1. A)

Table 1			
Year	Project 1 cash flow ($)	Discount Factor @ 7%	Discounted Cash Flow
0	-100,000	1.0000	-100,000
1	10,000	0.9346	9,345.7944
2	10,000	0.8734	8,734.3873
3	10,000	0.8163	8,162.9788
4	20,000	0.7629	15,257.9042
5	100,000	0.7130	71,298.6179
Net Profit	50,000		NPV = 12,799.6826

Table 2			
Year	Project 2 cash flow ($)	Discount Factor @ 7%	Discounted Cash Flow
0	-100,000	1.0000	-100,000
1	30,000	0.9346	28,037.3832
2	30,000	0.8734	26,203.1618
3	30,000	0.8163	24,488.9363
4	30,000	0.7629	22,886.8564
5	30,000	0.7130	21,389.5854
Net Profit	50,000		NPV = 23,005.9231

b)   Project 1: NPV = $12,799.68   Payback Period: 4.5 years

Project 2: NPV = $23,005.92   Payback Period: 3.33 years

c)   ROI for both projects are 10%.

d)   The ROI are the same for both projects so that won't influence our decision. Project 2 has a higher NPV and a shorter payback period than Project 1, so I will pick Project 2 for both factors.

2.

a.

Equipment	P_1	P_2	P_3	Average Payoff
C_1	70	80	90	(70 + 80 + 90) / 3 = 80
C_2	100	20	120	(100 + 20 + 120) / 3 = 80
C_3	100	90	60	(100 + 90 + 60) / 3 = 83.33
C_4	30	30	140	(30 + 30 + 140) / 3 = 66.67

Equipment C_3 would be purchased because it has the highest average payoff

b.

Equipment	P_1	P_2	P_3	Worst Payoff
C_1	70	80	90	70
C_2	100	20	120	20
C_3	100	90	60	60
C_4	30	30	140	30

Equipment C_1 would be purchased because it has the highest worst payoff

c.

Equipment	P_1	P_2	P_3	Best Payoff
C_1	70	80	90	90
C_2	100	20	120	120
C_3	100	90	60	100
C_4	30	30	140	140

Equipment C_4 would be purchased because it has the highest best payoff

d.

Equipment	Best Payoff	Worst Payoff	$\alpha = 0.2$	Blended Payoff
C_1	90	70	(0.2 * 90) + (0.8 * 70)	74
C_2	120	20	(0.2 * 120) + (0.8 * 20)	40
C_3	100	60	(0.2 * 100) + (0.8 * 60)	68
C_4	140	30	(0.2 * 140) + (0.8 * 30)	52

Equipment C_1 would be purchased because it has the highest blended payoff

e.

Equipment	P_1	P_2	P_3	Maximum Regret
C_1	100 – 70 = 30	90 – 80 = 10	140 – 90 = 50	50
C_2	100 – 100 = 0	90 – 20 = 70	140 – 120 = 20	70
C_3	100 – 100 = 0	90 – 90 = 0	140 – 60 = 80	80
C_4	100 – 30 = 70	90 – 30 = 60	140 – 140 = 0	70

Equipment C_1 would be purchased because it has the lowest maximum regret

3.

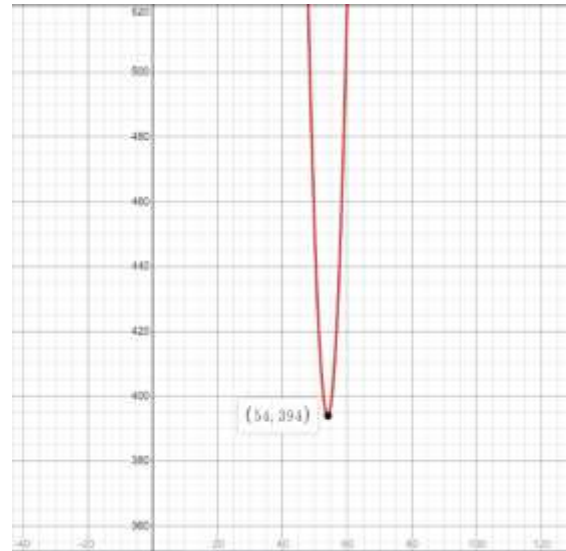| Optimum Points		
Routine	Execution Time (ms)	Number of Records
1	912	40
2	394	54
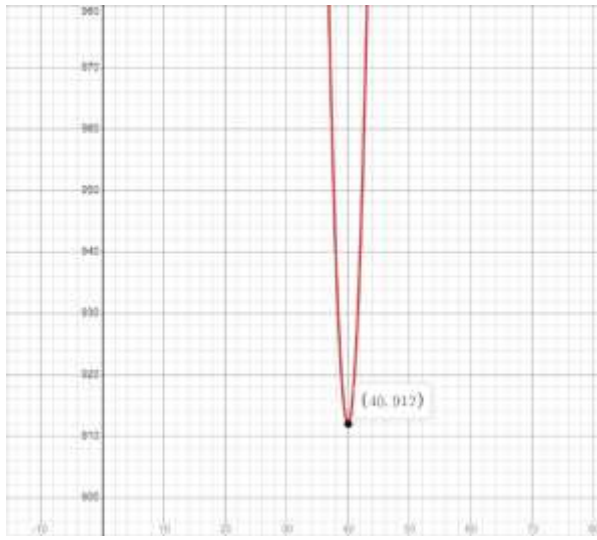
Routine 1:   Routine 2:

Based on the optimum points plotted on the graph, Routine 2 has a faster execution time and a larger input stream. Therefore, Routine 2 should be selected and the size of the input stream should be 54 records.