Formula Sheet for Econ 367 Midterm 1

- $APR = n*\{[1+EAR]^{1/n} - 1\}$
- Compounding. V(0) today is worth $V(n) = V(0)*\exp(rn)$ in n periods. Hence $r = \frac{\ln(V(n)) - \ln(V(0))}{n}$
- Present Value: $P = \frac{C(1)}{1+r} + \frac{C(2)}{(1+r)^2} \ldots + \frac{C(T)}{(1+r)^T}$
- Suppose that $X_1, X_2, \ldots X_n$ are random variables and $k_1, k_2, \ldots k_n$ are constants. Then $E(\Sigma k_j X_j) = \Sigma k_j E(X_j)$ and $Var(\Sigma k_j X_j) = \Sigma_{i=1}^{n} \Sigma_{j=1}^{n} k_i k_j Cov(X_i, X_j)$
- Minimum Variance Portfolio weights (2 assets): $w_D = \frac{\sigma_E^2 - Cov(R_D, R_E)}{\sigma_E^2 + \sigma_D^2 - 2Cov(R_D, R_E)}$ and $w_E = 1 - w_D$
- Maximum Sharpe Ratio Portfolio weights (2 assets): $w_D = \frac{E(R_D)\sigma_E^2 - E(R_E)Cov(R_D, R_E)}{E(R_D)\sigma_E^2 + E(R_E)\sigma_D^2 - [E(R_D) + E(R_E)]Cov(R_D, R_E)}$

and $w_E = 1 - w_D$ where R_D and R_E are excess returns over the riskfree rate