.529408e-01 -6.874721e-01 -1.070230e+00 -1.895425e-01 -1.774682e+00 4.633626e-01 3.444564e-01 7.413901e-01 5.329610e-01 2.338251e+00 3.658026e-01 -5.412497e-01 7.673690e-01 1.854382e+00

[166] -4.191191e-02 -5.709193e-01 -7.093419e-01 -2.595739e+00 4.859722e-01 4.829113e-01 -2.917917e-01 -9.996456e-01 6.080616e-01 3.749711e-01 3.833709e-01 -8.118898e-01 -7.972682e-01 -2.716077e-02 -2.186713e-01

[181] 1.908453e+00 -6.500173e-01 -1.342120e+00 7.208101e-01 4.630539e-01 8.816686e-03 2.291554e+00 -7.560531e-01 -6.565907e-01 6.302325e-01 7.332175e-01 1.022495e+00 2.111442e+00 -1.512009e-02 -1.398142e+00

[196] 5.679260e-01 1.266979e+00 -3.432115e-01 1.889640e-01 -4.761090e-01 -2.356003e-01 -1.129394e-01 -1.505559e+00 -3.778171e-01 -9.193146e-01 1.020376e+00 8.833945e-01 1.990110e-01 2.242329e-01 -2.096650e+00

[211] -7.928355e-01 1.887250e+00 -8.914319e-01 -2.067248e-01 -1.033999e+00 1.008376e+00 4.516257e-01 -1.089744e+00 1.383222e+00 5.971862e-01 1.812348e+00 -6.422008e-01 -2.147679e-01 -4.087117e-02 -9.535234e-01

[226] -1.846512e+00 -1.669927e+00 -1.202025e+00 -4.377579e-01 -7.627500e-01 -9.125613e-01 -1.937725e+00 -3.671917e-01 3.451664e-01 5.375473e-01 1.834643e+00 -1.413395e+00 -9.095560e-01 -7.489623e-01 -8.893812e-01

[241] 3.686057e-01 4.196217e-01 4.621673e-01 -2.318813e+00 -9.946039e-01 1.956262e+00 -1.409383e-01 2.828691e-01 -4.725686e-01 3.328597e-01 3.552585e-01 9.921122e-01 -7.362028e-01 -7.427159e-01 3.885326e-01

[256] -1.266925e+00 -1.746829e-01 -2.797038e-01 -9.638843e-01 -2.654113e+00 -9.567160e-02 -9.230642e-01 -7.683305e-01 -1.063689e+00 -6.924644e-01 -3.804056e-01 -9.272111e-01 -1.143330e+00 -4.176898e-01 1.148711e+00

[271] -5.297115e-01 1.514851e+00 -3.653494e-01 -5.726516e-01 8.868738e-01 1.061651e+00 4.932401e-01 1.704678e+00 8.194371e-01 -1.001321e+00 1.190182e+00 3.514414e-01 -5.906357e-01 6.644389e-01 -6.409114e-01

[286] 4.770208e-01 -7.005307e-01 9.640946e-01 1.865500e+00 -4.207670e-01 -6.332753e-01 4.724747e-01 -4.076366e-01 -2.463524e-01 1.684718e+00 -8.014554e-01 -8.288392e-01 -2.158501e+00 3.422822e-01 7.719987e-01

[301] 4.636126e-01 -2.620763e-01 -1.622554e+00 1.320657e+00 5.578790e-02 8.028575e-02 3.974198e-01 6.968261e-01 -1.258441e-02 -5.551509e-01 -1.771831e+00 -9.249968e-01 -8.091098e-01 3.751448e-01 2.132278e+00

[316] -3.975514e-01 -1.565306e+00 -2.614203e-01 -6.015898e-01 5.334638e-01 -1.519372e+00 -2.540089e-01 -2.793167e-02 -2.374240e-01 -2.047584e+00 -4.600836e-01 7.106469e-01 5.862552e-01 -5.445219e-02 -1.448449e+00

[331] -9.509214e-01 1.234210e-01 -8.590151e-02 -9.301198e-02 7.995288e-01 2.394434e+00 -3.004400e-01 -4.011230e-01 -1.156246e-01 -3.782521e-01 8.793948e-01 1.166257e+00 -1.225196e+00 -8.572404e-03 -3.585917e-01

[346] 2.540577e+00 -5.394539e-01 -8.907620e-01 -8.043427e-01 -4.716363e-01 7.815390e-01 -1.803245e-02 1.031431e+00 3.139221e-01 6.381372e-01 -1.110661e-01 -5.609453e-01 -8.180480e-01 -2.698346e-01 -1.153034e-01

[361] 1.733961e+00 -2.266208e-01 -6.687532e-01 5.938220e-01 3.469554e-01 7.069265e-01 4.457919e-01 4.809523e-01 -1.640296e-01 3.540568e-01 7.438809e-01 1.133894e+00 -7.949619e-01 -8.804700e-01 -1.663777e+00

[376] 9.788360e-01 3.533994e+00 -3.646955e-01 -8.142009e-01 1.256544e+00 -5.325033e-01 -5.208531e-01 1.337035e+00 -1.269451e+00 -3.766121e-01 -3.827781e-02 3.350098e-01 -1.089350e+00 -2.002104e+00 -8.969378e-01

[391] -2.972110e-01 1.134227e-02 1.776008e-01 -5.456319e-02 9.787920e-01 1.898310e+00 -6.482549e-01 1.113443e+00 -1.427743e+00 1.684467e-01 3.027847e-01 7.724128e-01 -6.675989e-01 1.388134e+00 -1.784067e-02

[406] 3.706494e-01 1.082618e+00 7.327050e-01 -5.152181e-01 -3.797795e-01 -9.587712e-02 8.216423e-01 1.937900e+00 -2.852149e-02 -1.235379e+00 -9.610874e-01 -2.821351e-02 -1.211879e-01 1.420674e+00 -2.005968e-02

[421] -3.422836e-01 8.001671e-01 1.107290e-01 -2.322052e-01 1.951522e-01 -9.338073e-01 -4.528005e-01 1.831507e+00 9.814823e-01 1.331144e+00 -1.167525e+00 1.393096e+00 6.437186e-01 1.182102e+00 1.803025e+00

[436] 7.562761e-01 2.367843e-01 -4.566942e-01 -7.925854e-01 5.303135e-01 4.906625e-01 9.364930e-01 2.166802e-01 1.185893e+00 3.057798e-02 -5.836348e-01 -4.844055e-01 3.545755e-02 -7.185404e-01 -1.374415e+00

[451] -2.624260e-01 -1.531785e+00 2.630389e-01 -2.081960e+00 5.677934e-01 7.842061e-01 -1.950084e+00 9.949481e-01 -1.140380e+00 -6.683474e-01 9.442470e-02 4.717604e-01 8.510621e-01 -1.314823e+00 1.280917e+00

[466] 2.849577e-01 -2.082972e+00 1.669563e+00 4.167352e-01 -1.578977e+00 -8.322438e-01 -5.120770e-01 -1.134796e+00 1.141213e+00 4.352414e-01 3.362882e-01 2.793905e+00 -4.058013e-01 -2.407648e-02 -7.040028e-01

[481] 1.108481e+00 -8.818118e-01 -4.372727e-01 5.441455e-01 -2.513623e+00 3.373896e-01 1.183855e+00 5.625593e-01 -1.738868e+00 5.346866e-01 1.406959e+00 -8.029212e-03 3.578334e-01 9.104725e-01 -8.197379e-01

[496] 5.765567e-01 6.251243e-01 -1.239576e+00 -8.578439e-01 3.169441e-01 2.534257e+00 -1.888539e+00 1.650281e+00 -7.584942e-01 -3.061839e-01 -1.239283e+00 8.908051e-01 -4.727437e-01 2.334816e+00 -4.808275e-01

[511] 9.482908e-02 3.853428e-01 -3.389158e-01 -3.183655e-01 -7.716998e-01 -5.904419e-01 -3.161808e-01 -1.094506e+00 6.362328e-01 7.875079e-01 8.722768e-01 2.731326e-01 -2.728438e-01 -1.278929e+00 2.926875e-01

[526] -8.027982e-01 6.068399e-01 8.447168e-03 -9.148471e-01 1.306932e+00 -7.532385e-01 -1.229618e+00 -9.879010e-01 -2.112155e-01 -1.304611e-01 7.921631e-01 9.400081e-01 1.392608e+00 -1.273389e+00 -5.484595e-01

[541] -1.113713e+00 -3.256754e-01 1.847235e-02 9.569107e-01 -5.642156e-04 -1.070883e+00 7.783845e-01 7.127544e-01 -1.665872e-01 2.539282e-01 -1.930896e+00 1.746811e+00 2.972474e+00 -3.337266e-01 -1.093856e-01

[556] -1.042853e+00 -3.767721e-01 3.887919e-01 3.411974e-01 -1.658404e+00 -1.408004e-01 -1.093555e+00 -5.870831e-01 1.209468e-01 -2.999344e-01 1.387476e+00 3.525312e-02 -3.610385e-01 5.757990e-01 1.337863e-01

[571] 3.166843e-01 -3.032337e-01 -4.345126e-01 7.312067e-01 1.192171e+00 -7.426391e-01 1.564738e+00 -7.422195e-01 4.588716e-02 9.368025e-01 -2.228519e+00 -9.852318e-03 -2.237364e+00 3.559927e-01 3.429824e-01

[586] 8.113594e-01 -1.138894e+00 2.501672e-01 -4.458792e-01 1.586125e+00 -2.066053e+00 -1.440984e-01 2.157656e-01 -4.817607e-02 7.694904e-01 -1.001410e+00 9.412085e-01 -4.729510e-01 -7.726356e-01 2.824630e-01

[601] -7.057889e-01 -3.354936e-01 -1.139601e+00 3.424735e-02 -4.720202e-02 8.816392e-01 8.710493e-01 1.789718e+00 1.423458e-01 -9.763948e-02 1.623625e+00 3.411592e-01 8.442549e-01 1.981772e+00 2.291828e-01

[616] 5.097349e-01 -8.106866e-01 5.777622e-01 -6.569496e-01 -1.504001e+00 -3.273219e-01 -1.092071e+00 3.264532e-01 -2.388025e-01 1.133298e+00 -2.478086e-01 1.913464e+00 1.112193e+00 9.562735e-01 4.113564e-01

[631] 8.421581e-01 1.588575e+00 8.266019e-01 -7.695684e-01 -5.591792e-01 -1.329672e+00 -9.213385e-01 -2.433660e-01 3.369747e-01 -3.190760e-01 -9.397730e-01 1.323841e+00 1.054421e+00 -3.908191e-01 -5.251425e-02

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[1576] 1.041750e+00 -1.092055e+00 -2.996115e-01 -2.050271e-01 1.161870e+00 -2.997085e-01 -1.510863e+00 -8.658642e-01 -4.298684e-01 -2.944672e-01 1.103771e-01 -1.212832e+00 -2.204533e-01 1.238985e-01 -1.568467e-01

[1591] -1.342730e+00 -1.290838e+00 -5.680158e-01 -4.697761e-01 -6.789188e-01 -3.994388e-03 1.786253e+00 -3.578172e-01 2.349715e-01 8.770504e-01 -2.316516e-01 -9.607027e-01 6.755227e-02 -7.418519e-01 2.491796e-01

[1606] -4.095848e-01 -6.049216e-01 -3.797543e-01 4.045738e-01 -6.258853e-01 -7.451962e-01 1.208529e-02 -4.530388e-01 -1.403688e-01 -3.142868e-01 8.719388e-01 6.565562e-01 8.570655e-01 6.669872e-01 -1.970372e-01

[1621] 1.237254e-03 1.862374e+00 5.836808e-01 1.682164e+00 1.268044e-01 1.332093e+00 7.608128e-01 -2.929965e-02 -1.698225e-01 -9.800632e-01 1.130599e+00 1.076802e+00 -5.466614e-01 -1.372055e+00 4.222999e-01

[1636] -1.533274e+00 5.205079e-01 -3.964184e-01 6.669955e-01 -1.016822e+00 -3.788038e-01 5.883287e-01 -7.767219e-01 -3.617109e-01 1.138818e+00 -4.726046e-01 4.904674e-01 -6.005836e-01 -1.138635e-01 7.134698e-01

[1651] 5.126748e-01 1.520632e-01 -1.008004e-01 5.039793e-01 -5.779490e-01 2.196122e-01 -6.382194e-01 5.348998e-01 -4.570156e-01 1.349054e+00 1.057521e+00 -1.461648e+00 7.580797e-01 1.038888e-01 -4.135810e-01

[1666] -1.663032e+00 -9.037854e-01 2.499376e-01 1.882688e-01 -3.096056e-01 -1.182028e+00 -1.609473e+00 3.968007e-02 3.280293e-01 1.640386e+00 -4.823045e-01 -2.001089e+00 1.554884e+00 -1.367967e-01 4.242128e-02

[1681] -8.663325e-01 5.179013e-01 -6.469093e-01 1.007776e+00 1.626761e-01 1.946696e-01 -3.019067e-01 -7.890944e-01 -2.571590e-01 -8.865615e-01 -9.886824e-01 -1.230777e+00 -7.153888e-01 -1.936062e+00 -3.479351e-01

[1696] 1.562745e+00 1.258566e+00 -1.377204e+00 8.314718e-01 3.458849e-01 4.461727e-01 1.272701e+00 2.172477e+00 1.033803e+00 -1.527647e+00 7.343852e-01 8.891348e-01 -1.293276e+00 1.690212e+00 1.343298e-01

[1711] 7.893566e-01 7.696907e-01 -1.865826e+00 2.189569e+00 1.523604e+00 -2.453297e-01 -1.011788e+00 4.386724e-01 -1.232553e+00 2.647160e-01 -1.005450e+00 -1.150069e+00 -1.789935e-02 7.606156e-01 2.773119e+00

[1726] -1.724368e+00 3.273334e+00 4.150940e-01 -2.239341e+00 1.006304e-01 2.091829e-01 4.269668e-01 1.428370e-02 -1.461422e+00 1.184446e+00 -1.392968e+00 -5.442714e-01 3.175862e-01 4.212648e-01 -9.599642e-02

[1741] 1.278003e+00 4.447222e-02 2.376981e+00 -1.477763e+00 5.546990e-01 7.410040e-01 -8.402880e-01 -5.530690e-02 -5.277222e-01 7.674143e-01 1.629188e-01 8.538887e-02 -1.584722e+00 -6.432032e-01 7.732295e-01

[1756] -8.891897e-02 -2.456707e-01 -1.167176e-01 -4.054937e-01 1.485936e+00 9.606121e-01 -3.074598e-01 3.004624e-01 -9.089421e-01 -9.627530e-02 -1.824695e+00 1.449091e+00 -4.072731e-01 -1.077969e-01 -9.120985e-01

[1771] -1.531951e-01 -1.522345e+00 -1.181590e+00 3.752502e-01 4.929771e-01 6.405468e-02 2.958230e-01 1.359618e+00 -2.703674e-01 -3.400451e-01 1.118108e-01 4.576969e-01 -8.786593e-01 -3.568234e-03 2.991435e-01

[1786] -1.538811e-01 1.844280e-01 -1.933807e+00 8.478247e-01 -1.081453e+00 9.181409e-01 -1.152218e+00 -7.153165e-02 -2.409107e+00 -5.417698e-01 5.968818e-01 -3.546180e-01 -2.003603e+00 -2.553536e-01 -5.942235e-01

[1801] -1.109769e+00 9.965754e-01 7.947443e-01 7.548584e-02 -5.598312e-01 8.342097e-01 -3.073622e-01 -2.551384e-01 3.931566e-01 3.302109e-01 -1.822106e+00 -6.466193e-01 3.176575e-01 -5.680223e-02 -3.554400e-01

[1816] 5.270885e-01 6.480410e-01 8.778633e-02 1.572582e+00 -1.579476e+00 5.219774e-01 9.848704e-01 1.375497e+00 -2.201626e-01 -4.100067e-01 -2.240655e-01 -1.800859e+00 1.166443e-01 -2.024851e-01 3.592232e-01

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[1861] 1.294260e+00 7.565872e-01 -5.678658e-01 -1.032322e-01 -8.519141e-02 8.398281e-01 -2.704169e-01 -5.620593e-01 -3.323072e-01 2.267331e-01 -1.781451e+00 3.961524e-01 -1.145706e+00 -8.241178e-01 -1.073161e+00

[1876] 1.184478e-01 7.520490e-01 2.055101e-01 2.978579e-01 -1.102267e+00 -1.153502e+00 9.914887e-01 1.133417e-01 -2.041266e-01 -1.370947e-01 7.744865e-01 2.549055e-01 3.301603e-02 -1.639139e-01 -1.443963e-01

[1891] 2.609290e+00 2.138062e+00 -1.653879e+00 -2.064051e+00 4.589507e-01 7.154479e-02 4.754308e-01 3.619819e-01 5.867704e-01 9.341770e-01 -1.677405e+00 -1.426741e+00 1.090284e+00 -6.640770e-01 9.822527e-01

[1906] -5.535785e-01 2.431527e-01 -7.445525e-01 -5.318892e-01 -5.330288e-01 -1.749473e+00 -1.014394e+00 -9.434737e-01 2.318098e-01 -1.788575e+00 -4.375232e-01 -1.190334e+00 3.735675e-01 1.984216e+00 -3.184383e+00

[1921] -9.536280e-01 2.592078e-01 -1.923196e+00 -1.928914e-01 1.051675e+00 5.972985e-01 1.413280e+00 4.765104e-01 1.269116e+00 1.584386e-01 -1.236451e+00 -1.447982e-01 -7.785267e-01 1.058691e+00 1.253891e+00

[1936] 1.314353e+00 7.585338e-03 5.723849e-01 4.099068e-01 -1.634438e+00 -5.363488e-01 -4.899540e-01 2.472457e-01 2.258538e+00 -2.141135e+00 5.551485e-01 -2.363470e-01 1.446674e+00 8.775840e-01 1.094306e+00

[1951] 1.100221e-01 -5.437762e-01 -6.682983e-01 -4.244502e-01 -5.389627e-01 -3.247330e-01 2.114991e+00 1.021142e+00 1.673676e+00 2.915741e-01 1.841023e-01 -3.295489e-01 3.952939e-01 1.022405e+00 2.314739e+00

[1966] 2.288594e+00 7.332395e-01 2.142833e-01 1.746336e-01 -9.365667e-01 -1.629994e-01 1.780537e+00 6.155256e-02 -3.842558e-01 -3.177352e-02 -6.604376e-01 1.611921e-01 7.415743e-01 5.574795e-01 -7.156074e-01

[1981] 8.093258e-01 8.083674e-01 1.034718e+00 -1.543671e-01 -8.093278e-02 -1.875270e+00 -2.267802e+00 -8.852432e-01 4.916184e-01 -1.265532e+00 -6.163714e-01 1.102474e+00 1.547441e-01 -9.499574e-01 9.795153e-01

[1996] -2.651354e-01 7.286410e-01 1.296898e+00 2.327375e+00 -1.712619e+00 3.568414e-01 -2.889519e-01 1.970161e-01 -5.112973e-01 -8.681174e-01 1.710732e+00 3.216359e-01 -7.426343e-01 -1.935581e-01 -2.989085e-01

[2011] -1.003890e-02 -5.481568e-01 1.109421e+00 1.343353e+00 1.255152e+00 -1.291831e+00 1.926335e+00 1.419505e+00 6.527630e-01 -1.357459e+00 1.005211e+00 -6.720038e-01 5.413954e-01 1.996625e+00 -1.871141e+00

[2026] 3.897695e-01 3.544282e-01 -1.919643e+00 -4.809630e-01 -9.680561e-01 1.208858e-01 1.703109e-01 -6.808729e-02 -9.230885e-03 -2.812413e+00 2.497412e+00 -7.463113e-01 -1.674095e+00 -3.071000e-01 1.310587e-01

[2041] 1.408363e+00 -1.387650e+00 -2.192807e-01 -2.935615e-01 6.801548e-01 -8.119343e-02 2.243064e-01 -1.228453e+00 -1.569376e+00 8.493264e-01 3.631364e-01 -3.873313e-01 -1.201531e+00 1.241825e+00 -1.758683e-01

[2056] -1.031690e+00 -2.555379e-01 -1.487771e+00 2.625577e+00 -1.140119e+00 9.665064e-01 1.274131e+00 -1.610332e+00 1.203383e+00 2.626819e-01 6.722733e-01 1.437760e+00 -2.464815e-01 -3.291738e-01 -2.751869e-01

[2071] 2.555563e-01 8.194582e-01 -9.464481e-01 8.650005e-02 1.390604e-01 4.040989e-01 -9.316145e-01 8.164373e-01 -1.473719e+00 -1.455066e-01 -1.780655e-01 1.822093e+00 -9.192981e-01 1.673609e+00 -8.670034e-02

[2086] 6.376745e-01 1.185649e-01 -3.711051e-01 3.211225e-01 -9.435844e-01 -2.997578e-01 -7.610885e-01 8.814449e-01 1.009282e+00 -1.962745e-01 -3.461225e-01 1.142395e+00 -4.817997e-01 1.338194e+00 -8.677472e-01

[2101] -1.230870e+00 1.684298e+00 -9.506618e-01 3.139639e-01 1.474307e+00 9.916914e-01 -1.568740e-01 4.107751e-01 7.630728e-01 9.554562e-01 -5.109644e-01 8.906787e-01 6.193001e-01 4.821697e-01 1.568438e+00

[2116] -9.627892e-04 -1.119137e+00 -4.550232e-01 1.581954e+00 6.003774e-03 -7.840794e-01 4.000996e-02 -4.451957e-01 -1.477047e+00 3.444733e-01 5.027264e-01 1.338556e+00 -1.116266e+00 9.238154e-01 1.052172e+00

[2131] -4.727258e-01 2.986283e-01 4.022480e-01 -9.804974e-02 -6.531866e-01 3.043294e-01 3.826087e-01 -4.509777e-01 1.878785e+00 -8.886416e-01 -7.951664e-01 2.152142e+00 2.807635e+00 -5.068072e-01 6.735183e-02

[2146] 9.819970e-01 1.900213e+00 -1.478436e+00 -7.297277e-01 2.272372e+00 1.471080e+00 -1.407809e+00 -5.486334e-01 4.753659e-01 -1.957592e-01 5.352015e-01 3.674321e-01 4.027151e-01 9.309281e-01 4.043219e-01

[2161] -7.425289e-01 -1.493626e+00 -6.498062e-01 -3.080991e-01 2.715401e-01 5.054465e-02 7.445291e-01 -3.547599e-02 9.417768e-01 -8.162590e-02 8.165836e-01 3.752353e-02 3.599024e-01 -8.595376e-01 -1.004424e+00

[2176] -1.896361e-01 -1.324433e+00 -3.152714e-02 7.329760e-01 4.294898e-02 1.554411e+00 1.399060e+00 -1.240268e+00 1.137444e+00 -4.586795e-01 2.153117e-01 -1.928692e+00 9.133219e-01 1.372964e+00 -6.392061e-01

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[2206] -9.511996e-01 -8.597780e-01 6.174947e-01 -1.840825e+00 4.887554e-01 -1.743067e-01 1.293782e+00 -2.592868e+00 4.386932e-01 7.361221e-01 1.498611e-01 -2.350458e-01 1.338706e+00 1.295331e-01 -6.550112e-01

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[2236] -3.839207e-01 7.932699e-01 -5.117900e-02 -1.042661e+00 -5.973341e-01 1.589991e+00 1.083162e+00 -2.262438e-02 1.667919e+00 9.536796e-01 -3.940298e-01 1.122276e+00 4.765971e-01 1.048708e+00 9.358401e-02

[2251] -3.750475e-01 2.327772e-01 -4.442622e-02 -1.635690e+00 -1.053435e+00 2.461204e-01 1.145226e-01 -7.859182e-02 -1.293006e+00 -8.510175e-01 2.767344e-01 -1.373005e+00 1.576755e+00 -3.073910e-01 -2.681852e+00

[2266] 4.886119e-01 5.802863e-01 1.161452e+00 -1.873988e+00 1.498878e+00 1.012714e+00 -8.786434e-02 6.214409e-02 1.340651e+00 9.495395e-01 -1.259337e+00 1.569323e+00 -6.483754e-01 6.441811e-02 -8.362461e-01

[2281] -3.829037e-01 -1.176643e+00 -5.851735e-01 3.346691e-01 9.532619e-01 7.096746e-02 -2.595682e-01 -9.870747e-02 -8.980614e-01 -3.872342e-01 -3.362547e-01 1.231665e+00 -3.781550e-01 -4.234139e-01 -1.258211e+00

[2296] -6.482448e-01 -1.532238e+00 1.321220e+00 6.748372e-01 5.616317e-01 -1.129895e+00 9.060125e-01 -1.022324e+00 -1.761618e+00 -1.431013e-02 -1.240023e-01 7.739536e-01 1.398222e+00 1.749920e+00 1.403684e-01

[2311] -3.056914e-01 1.536350e-01 1.891746e+00 8.465157e-01 -3.562260e-01 -8.531006e-01 1.131221e+00 9.525297e-01 2.204464e-02 -7.047070e-02 2.017830e+00 -3.295636e-01 8.399298e-01 -7.303813e-01 5.301726e-01

[2326] -9.828970e-01 -2.475927e+00 8.508039e-01 -3.365835e-01 -7.427311e-01 1.767471e-01 1.578532e-01 6.459751e-02 1.160118e+00 5.929347e-01 -1.221537e+00 5.818149e-01 -1.322706e+00 -1.804515e+00 6.780929e-01

[2341] 7.973429e-01 5.993253e-01 -5.388722e-01 -8.071660e-01 1.434781e-01 -1.625133e-01 -4.375158e-01 -9.713734e-01 -1.087162e+00 -1.600233e-01 7.269775e-01 1.839180e+00 -9.042980e-01 9.380652e-01 -3.949136e-01

[2356] -1.141744e+00 4.645395e-01 1.633493e+00 6.148708e-01 1.516572e-01 2.185474e-01 -4.788660e-01 2.058008e-03 1.343410e-01 3.614269e-01 -6.783092e-01 4.519396e-01 8.387589e-01 4.762476e-01 1.217398e-01

[2371] 1.137150e+00 3.326573e-01 2.277343e+00 -7.805169e-02 1.943805e-01 -1.490506e+00 -1.828037e-01 -3.942873e-01 2.195013e-01 -1.369879e-01 -5.279536e-01 1.878042e+00 2.866389e-01 6.039379e-01 -1.787570e+00

[2386] 1.389775e+00 -4.737550e-01 1.195728e-01 8.270775e-02 6.939494e-01 7.198178e-01 3.606564e-01 -2.830160e-01 -8.940728e-01 -1.342424e+00 1.273791e+00 1.470579e+00 -2.315558e-02 -6.442169e-01 -1.241741e+00

[2401] -1.258040e+00 -8.880543e-01 2.084341e+00 7.161479e-01 -2.697239e-01 5.508480e-02 -1.436407e+00 -8.383955e-01 3.879592e-03 1.993355e-01 1.156026e+00 -5.616668e-01 7.471566e-01 1.160211e+00 1.576170e-01

[2416] 9.073361e-01 -3.041582e-01 -1.178104e+00 -1.182043e+00 -3.269021e-01 -1.079907e+00 -2.199497e+00 -3.036092e-01 -2.628828e+00 2.395925e-01 -7.619532e-01 1.607706e+00 1.260821e+00 -1.248755e-01 1.191730e+00

[2431] -6.468285e-01 1.150568e-01 -8.554276e-01 -3.564418e-01 9.112368e-02 1.419327e+00 -2.614348e-01 4.351560e-02 -1.364907e+00 -1.615028e+00 1.640068e+00 3.923912e-01 -1.061556e+00 2.256267e-01 -2.103402e+00

[2446] 2.891716e-01 -1.843670e+00 -4.148190e-01 -2.000418e-01 -8.067571e-01 1.360899e-01 -1.263474e+00 -1.117943e+00 2.580010e-01 8.652021e-01 -1.067063e+00 -1.720738e+00 1.327986e+00 -1.019346e+00 7.066318e-01

[2461] -1.680136e-01 -7.170448e-01 -1.427317e+00 -1.442580e+00 1.540313e-02 3.588545e-01 -2.523970e-01 6.068360e-01 -2.480433e-01 -3.222251e-01 3.657939e-01 -2.681406e-01 -4.171803e-01 5.878607e-01 -1.379674e+00

[2476] -1.743602e+00 -7.068544e-01 7.082320e-02 6.895368e-02 9.773488e-01 -1.205117e+00 -1.019130e+00 -9.402557e-01 -1.276252e-01 -9.217772e-01 -1.165575e+00 -6.000436e-02 -1.076832e+00 1.006993e+00 2.551037e-01

[2491] 1.326944e+00 9.802466e-01 -6.505990e-02 -1.574877e-01 -2.465030e-02 -9.102777e-01 1.271699e+00 -2.966652e-01 1.115402e-01 2.371504e-01

> plot(random)

> plot(random,xlab="Days",ylab="Deviates",main="Random Deviates by Days")

> plot(random,xlab="Days",ylab="Deviates",main="Random Deviates by Days",breaks=100)

Warning messages:

1: In plot.window(...) : "breaks" is not a graphical parameter

2: In plot.xy(xy, type, ...) : "breaks" is not a graphical parameter

3: In axis(side = side, at = at, labels = labels, ...) :

"breaks" is not a graphical parameter

4: In axis(side = side, at = at, labels = labels, ...) :

"breaks" is not a graphical parameter

5: In box(...) : "breaks" is not a graphical parameter

6: In title(...) : "breaks" is not a graphical parameter

> hist(random,xlab="Days",ylab="Deviates",main="Random Deviates by Days",breaks=100)

> head(dataset)

Date Open High Low Close Adj.Close Volume LGFet

2 1/4/2006 6.141667 6.230000 6.120000 6.175000 2.634542 1293600 0.5427198

3 1/5/2006 6.258333 6.280000 6.085000 6.116667 2.609655 1296400 -0.9446424

4 1/6/2006 6.283333 6.375000 6.266667 6.326667 2.699250 2917200 3.4332124

5 1/9/2006 6.308333 6.601666 6.308333 6.541667 2.790979 2010400 3.3983143

6 1/10/2006 6.541667 6.780000 6.490000 6.698333 2.857820 2080800 2.3948944

7 1/11/2006 6.680000 6.708333 6.565000 6.598333 2.815156 1474800 -1.4928862

> dataset$DR=dataset$High-dataset$Low

> head(dataset)

Date Open High Low Close Adj.Close Volume LGFet DR

2 1/4/2006 6.141667 6.230000 6.120000 6.175000 2.634542 1293600 0.5427198 0.110000

3 1/5/2006 6.258333 6.280000 6.085000 6.116667 2.609655 1296400 -0.9446424 0.195000

4 1/6/2006 6.283333 6.375000 6.266667 6.326667 2.699250 2917200 3.4332124 0.108333

5 1/9/2006 6.308333 6.601666 6.308333 6.541667 2.790979 2010400 3.3983143 0.293333

6 1/10/2006 6.541667 6.780000 6.490000 6.698333 2.857820 2080800 2.3948944 0.290000

7 1/11/2006 6.680000 6.708333 6.565000 6.598333 2.815156 1474800 -1.4928862 0.143333

> hist(dataset$DR,xlab="Days,ylab="Daily Range",main="Daily Ranger per Day")

Error: unexpected symbol in "hist(dataset$DR,xlab="Days,ylab="Daily"

> hist(dataset$DR,xlab="Days",ylab="Daily Range",main="Daily Ranger per Day")

> hist(dataset$DR,xlab="Days",ylab="Daily Range",main="Daily Ranger per Day",breaks=100)

> hist(dataset$DR,ylab="Days",xlab="Daily Range",main="Daily Ranger per Day",breaks=100)

> plot(dataset$DR,ylab="Days",xlab="Daily Range",main="Daily Ranger per Day")

> plot(dataset$DR,xlab="Days",ylab="Daily Range",main="Daily Ranger per Day")

> ?log

starting httpd help server ... done

> drlog=log(dataset$DR)

> drlog

[1] -2.207274913 -1.634755720 -2.222545462 -1.226446797 -1.237874356 -1.942584685 -1.476945810 -2.813410717 -2.092867265 -1.484277711 -1.822216615 -0.494296322 -1.192924067 -1.634755720 -1.919597386 -2.525728644 -1.897119985

[18] -2.445682090 -2.222545462 -0.903868212 -1.832575214 -1.966112856 -0.380772983 -1.448169765 -1.108662625 -1.328025453 -1.733488674 -2.207274913 -0.891598119 -1.822216615 -2.120255203 -1.626248421 -2.027479271 -1.724102690

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[52] -1.705579938 -1.529393666 -1.660731207 -1.576651315 -1.705585443 -1.724102690 -1.353505829 -1.584745300 -1.733488674 -1.781805178 -1.054593489 -1.373050450 -2.106467474 -1.724102690 -0.809678750 -1.781811119 -1.560647748

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[3231] 1.226712291 0.425269696 0.173952467 -0.072569618 0.647103242 0.292669614 0.553883964 -0.301107795 0.300106815 0.488580628 0.662689519 -0.314710745 -0.162515400 0.307485435 -0.186327169 -0.446282415 -0.446288665

[3248] 0.488581242 0.570979547 -0.116534940 0.086177696 0.683096845 1.071584301 0.314812930 0.398777462 0.598836501 0.357674444 -0.020203728 0.058266078 0.215109767 0.500776500 -0.094311778 0.693147181 0.215109767

[3265] 0.570979547 0.157005458 0.708034808 0.262363495 0.207013356 -0.030458177 0.631272309 0.009948351 0.277631737 0.565312673 -0.116534940 -0.072570693 -0.430785993 -0.616184288 -0.314712115 0.277631737 -0.301102390

[3282] 0.173951626 0.418710335 -0.010048316 0.371563556 -0.328508234 0.076959189 0.364645197 0.989542309 0.277630979 -0.634872612 -0.116533816 0.418710993 -0.478037414 -0.248457513 0.029557831 0.076959189 -0.385668363

[3299] 0.076962893 -0.356673515 -0.371059334 -0.261369959 0.086178614 -0.446288665 -0.287682072 -0.544730624 -0.446288665 -0.186331988 -0.083379435 -0.198452158 -0.150827541 -0.105358293 -0.385662481 -0.616184288 0.277634767

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[3350] -0.544730624 -0.527631047 0.530628839 0.231113308 -0.010049326 -0.051292242 -0.061873276 -0.210724735 0.157002894 0.285180446 0.122218518 0.470004879 -0.235721068 -0.356680658 1.695615058 0.824175004 -0.094310679

[3367] -0.186331988 -0.127836781 0.000000000 -0.843967745 0.231113308 0.476234800 -0.261364764 -0.314710745 -0.040823036 0.371564246 0.277631737 0.300103111 0.000000000 -0.287682072 -0.430781378 -0.051292242 -0.400480552

[3384] -0.301107795 -0.755028967 0.139763682 -0.371065131 -0.139263217 -0.356679230 -0.371066580 -0.653924544 -0.597829728 -0.314712115 0.198851678 0.285177438 -0.261363465 -0.562118918 -0.030457146 0.500776500 -0.162521282

[3401] 0.104360916 -0.094310679 0.322084224 0.412108989 -0.010052356 -0.235721068 -0.371059334 -0.105359405 -0.198450939 0.086177696 -0.328501289 -0.235721068 -0.274439477 0.336473665 1.467874348 0.683096845 0.875467904

[3418] -0.030458177 0.122214978 0.270024847 0.378435751 0.231110927 -0.415515444 -0.713345806 0.378438491 -0.579823852 0.336470094 0.708034808 0.067658648 -0.562118918 -0.994254976 0.019802627 0.385260360 -0.261364764

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[3452] 0.314810010 0.095308362 0.292669614 -0.105362738 -0.274439477 -0.083383783 -0.544730624 0.741936869 0.405465108 -0.010053366 -0.494302879 -0.094310679 0.009948351 -0.301107795 0.190619533 0.392041412 -0.400474582

[3469] 0.113327792 -0.356673515 -0.061876468 0.254642994 -0.040823036 0.488578174 0.165515286 -0.210718562 -0.072570693 0.104360916 0.615184558 0.751415145 0.190619533 -0.371066580 -0.562118918 0.000000000 -0.248462641

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[3503] -0.198452158 0.190619533 0.000000000 -0.287682072 0.039221675 -0.274439477 -0.301107795 0.488580628 0.412108989 -0.116534940 -0.127836781 -0.116533816 -0.328502678 -0.776530963 -0.328501289 -0.527632742 -0.616191695

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[3537] -0.083383783 0.604314874 0.412108989 0.604317060 0.788457815 0.488578174 0.131027385 -0.094311778 -0.210719797 -0.198450939 0.122215863 0.058269852 0.412111638 0.131027385 -0.020202707 -0.733969175 -0.478037414

[3554] -0.010049326 -0.415516959 -0.235726131 -0.916285732 0.148420005 0.350658280 0.524727346 1.335001856 0.463734016 0.845867409 1.187843118 0.912283514 0.978327627 0.896088433 0.858661619 0.912283514 0.314810010

[3571] 0.912283514 1.057790641 0.879626748 0.963173936 1.545432369 0.875467904 1.108563610 0.774726707 0.576614488 1.018847320 0.343589704 0.722706954 0.912281506 0.392041412 0.570980112 0.636576829 0.314810010

[3588] 0.688133634 0.708035300 0.378435751 0.576612803 0.300103852 0.095308362 -0.040823036 0.000000000 0.067658648 0.215112993 0.285180446 0.470004879 -0.061876468 0.292669614 0.722705012 -0.010052356 -0.510828957

[3605] 0.431780468 0.104360916 0.122218518 0.322082050 0.494695632 0.239016900 0.113331364 -0.579814924 0.647103242 0.792992063 0.609765572 0.457426113 0.722706468 0.350658280 -0.430779839 -0.371065131 -0.094311778

[3622] 0.732366932 0.662689004 0.314812930 0.444687103 -0.385662481 -0.385662481 0.598838699 0.292669614 -0.061872212 0.672943963 0.336472951 -0.061877531 0.029557831 0.824175004 0.765468772 0.760805829 -0.301102390

[3639] 0.048793021 0.688133634 0.207017421 -0.544723727 0.732366932 0.095309271 0.086177696 0.598835952 0.262364264 0.173955828 0.029556860 -0.198452158 -0.274439477 -0.342486084 -0.162520106 0.019802627 -0.385662481

[3656] 0.609766115

> plot(drlog,xlab="Days",ylab="Daily Range",main="Daily Ranger per Day")

> hist(drlog,xlab="Days",ylab="Daily Range",main="Daily Ranger per Day",breaks=100)

> hist(drlog,ylab="Days",xlab="Daily Range",main="Daily Range per Day",breaks=100)

> plot(drlog,xlab="Days",ylab="Daily Range",main="Daily Range per Day")

> plot(dataset$DR,xlab="Days",ylab="Daily Range",main="Daily Range per Day")

> hist(dataset$DR,ylab="Days",xlab="Daily Range",main="Daily Range per Day",breaks=100)

>