# RECITATION
## Simple Linear Regression

First:
Collect homework due today.
Hand out homework solutions.
Review one or more homework problems, as needed.

Then:
Explain difficult concepts from the lecture.

You may wish to go over some regression w/ MS Excel problems in:
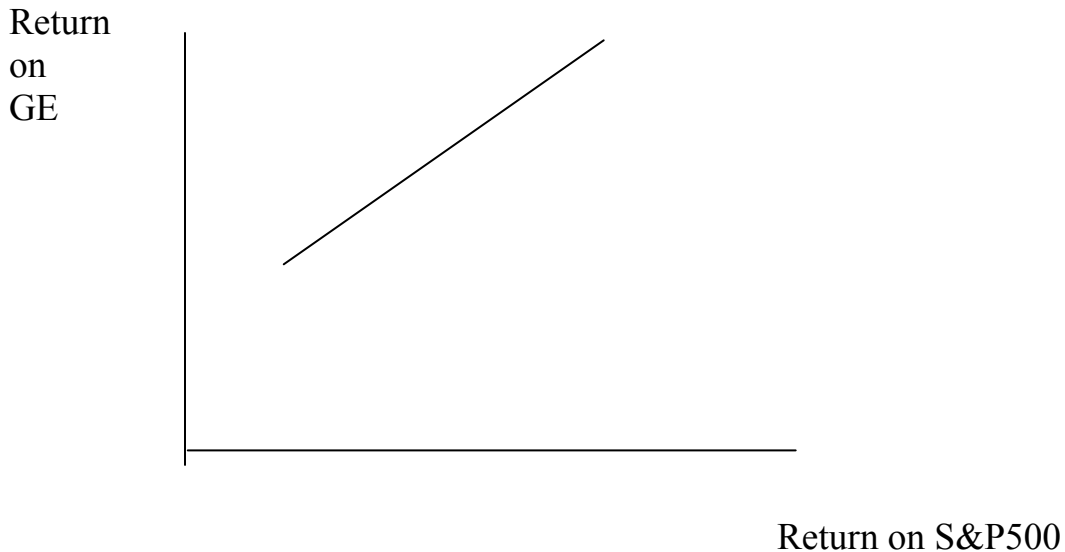http://cisnet.baruch.cuny.edu/friedman/stat/n_regressionxlsprobs.doc

Measuring a Stock's Beta:

Dependent variable:  Quarterly returns on a specific stock, say GE.
Independent variable:  Quarterly returns on the S&P500 which is a
surrogate for the entire stock market.

[Return = difference in Price + Dividend]

Return
on
GE

Return on S&P500

$\hat{Y} = b_0 + b_1 X$

$b_1$ = the slope of the line = the beta of the stock

if the beta = 1, GE is just as volatile as the S&P500
if the beta = 2, GE is 2 times as volatile as the S&P500

We have two rates of change and $\dfrac{\Delta GE}{\Delta S \& P}$.  Do they change together (say,
beta of 1.0) or differently?

|  | Returns Stock ABC |  | Returns S&P 500 |  |  |  |  |
|---|---|---|---|---|---|---|---|
| Year 1 | 11% |  | 20% |  |  |  |  |
| Year 2 | 6% |  | 18% |  |  |  |  |
| Year 3 | -8% |  | -14% |  |  |  |  |
| Year 4 | 12% |  | 18% |  |  |  |  |
| Year 5 | 7% |  | 13% |  |  |  |  |
| Year 6 | 8% |  | 12% |  |  |  |  |
| Year 7 | -10% |  | -20% |  |  |  |  |
| Year 8 | 9% |  | 14% |  |  |  |  |
| Year 9 | 6% |  | 13% |  |  |  |  |
| Year 10 | -8% |  | -17% |  |  |  |  |
| Year 11 | 4% |  | 4% |  |  |  |  |
| Year 12 | 11% |  | 14% |  |  |  |  |
| Average Return | **4.00%** |  | **6.25%** |  |  |  |  |

SUMMARY OUTPUT

| Regression Statistics | |
|---|---|
| Multiple R | 0.973281463 |
| R Square | 0.947276806 |
| Adjusted R Square | 0.942004487 |
| Standard Error | 0.019265806 |
| Observations | 12 |

ANOVA

|  | df | SS | MS | F | Significance F |
|---|---|---|---|---|---|
| Regression | 1 | 0.066688287 | 0.066688287 | 179.66984 | 1.02536E-07 |
| Residual | 10 | 0.003711713 | 0.000371171 |  |  |
| Total | 11 | 0.0704 |  |  |  |

|  | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% |
|---|---|---|---|---|---|---|
| Intercept | 0.006735691 | 0.006090118 | 1.106003315 | 0.2946222 | -0.00683394 | 0.020305322 |
| X Variable 1 | 0.532228948 | 0.039706435 | 13.40409804 | 1.025E-07 | 0.443757482 | 0.620700413 |

beta of stock ABC is .53