```mathematica
trans = Drop[Import["/Users/cody/Documents/fin/port
      Mathematica/AllTransactions_20100804001838.CSV"], -1];

latest = {{"AAPL", 35}, {"APWR", 250}, {"COST", 125}, {"FMCN", 150}, {"GOOG", 10},
    {"HANS", 52}, {"HMC", 75}, {"IBM", 30}, {"PBD", 200}, {"PWR", 50},
    {"PZD", 100}, {"SIRI", 2500}, {"STEM", 250}, {"TAN", 200}, {"VEA", 50},
    {"VWO", 150}, {"fbt", 200}, {"PSJ", 75}, {"QCLN", 100}, {"EPI", 150},
    {"IXJ", 50}, {"BWX", 50}, {"LQD", 50}, {"PCY", 200}, {"PZA", 200}, {"TIP", 25},
    {"jnk", 100}, {"RJI", 500}, {"fxa", 50}, {"gcc", 200}, {"Cash", 41.51}};

Dimensions[trans]
```

{178, 15}

```mathematica
trans[[1]]
```

{Symbol, Quantity, Price, ActionNameUS, TradeDate, SettledDate, Interest, Amount,
 Commission, Fees, CUSIP, Description, ActionId, TradeNumber, RecordType}

```mathematica
transtypes = Union[Drop[trans, 1][[All, 4]]]
```

{Buy, Cash Adjustment, Credit Interest, Dividend, Journal, Margin Interest, Sell}

```mathematica
(*all cash except buy & sell.  Cash
 Adjustment with Symbol Cash means new money in.*)

trans[[Range[111, 117], 5]]
(*don't know what this is for...looking to identify a certain date?*)
```

{10/31/2009, 10/31/2009, 10/30/2009, 10/30/2009, 10/22/2009, 10/22/2009, 10/21/2009}

```mathematica
trans[[{66, 67}, 5]]
```

{1/5/2010, 12/31/2009}

```mathematica
allsym = Sort[Union[Join[latest[[All, 1]], Drop[trans, 1][[Range[73], 1]]]]]
 (*66 transactions this year so far*)
```

{AAPL, APWR, BWX, Cash, CERN, COST, EPI, fbt, FMCN, fxa,
 FXA, gcc, GCC, GOOG, HANS, HMC, IBM, IXJ, jnk, JNK, LQD, PBD, PCY,
 PSJ, PWR, PZA, PZD, QCLN, RJI, SIRI, STEM, TAN, TIP, VEA, VWO}

```mathematica
Length[allsym]
```

35

```mathematica
startdate = "12/31/09"; enddate = Take[Date[], 3](*-{0,0,1}*);

dates = FinancialData[allsym[[1]], {startdate, enddate}][[All, 1]];
quotes =
  Table[FinancialData[allsym[[i]], startdate][[All, 2]], {i, Length[allsym]}];

quotes[[4]] = quotes[[4]] / quotes[[4]];

{dates[[1]], dates[[-1]]}
```

{{2009, 12, 31}, {2010, 8, 6}}

```
Dimensions[quotes]
```

{35, 151}

```
quotes = Transpose[quotes];
```

```
Dimensions[quotes]
```

{151, 35}

```
Length[dates]
```

151

```
positions = quotes - quotes;
```

```
positions[[-1]] = Table[p = Position[latest, allsym[[i]]];
  If[p == {}, 0, Extract[latest, {p[[1, 1]]}][[2]]], {i, Length[allsym]}]
```

{35, 250, 50, 41.51, 0, 125, 150, 200, 150, 50, 0, 200, 0, 10, 52, 75, 30, 50,
 100, 0, 50, 200, 200, 75, 50, 200, 100, 100, 500, 2500, 250, 200, 25, 50, 150}

```
datetest[d_, t_] :=
 Module[{}, diff = Map[Sign, DateList[d] - DateList[{t, {"Month", "Day", "Year"}}]];
  Switch[diff[[1]], -1, -1, 1, 1, 0,
    Switch[diff[[2]], -1, -1, 1, 1, 0,
     Switch[diff[[3]], -1, -1, 1, 1, 0, 0]
    ]]]
```

```
pval = Table[0, {Length[dates]}]; pval[[-1]] = Dot[quotes[[-1]], positions[[-1]]]
```

108 459.

```
datetestt[t1_, t2_] :=
 Module[{}, diff = Map[Sign, DateList[{t1, {"Month", "Day", "Year"}}] -
     DateList[{t2, {"Month", "Day", "Year"}}]];
  Switch[diff[[1]], -1, -1, 1, 1, 0,
    Switch[diff[[2]], -1, -1, 1, 1, 0,
     Switch[diff[[3]], -1, -1, 1, 1, 0, 0]
    ]]]
```

```
(*dates, positions, quotes, pval all go forward in time.  trans goes backward,
and we have to back out the transactions starting with latest
 portfolio and seeing what the portfolio was on each day in the past*)
```

```
transplace = 2; dateplace = 1;
Do[test = datetest[dates[[-(dateplace + 1)]], trans[[transplace, 5]]];
 Switch[test, 1, (*Dateplace is after transplace.  Portfolio uncchanged,
   so get next quotes.  copy positions to next row, multiply by quotes,
   write out portvalue.  Advance dateplace.  Do not advance transplace.*)
   positions[[-(dateplace + 1)]] = positions[[-dateplace]];
   pval[[-(dateplace + 1)]] =
    Dot[quotes[[-(dateplace + 1)]], positions[[-(dateplace + 1)]]];
   dateplace++,

   0, (* dateplace = transplace.  back out ALL transactions for this date,
   do not advance dateplace until all transactions backed out,
   transplace++ however many times*)
   positions[[-(dateplace + 1)]] = positions[[-dateplace]];

   If[trans[[transplace, 4]] == "Buy" || trans[[transplace, 4]] == "Sell",
    p = Position[allsym, trans[[transplace, 1]]];
    positions[[-(dateplace + 1), {p[[1, 1]], 4}]] -= trans[[transplace, {2, 8}]]],
    (*back out buy/sell*)

    positions[[-(dateplace + 1), 4]] -= trans[[transplace, 8]]];
   (*Back out cash*)
   While[
    datetestt[trans[[transplace, 5]], trans[[transplace + 1, 5]]] == 0, transplace++;
    If[trans[[transplace, 4]] == "Buy" || trans[[transplace, 4]] == "Sell",
     p = Position[allsym, trans[[transplace, 1]]];
     positions[[-(dateplace + 1), {p[[1, 1]], 4}]] -= trans[[transplace, {2, 8}]]],
     (*back out buy/sell*)

     positions[[-(dateplace + 1), 4]] -= trans[[transplace, 8]]]
     (*Back out cash*)];
   pval[[-(dateplace + 1)]] = Dot[quotes[[-(dateplace + 1)]],
     positions[[-(dateplace + 1)]]];
   dateplace++; transplace++

   (*back to switch*), -1,
   While[
    datetestt[trans[[transplace, 5]], trans[[transplace + 1, 5]]] == -1, transplace++;
    If[trans[[transplace, 4]] == "Buy" || trans[[transplace, 4]] == "Sell",
     p = Position[allsym, trans[[transplace, 1]]];
     positions[[-(dateplace + 1), {p[[1, 1]], 4}]] -= trans[[transplace, {2, 8}]]],
     (*back out buy/sell*)

     positions[[-(dateplace + 1), 4]] -= trans[[transplace, 8]]]
     (*Back out cash*)];
   pval[[-(dateplace + 1)]] = Dot[quotes[[-(dateplace + 1)]],
     positions[[-(dateplace + 1)]]];
   transplace++(*?* dateplace is before transplace. dividend paid on non-
     trading day.  process transactions (while,...ransplace++) into
      positions of next valid date. dateplace++*)], {Length[dates] + 10}]
```

Part:partw Part−152 of
    {{2009, 12, 31}, {2010, 1, 4}, {2010, 1, 5}, {2010, 1, 6}, {2010, 1, 7}, {2010, 1, 8}, {2010, 1, 11}, {2010, 1, 12}, {2010, 1, 13}, {
        2010, 1, 14}, ≪141≫} doesnotexist ≫

DateList:arg: Argument
  {{2009, 12, 31}, {2010, 1, 4}, {2010, 1, 5}, {2010, 1, 6}, {2010, 1, 7}, {2010, 1, 8}, {2010, 1, 11}, {2010, 1, 12}, {2010, 1, 13}, {
    2010, 1, 14}, ≪141≫}[[−152]] cannot be interpreted as a date or time input ≫

Part:partw: Part −152 of
  {{2009, 12, 31}, {2010, 1, 4}, {2010, 1, 5}, {2010, 1, 6}, {2010, 1, 7}, {2010, 1, 8}, {2010, 1, 11}, {2010, 1, 12}, {2010, 1, 13}, {
    2010, 1, 14}, ≪141≫} does not exist ≫

DateList:arg: Argument
  {{2009, 12, 31}, {2010, 1, 4}, {2010, 1, 5}, {2010, 1, 6}, {2010, 1, 7}, {2010, 1, 8}, {2010, 1, 11}, {2010, 1, 12}, {2010, 1, 13}, {
    2010, 1, 14}, ≪141≫}[[−152]] cannot be interpreted as a date or time input ≫

Part:partw: Part −152 of
  {{2009, 12, 31}, {2010, 1, 4}, {2010, 1, 5}, {2010, 1, 6}, {2010, 1, 7}, {2010, 1, 8}, {2010, 1, 11}, {2010, 1, 12}, {2010, 1, 13}, {
    2010, 1, 14}, ≪141≫} does not exist ≫

General:stop: Further output of Part:partw will be suppressed during this calculation ≫

DateList:arg: Argument
  {{2009, 12, 31}, {2010, 1, 4}, {2010, 1, 5}, {2010, 1, 6}, {2010, 1, 7}, {2010, 1, 8}, {2010, 1, 11}, {2010, 1, 12}, {2010, 1, 13}, {
    2010, 1, 14}, ≪141≫}[[−152]] cannot be interpreted as a date or time input ≫

General:stop: Further output of DateList:arg will be suppressed during this calculation ≫

(*need to just do the trans I'm interested in?*)

**(*if you want to check the positions over the year to see if this worked,
{Transpose[positions],allsym}//TableForm*)**

pval

{98 873.6, 100 521., 101 577., 101 695., 101 156., 101 509., 101 719., 100 513., 100 903.,
 100 759., 99 686.9, 100 828., 99 480.9, 97 386.8, 95 219.6, 95 740.9, 95 385.3,
 95 417.6, 94 476.5, 93 230.6, 94 563.4, 95 599.7, 95 440.7, 92 855.4, 92 827.4,
 92 248., 93 494.5, 93 094.8, 94 261.4, 94 228., 96 124.5, 96 500.4, 97 002.5, 96 504.1,
 96 843.7, 95 780.6, 96 382.6, 96 307.7, 96 684.1, 97 693.1, 98 062.7, 98 331.3,
 98 243.5, 99 583.8, 99 236., 99 477.1, 100 227., 100 727., 100 966., 100 550., 100 840.,
 101 148., 100 908., 100 125., 100 597., 101 136., 100 494., 100 106., 100 407.,
 100 854., 101 167., 100 883., 101 240., 101 898., 101 931., 101 872., 102 049.,
 102 561., 102 426., 102 448., 103 504., 103 772., 102 263., 102 042., 102 652.,
 102 864., 102 994., 103 667., 103 657., 101 754., 101 948., 103 249., 102 004.,
 102 928., 100 444., 99 036.5, 95 927.4, 94 809., 98 819.1, 98 124.2, 99 285.6, 98 890.1,
 97 597.3, 97 360.6, 96 564.9, 95 633.6, 92 700.3, 94 066.6, 93 599.8, 93 044.4,
 92 538.7, 95 751.7, 95 160.3, 94 334.2, 95 804.4, 96 101.5, 93 900., 92 607.9, 92 970.2,
 92 849.6, 95 274.7, 95 737.5, 95 803.5, 97 735.3, 97 815.6, 98 177.5, 98 273.8,
 98 265.5, 97 572.7, 97 522.6, 96 528.8, 97 112.9, 97 063.7, 94 163.5, 93 501.2,
 93 279., 93 224.8, 93 579.9, 95 477.5, 96 396.8, 97 196.3, 96 564., 97 454., 97 588.6,
 97 690.5, 95 730.5, 95 929.8, 96 902., 96 390.4, 98 009.1, 98 873., 99 461.1, 99 510.,
 105 878., 105 905., 106 359., 107 872., 107 670., 108 506., 108 304., 108 459.}

```
DateListPlot[Transpose[{dates, pval}], Joined → True]
```
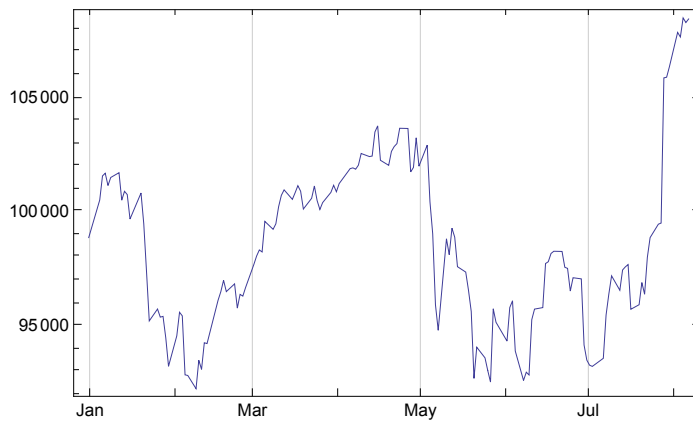


```
(*To calculate returns, take special notice of cash in*)
```

```
cashin = Extract[Take[trans, 116], Position[
   trans[[Range[66], {1, 4}]], {"Cash", "Cash Adjustment"}]]; cashin // TableForm
```

```
Cash 0 0 Cash Adjustment 7/27/2010   7250. 0 0        MONEY DIRECT DEPOSIT 16
```

```
cashindates = Flatten[
  Table[Position[dates, Take[DateList[cashin[[i, 5]]], 3]], {i, Length[cashin]}]]
```

$\{143\}$

```
preturns = Table[Log[pval[[i]] / pval[[i - 1]]], {i, 2, Length[pval]}];
Do[preturns[[cashindates[[i]]]] =
  Log[pval[[cashindates[[i]] + 1]] / (pval[[cashindates[[i]]]] + cashin[[i, 8]])], {i,
  Length[cashin]}]
```
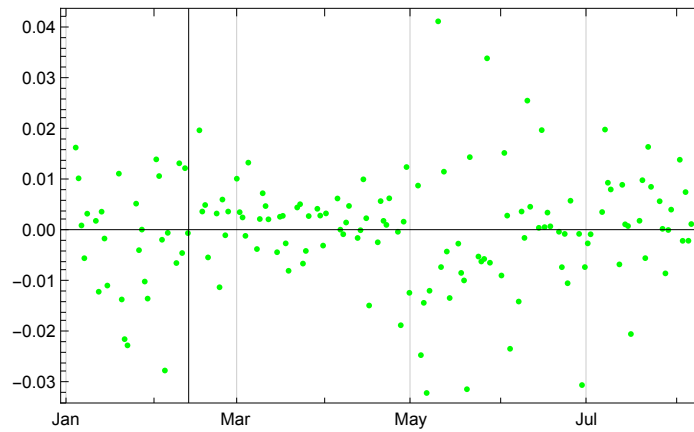
```
annportret = Exp[Total[preturns]] - 1
```

0.0224554

```
Sqrt[Length[dates]] * StandardDeviation[preturns]
```

0.136358

```
prplot = DateListPlot[Transpose[{Drop[dates, 1], preturns}],
   PlotRange -> All, Axes → True, PlotStyle → Green]
```



```
qrisk = Table[Sqrt[Length[dates]] *
   StandardDeviation[Take[preturns, {63 * (i - 1) + 1, 63 i}]], {i, 4}]
```

Take::take: Cannot take positions 127 through 189 in
   {0.0165236, 0.0104529, 0.00115678, −0.00530755, ≪22≫, ≪21≫, −≪21≫, ≪21≫, −0.00142496, −0.0107011, ≪140≫}

.

≫

Take::take: Cannot take positions 190 through 252 in
   {0.0165236, 0.0104529, 0.00115678, −0.00530755, ≪22≫, ≪21≫, −≪21≫, ≪21≫, −0.00142496, −0.0107011, ≪140≫}

.

≫

```
{0.111745, 0.164316,
 √151 StandardDeviation[Take[{0.0165236, 0.0104529, 0.00115678, -0.00530755,
     0.00347884, 0.0020637, -0.0119215, 0.00387169, -0.00142496, -0.0107011,
     0.0113781, -0.0134467, -0.0212749, -0.0225049, 0.00545989, -0.00372121,
     0.00033836, -0.00991139, -0.0132756, 0.0141946, 0.0108986, -0.00166384,
     -0.0274624, -0.00030159, -0.00626028, 0.0134214, -0.00428418,
     0.0124538, -0.000354184, 0.0199267, 0.00390303, 0.00518867, -0.00515043,
     0.00351284, -0.0110389, 0.00626636, -0.000778348, 0.0039011, 0.0103823,
     0.00377542, 0.00273603, -0.000893604, 0.0135504, -0.00349895, 0.00242672,
     0.00750955, 0.00497945, 0.00236726, -0.00412493, 0.00287413, 0.00305523,
     -0.00238013, -0.00778872, 0.00470055, 0.005346, -0.00636822, -0.0038707,
     0.00300361, 0.00444568, 0.00310056, -0.00281693, 0.00353232, 0.00647751,
     0.000324587, -0.000577421, 0.00173656, 0.005003, -0.00131511, 0.000215059,
     0.0102554, 0.00258072, -0.0146396, -0.0021645, 0.00595768, 0.00206261,
     0.00126504, 0.0065099, -0.0000914509, -0.0185322, 0.00190248, 0.0126776,
     -0.0121313, 0.00902122, -0.02443, -0.0141109, -0.031897, -0.0117271,
     0.0414261, -0.00705637, 0.0117665, -0.00399141, -0.0131602, -0.00242729,
     -0.0082068, -0.00969099, -0.0311531, 0.0146317, -0.0049749, -0.0059507,
     -0.00545029, 0.0341309, -0.00619555, -0.00871809, 0.0154641, 0.00309642,
     -0.0231744, -0.0138562, 0.00390478, -0.00129749, 0.025783, 0.00484567,
     0.00068873, 0.019964, 0.000821167, 0.00369258, 0.000980905, -0.000084665,
     -0.00707546, -0.000512775, -0.0102433, 0.00603291, -0.000506961,
     -0.0303341, -0.00705879, -0.0023797, -0.000580685, 0.00380194,
     0.0200746, 0.00958291, 0.00825912, -0.00652664, 0.00917447, 0.00138052,
     0.00104292, -0.0202667, 0.00207962, 0.0100832, -0.00529344, 0.016654,
     0.00877576, 0.00593052, 0.000490926, -0.0083, 0.000258756, 0.00427921,
     0.0141202, -0.00187445, 0.00773691, -0.001862, 0.00143253}, {127, 189}]],
 √151 StandardDeviation[Take[{0.0165236, 0.0104529, 0.00115678, -0.00530755,
     0.00347884, 0.0020637, -0.0119215, 0.00387169, -0.00142496, -0.0107011,
     0.0113781, -0.0134467, -0.0212749, -0.0225049, 0.00545989, -0.00372121,
     0.00033836, -0.00991139, -0.0132756, 0.0141946, 0.0108986, -0.00166384,
     -0.0274624, -0.00030159, -0.00626028, 0.0134214, -0.00428418,
     0.0124538, -0.000354184, 0.0199267, 0.00390303, 0.00518867, -0.00515043,
     0.00351284, -0.0110389, 0.00626636, -0.000778348, 0.0039011, 0.0103823,
     0.00377542, 0.00273603, -0.000893604, 0.0135504, -0.00349895, 0.00242672,
     0.00750955, 0.00497945, 0.00236726, -0.00412493, 0.00287413, 0.00305523,
     -0.00238013, -0.00778872, 0.00470055, 0.005346, -0.00636822, -0.0038707,
     0.00300361, 0.00444568, 0.00310056, -0.00281693, 0.00353232, 0.00647751,
     0.000324587, -0.000577421, 0.00173656, 0.005003, -0.00131511, 0.000215059,
     0.0102554, 0.00258072, -0.0146396, -0.0021645, 0.00595768, 0.00206261,
     0.00126504, 0.0065099, -0.0000914509, -0.0185322, 0.00190248, 0.0126776,
     -0.0121313, 0.00902122, -0.02443, -0.0141109, -0.031897, -0.0117271,
     0.0414261, -0.00705637, 0.0117665, -0.00399141, -0.0131602, -0.00242729,
     -0.0082068, -0.00969099, -0.0311531, 0.0146317, -0.0049749, -0.0059507,
     -0.00545029, 0.0341309, -0.00619555, -0.00871809, 0.0154641, 0.00309642,
     -0.0231744, -0.0138562, 0.00390478, -0.00129749, 0.025783, 0.00484567,
     0.00068873, 0.019964, 0.000821167, 0.00369258, 0.000980905, -0.000084665,
     -0.00707546, -0.000512775, -0.0102433, 0.00603291, -0.000506961,
     -0.0303341, -0.00705879, -0.0023797, -0.000580685, 0.00380194,
     0.0200746, 0.00958291, 0.00825912, -0.00652664, 0.00917447, 0.00138052,
     0.00104292, -0.0202667, 0.00207962, 0.0100832, -0.00529344, 0.016654,
     0.00877576, 0.00593052, 0.000490926, -0.0083, 0.000258756, 0.00427921,
     0.0141202, -0.00187445, 0.00773691, -0.001862, 0.00143253}, {190, 252}]]]}
```

$$\texttt{qret = Table}\big[\texttt{Exp}\big[\texttt{Total}\big[\texttt{Take}\big[\texttt{preturns, }\{63 * (i - 1) + 1,\ 63\,i\}\big]\big]\big],\ \{i, 4\}\big] - 1$$

Take::take: Cannot take positions 127 through 189 in
{0.0165236, 0.0104529, 0.00115678, −0.00530755 ≪22≫, ≪21≫, −≪21≫, ≪21≫, −0.0014249 6, −0.0107011, ≪140≫}
.
≫

Total::tllen: Lists of unequal length in RowBox[{"Take", "[", RowBox[{\(\({0.0165236066327187 04`
0.0104529453014012 2`, 0.0011567763686498862`−0.00530755189260942 1`, \(≪
4 ≫\), \(−0.0014249557261315955`\(−0.0107011243918825 97`, \(≪ 140 ≫\)}\)}\), ",",
RowBox[{"{", RowBox[{"127", ",", RowBox[{"", \(≪ 3 ≫\), ""}]}], "}"}]}], "]"}] cannot be added ≫

Take::take: Cannot take positions 190 through 252 in
{0.0165236, 0.0104529, 0.00115678, −0.00530755 ≪22≫, ≪21≫, −≪21≫, ≪21≫, −0.0014249 6, −0.0107011, ≪140≫}
.
≫

Total::tllen: Lists of unequal length in RowBox[{"Take", "[", RowBox[{\(\({0.0165236066327187 04`
0.0104529453014012 2`, 0.0011567763686498862`−0.00530755189260942 1`, \(≪
4 ≫\), \(−0.0014249557261315955`\(−0.0107011243918825 97`, \(≪ 140 ≫\)}\)}\), ",",
RowBox[{"{", RowBox[{"190", ",", RowBox[{"", \(≪ 3 ≫\), ""}]}], "}"}]}], "]"}] cannot be added ≫

$\Big\{0.030586,\ -0.0851136,\ -1 +$
$e^{\texttt{Total[Take[\{0.0165236,0.0104529,0.00115678,-0.00530755,0.00347884,0.0020637,-0.0119215,0.00387169,-0.00142496,-0.}}}$

$,$
$-1 +$
$e^{\texttt{Total[Take[\{0.0165236,0.0104529,0.00115678,-0.00530755,0.00347884,0.0020637,-0.0119215,0.00387169,-0.00142496,-0.}}}$
$\Big\}$

$$\texttt{(qret - .0025)} \big/ \texttt{qrisk (*risk free was about 1\% the whole year.\ \ Could look it up*)}$$

$\Big\{0.235398,\ -0.559246,\ \big(-1.0025 +$
$e^{\texttt{Total[Take[\{0.0165469,0.0106368,0.00152088,-0.00537687,0.00341116,0.00229496,-0.0119294,0.00365599,-0.0013284,}}}$

$\big) \big/ \Big(\sqrt{149}\ \texttt{StandardDeviation}\big[$

Take$\big[$\{0.0165469, 0.0106368, 0.00152088, −0.00537687, 0.00341116, 0.00229496,
−0.0119294, 0.00365599, −0.0013284, −0.0105719, 0.0106948, −0.0134021,
−0.0213574, −0.0218965, 0.00501003, −0.00411188, 0.000141188, −0.00920866,
−0.0127722, 0.0142065, 0.0110037, −0.00205883, −0.0272642, −0.000683005,
−0.00624573, 0.0134791, −0.00425796, 0.0123349, −0.000547103, 0.0200305,
0.00407959, 0.00526173, −0.00512956, 0.00371877, −0.0109099, 0.00601499,
−0.000940005, 0.00370698, 0.0101497, 0.00386849, 0.00274508, −0.00105638,
0.0129972, −0.00359046, 0.00207596, 0.00749394, 0.0050285, 0.00230952,
−0.0039383, 0.00287705, 0.00315744, −0.00248737, −0.00772012, 0.00455196,
0.00510173, −0.00661739, −0.00368253, 0.00263942, 0.00439802, 0.00282292,
−0.00279746, 0.00351764, 0.00637716, 0.000226837, −0.000697752,
0.00184341, 0.0049385, −0.00139662, 0.000206233, 0.0101811, 0.00232408,
−0.014847, −0.00218165, 0.00634834, 0.000651818, 0.000575261, 0.00625226,
0.0000378294, −0.0182783, 0.00199966, 0.0123071, −0.0116982, 0.00873396,
−0.0243014, −0.014205, −0.0317148, −0.0109146, 0.0405781, −0.00750333,
0.0115084, −0.00371172, −0.0130353, −0.00253702, −0.00822829,
−0.00951874, −0.0308285, 0.0145168, −0.00559602, −0.00594112,
−0.00547392, 0.0340453, −0.00674429, −0.00939296, 0.0155689, 0.00327214,
−0.023049, −0.0136904, 0.00419043, −0.000654945, 0.0256811, 0.00465342,
0.000624769, 0.0199335, 0.0000492854, 0.00331472, 0.000775269,
0.000321029, −0.00766265, −0.000223739, −0.0103287, 0.00644758,
−0.000687476, −0.0298853, −0.00674873, −0.00211246, −0.000426796,
0.00372224, 0.0195392, 0.00990827, 0.00832198, −0.00645714, 0.010004,
0.00131902, 0.00120488, −0.0206405, 0.00260025, 0.00967006, −0.00568435,

$$0.0166004, 0.0089156, 0.00615708, 8.66984 \times 10^{-6}, -0.00820774, 0.000541065,$$
$$0.00446792, 0.014031, -0.00192839, 0.0078313\}, \{127, 189\}]]\Big), \Big(-1.0025 +$$
$$e^{\text{Total}[\text{Take}[\{0.0165469,0.0106368,0.00152088,-0.00537687,0.00341116,0.00229496,-0.0119294,0.00365599,-0.0013284,}}$$
$$\Big) \Big/ \Big(\sqrt{149} \text{ StandardDeviation}\Big[$$

$\text{Take}\Big[\{0.0165469, 0.0106368, 0.00152088, -0.00537687, 0.00341116, 0.00229496,$
$\quad -0.0119294, 0.00365599, -0.0013284, -0.0105719, 0.0106948, -0.0134021,$
$\quad -0.0213574, -0.0218965, 0.00501003, -0.00411188, 0.000141188, -0.00920866,$
$\quad -0.0127722, 0.0142065, 0.0110037, -0.00205883, -0.0272642, -0.000683005,$
$\quad -0.00624573, 0.0134791, -0.00425796, 0.0123349, -0.000547103, 0.0200305,$
$\quad 0.00407959, 0.00526173, -0.00512956, 0.00371877, -0.0109099, 0.00601499,$
$\quad -0.000940005, 0.00370698, 0.0101497, 0.00386849, 0.00274508, -0.00105638,$
$\quad 0.0129972, -0.00359046, 0.00207596, 0.00749394, 0.0050285, 0.00230952,$
$\quad -0.0039383, 0.00287705, 0.00315744, -0.00248737, -0.00772012, 0.00455196,$
$\quad 0.00510173, -0.00661739, -0.00368253, 0.00263942, 0.00439802, 0.00282292,$
$\quad -0.00279746, 0.00351764, 0.00637716, 0.000226837, -0.000697752, 0.00184341,$
$\quad 0.0049385, -0.00139662, 0.000206233, 0.0101811, 0.00232408, -0.014847,$
$\quad -0.00218165, 0.00634834, 0.000651818, 0.000575261, 0.00625226, 0.0000378294,$
$\quad -0.0182783, 0.00199966, 0.0123071, -0.0116982, 0.00873396, -0.0243014,$
$\quad -0.014205, -0.0317148, -0.0109146, 0.0405781, -0.00750333, 0.0115084,$
$\quad -0.00371172, -0.0130353, -0.00253702, -0.00822829, -0.00951874, -0.0308285,$
$\quad 0.0145168, -0.00559602, -0.00594112, -0.00547392, 0.0340453, -0.00674429,$
$\quad -0.00939296, 0.0155689, 0.00327214, -0.023049, -0.0136904, 0.00419043,$
$\quad -0.000654945, 0.0256811, 0.00465342, 0.000624769, 0.0199335, 0.0000492854,$
$\quad 0.00331472, 0.000775269, 0.000321029, -0.00766265, -0.000223739,$
$\quad -0.0103287, 0.00644758, -0.000687476, -0.0298853, -0.00674873, -0.00211246,$
$\quad -0.000426796, 0.00372224, 0.0195392, 0.00990827, 0.00832198, -0.00645714,$
$\quad 0.010004, 0.00131902, 0.00120488, -0.0206405, 0.00260025, 0.00967006,$
$\quad -0.00568435, 0.0166004, 0.0089156, 0.00615708, 8.66984 \times 10^{-6}, -0.00820774,$
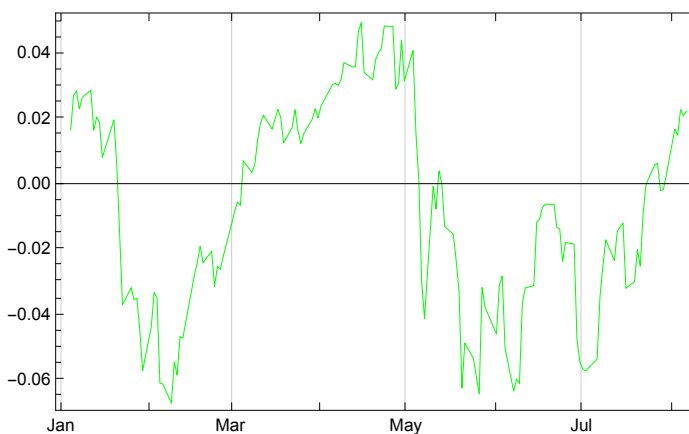$\quad 0.000541065, 0.00446792, 0.014031, -0.00192839, 0.0078313\}, \{190, 252\}]]\Big)\Big\}$

```
cumret = Table[Exp[Total[Take[preturns, i]]], {i, Length[preturns]}] - 1;
(*could do this faster incrementally, but this is fast enough*)

pcumplot = DateListPlot[Transpose[{Drop[dates, 1], cumret}],
  Joined → True, Axes → True, PlotStyle → Green]
```



```
(*now, pick a benchmark, get the returns, plot.  Calculate alpha & beta,...*)
```

```
worldstocks = {{"VT", 1}};
worldbonds = {{"PZA", 110}, {"SHY", 25}, {"IEF", 22}, {"TLT", 22}, {"MBB", 100},
    {"LQD", 50}, {"JNK", 32}, {"AGZ", 30}, {"USY", 150}, {"PCY", 350}, {"BWX", 100}};
  (*no int'l corp or us asset-backed etfs*)
worldother = {{"DJP", 1}};
```

$$
\text{libor} = 0; \ \text{dlibor} = \sqrt[365.25]{\left(1 + \frac{\text{libor}}{100}\right)} - 1;
$$

```
quotesfn[symbols_, startdate_] :=
   Table[FinancialData[symbols[[i, 1]], startdate][[All, 2]], {i, Length[symbols]}];
returnsfn[values_] := Table[Log[values[[i, j]] / values[[i, j - 1]]] - dlibor,
    {i, Length[values]}, {j, 2, Length[values[[1]]]}];
returns1fn[values_] := Table[Log[values[[j]] / values[[j - 1]]] - dlibor,
    {j, 2, Length[values]}];

worldsquotes = quotesfn[worldstocks, {startdate, enddate}];
worldbquotes = quotesfn[worldbonds, {startdate, enddate}];
worldoquotes = quotesfn[worldother, {startdate, enddate}];
worldsvals = worldsquotes * worldstocks[[All, 2]];
worldbvals = worldbquotes * worldbonds[[All, 2]];
worldovals = worldoquotes * worldother[[All, 2]];
(*worldsreturns=returns[worldsvals];
worldbreturns=returns[worldbvals];
worldoreturns=returns[worldovals];*)
worldsportvals = Total[worldsvals];
worldbportvals = Total[worldbvals];
worldoportvals = Total[worldovals];
worldsportreturns = returns1fn[worldsportvals];
worldbportreturns = returns1fn[worldbportvals];
worldoportreturns = returns1fn[worldoportvals];
worldreturns =
   .55 worldsportreturns + .4 worldbportreturns + .05 worldoportreturns;

cumwret = Table[Exp[Total[Take[worldreturns, i]]], {i, Length[worldreturns]}] - 1;

wcumplot = DateListPlot[Transpose[{Drop[dates, 1], cumwret}],
    Joined → True, Axes → True, PlotStyle → Black];
```
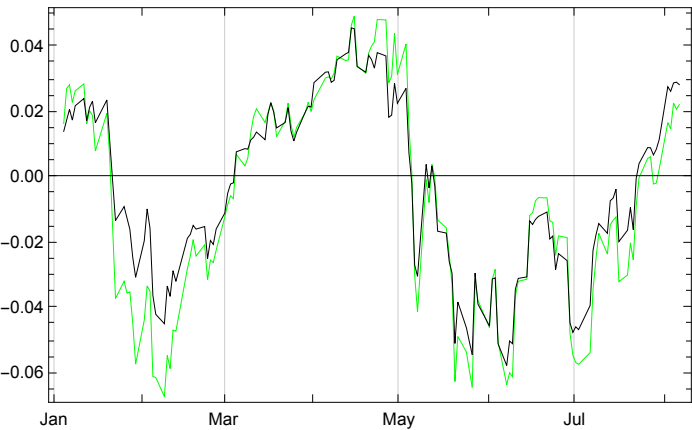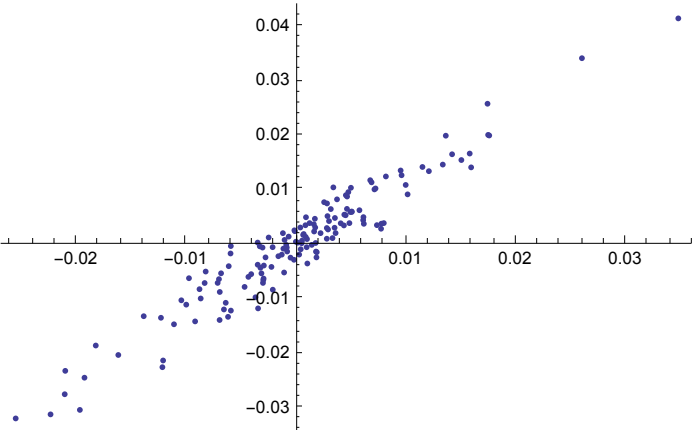
Show[pcumplot, wcumplot, PlotRange → All]

ListPlot[Transpose[{worldreturns, preturns}]]

Needs["LinearRegression`"]

r = Regress[Transpose[{worldreturns, preturns}], y, y]

		Estimate	SE	TStat	PValue
{ParameterTable →	1	−0.0000803419	0.000252677	−0.317962	0.750962,
	y	1.21679	0.028933	42.0554	0.

RSquared → 0.922782, AdjustedRSquared → 0.922261, EstimatedVariance → 9.57246×10^{-6},

|		DF	SumOfSq	MeanSq	FRatio	PValue
ANOVATable →	Model	1	0.0169304	0.0169304	1768.66	0. }
	Error	148	0.00141672	9.57246×10^{-6}		
	Total	149	0.0183471			

beta = r[[1, 2, 1, 2, 1]]

1.21679

**annworldret = Exp[Total[worldreturns]] − 1**

0.0285547

```
jensen =
 annportret - ( libor + beta * ( annworldret - libor ) ) (*Returns are already excess*)
```

-0.0122897

```
wrplot = DateListPlot[Transpose[{Drop[dates, 1], worldreturns}],
    PlotRange -> All, Axes → True, PlotStyle → Black];
Show[prplot, wrplot, PlotRange → All]
```
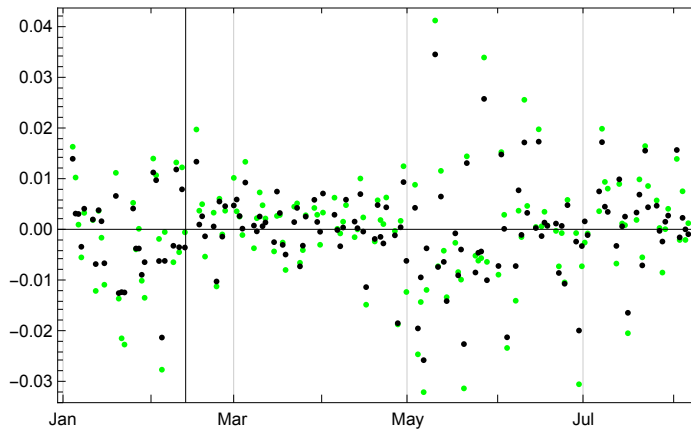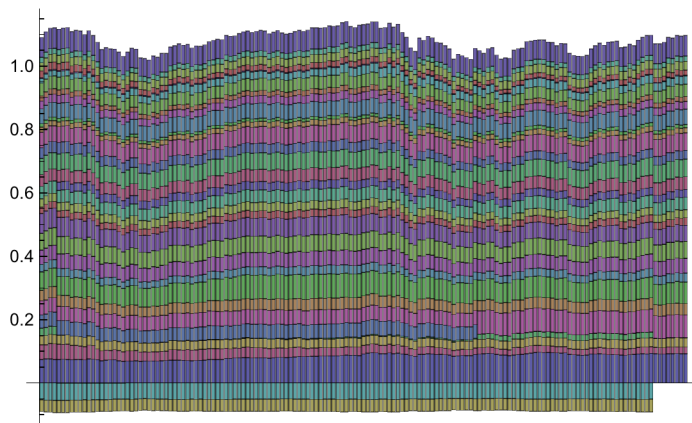


```
Needs["StatisticalPlots`"];
```

```
BoxWhiskerPlot[worldreturns, preturns, BoxOutliers → True,
 Axes → True, BoxLabels → {"world returns", "portfolio returns"}]
```
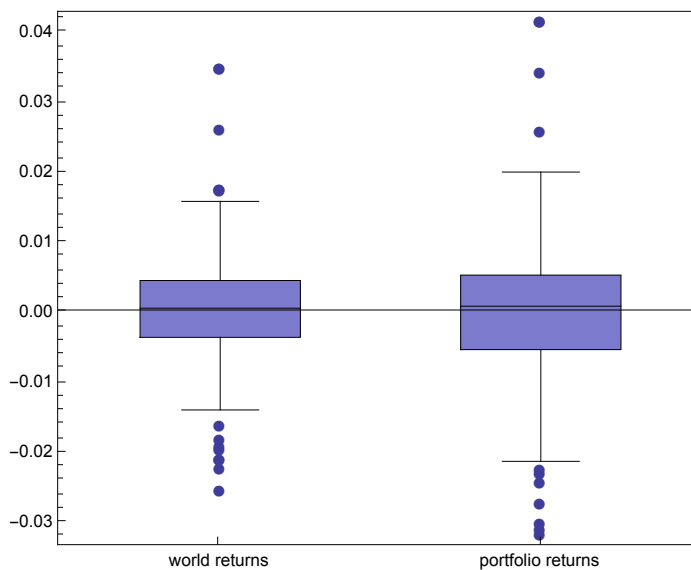
StackedBarChart[Transpose[positions quotes / pval[[1]]], BarLabels → None]

PercentileBarChart[Transpose[positions quotes]]