

QUESTION 1

- (a) The mean of the portfolio return is **4.05%**
- (b) The standard deviation of the portfolio is **3.67%**
- (c) The sharp ratio of the portfolio is **0.7**
- (d) The portfolio weight that maximize the Sharpe Ratio is:

Asset A	Asset B	Asset C
45%	50%	5%

- (e) The portfolio weight that set the mean portfolio return to be 11.3% is:

Asset A	Asset B	Asset C
84%	50%	-34%

QUESTION 2

(a) The mean monthly returns of the ASX200 index is **0.34%**.

(b) The standard deviation of the ASX200 monthly return is **0.036**.

(c) The formula in the cells of the array F9:Q1008:

=NORM.INV(RAND(),\$C\$4,\$C\$5) +1 (This applied for all cells)

(d) Formula in cell K2 that computes the proportion of those values that are above 8500 is:

=COUNTIF(R9:R1008,">8500")/(COUNT(R9:R1008))

(e) One main limitation of my Monte Carlo simulation is that it uses the random selection of occurrences. Hence, it is just the statistic estimation of the potential results, not the exact number.

QUESTION 3

(a) Column H, the monthly returns of a portfolio that is equally weighted on the five risky assets are from

=AVERAGE(B4:F4)

till

=AVERAGE(B129:F129)

(b) Column K, the monthly excess returns of the above portfolio are from

=H4-J4 till =AH129-J129

(c) Column L, the monthly excess returns of the market index are from

=I4-J4 till =I129-J129

(d)

d								
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.351714844							
R Square	0.123703331							
Adjusted R Square	0.116636423							
Standard Error	0.044414558							
Observations	126							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	0.034530479	0.034530479	17.50458906	5.38047E-05			
Residual	124	0.244608965	0.001972653					
Total	125	0.279139445						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.001082033	0.004188483	-0.258335294	0.796576445	-0.009372213	0.007208147	-0.009372213	0.007208147
% Change in COVID Cases	-0.060334833	0.014420893	-4.183848595	5.38047E-05	-0.08887782	-0.031791846	-0.08887782	-0.031791846

(e)

e								
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.868974161							
R Square	0.755116092							
Adjusted R Square	0.75113424							
Standard Error	0.023574266							
Observations	126							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	2	0.210782687	0.105391343	189.6394095	2.63667E-38			
Residual	123	0.068356758	0.000555746					
Total	125	0.279139445						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.000605161	0.002225172	0.271961637	0.786107491	-0.00379943	0.005009752	-0.00379943	0.005009752
Excess Returns Market	1.41263444	0.079323283	17.80857254	7.48075E-36	1.255618865	1.569650015	1.255618865	1.569650015
% Change in COVID Cases	-0.011279106	0.008134867	-1.386513804	0.16809806	-0.027381577	0.004823365	-0.027381577	0.004823365

(f) The RMSE of the model in part (d) = **4.43%**.

(g) The RMSE of the model in part (e) = **2.43%**.