Module 04 – Multiperiod Modeling

Exploratory Data Analysis

In this section, you should perform some data analysis on the data provided to you. Please format your findings in a visually pleasing way and please be sure to include these cuts:
- *Make a nicely formatted table with the needed data on each investment*

Investment	Return	Inflow	Outflow
CandyCorn Capital Partners	1.99%	1	1
Peppermint Profit Partners	4.22%	1	2
RockCandy Returns	6.44%	2	3
Toffee Turnaround Trust	8.68%	3	4
TruffleTrust Holdings	10.93%	1	5

Model Formulation

Write the formulation of the model into here prior to implementing it in your Excel model. Be explicit with the definition of the decision variables, objective function, and constraints

CandyCorn Capital Partners	A
Peppermint Profit Partners	B
RockCandy Returns	C
Toffee Turnaround Trust	D
TruffleTrust Holdings	E

Min: $A_1 + B_1 + C_2 + D_3 + E_1$

A_i: amount (in $1,000s) placed in CandyCorn Capital Partners (A) at the beginning of month $i = 1, 2, \ldots, 9$

B_i: amount (in $1,000s) placed in Peppermint Profit Partners (B) at beginning of month $i = 1, 3, 5, 7$

C_i: amount (in $1,000s) placed in RockCandy Returns (C) at beginning of month $i = 2, 5$

D_3: amount (in $1,000s) placed in Toffee Turnaround Trust (D) at beginning of month 3

E_1: amount (in $1,000s) placed in TruffleTrust Holdings (E) at beginning of month 1

Model Optimized for Least Cost out of Pocket

Constraints – Starting month 2

M2: $1.0199A_1 - A_2 - C_2 = 0$

M3: $1.0422B_1 + 1.0199A_2 - A_3 - B_3 - D_3 = 250$

M4: $1.0199A_3 - A_4 = 0$

M5: $1.0644C_2 + 1.0422B_3 + 1.0199A_4 - A_5 - B_5 - C_5 = 0$

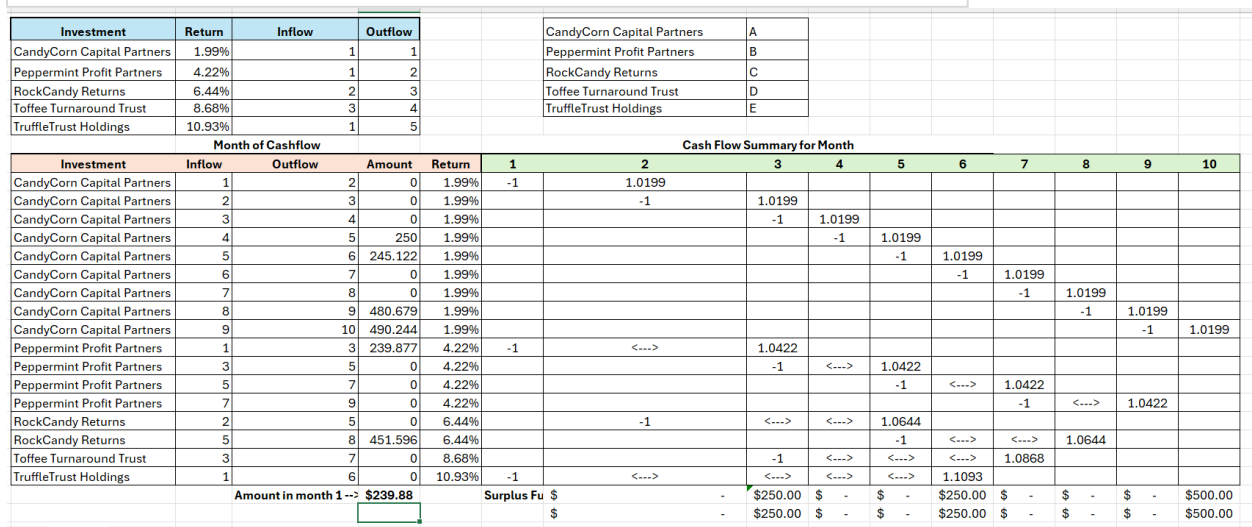M6: $1.1093E_1 + 1.0199A_5 - A_6 = 250$

M7: $1.0868D_3 + 1.0422B_5 + 1.0199A_6 - A_7 - B_7 = 0$

M8: $1.0644C_5 + 1.0199A_7 - A_8 = 0$

M9: $1.0422B_7 + 1.0199A_8 - A_9 = 0$

M10: $1.0199A_9 = 500$

Implement your formulation into Excel and be sure to make it neat. This section should include:

- *A screenshot of your optimized final model (formatted nicely, of course)*
- *A text explanation of what your model is recommending*
- *Add some sort of visualization. Some ideas:*
  - *A pie chart or stacked bar chart to compare money out of pocket vs end amount*
  - *A line chart to show either current amount or cumulative amount invested in each investment*
  - *Any other solution you may have*

Chart Title — legend: Out-of-Pocket Investment, Return/Profit

Investment	Return	Inflow	Outflow
CandyCorn Capital Partners	1.99%	1	1
Peppermint Profit Partners	4.22%	1	2
RockCandy Returns	6.44%	2	3
Toffee Turnaround Trust	8.68%	3	4
TruffleTrust Holdings	10.93%	1	5

CandyCorn Capital Partners	A
Peppermint Profit Partners	B
RockCandy Returns	C
Toffee Turnaround Trust	D
TruffleTrust Holdings	E

Investment	Inflow	Outflow	Amount	Return	1	2	3	4	5	6	7	8	9	10
CandyCorn Capital Partners	1	2	0	1.99%	-1	1.0199								
CandyCorn Capital Partners	2	3	0	1.99%		-1	1.0199							
CandyCorn Capital Partners	3	4	0	1.99%			-1	1.0199						
CandyCorn Capital Partners	4	5	250	1.99%				-1	1.0199					
CandyCorn Capital Partners	5	6	245.122	1.99%					-1	1.0199				
CandyCorn Capital Partners	6	7	0	1.99%						-1	1.0199			
CandyCorn Capital Partners	7	8	0	1.99%							-1	1.0199		
CandyCorn Capital Partners	8	9	480.679	1.99%								-1	1.0199	
CandyCorn Capital Partners	9	10	490.244	1.99%									-1	1.0199
Peppermint Profit Partners	1	3	239.877	4.22%	-1	<--->	1.0422							
Peppermint Profit Partners	3	5	0	4.22%			-1	<--->	1.0422					
Peppermint Profit Partners	5	7	0	4.22%					-1	<--->	1.0422			
Peppermint Profit Partners	7	9	0	4.22%							-1	<--->	1.0422	
RockCandy Returns	2	5	0	6.44%		-1	<--->	<--->	1.0644					
RockCandy Returns	5	8	451.596	6.44%					-1	<--->	<--->	1.0644		
Toffee Turnaround Trust	3	7	0	8.68%			-1	<--->	<--->	<--->	1.0868			
TruffleTrust Holdings	1	6	0	10.93%	-1	<--->	<--->	<--->	<--->	1.1093				
Amount in month 1 --> $239.88	Surplus Fu	$ -		$250.00	$ -	$ -	$250.00	$ -	$ -	$ -	$500.00			
		$ -		$250.00	$ -	$ -	$250.00	$ -	$ -	$ -	$500.00			

(Section labels shown in sheet: "Month of Cashflow" and "Cash Flow Summary for Month")

Model with Stipulation

Please copy the tab of your original model before continuing with the next part to avoid messing up your original solution.

Try one of these 2 scenarios:

- *If we remove the midterm payments and instead pay the entirety at the end of the time period, does your model change at all? If so, why may there be a change?*
- *An investor normally tries to not be oversubscribed/overexposed to one single investment. Can you add a constraint to your model to limit the amount of exposure in any single investment and describe how the model has changed?*

I made a copy of the original model to protect your first solution, and then I added a new diversity restriction to represent a more practical approach to investing. This restriction avoids overexposure to any one asset by capping any one investment at no more than 50% of the initial investment amount. Therefore, instead of focusing only on the best choice, the model is forced to allocate investment among all of the options. In the end, this diversification fits with the investor's goal of reducing risk while still generating the necessary future income flows, even though it somewhat raises the overall out-of-pocket investment.