

IE 342 18-19 Spring Semester

Study Set 3

Please note that we will not send the solution key! But you can ask your questions in the office hour.

1) A production facility is planning to buy a enterprise resource planning software. The implementation and training costs will result a total of \$120.000 at the end of first year. Following year it will generate a profit of \$45.000, and continuing \$50.000, \$55.000, \$60.000 respectively. If MARR=15% . What is the net present worth of this 5 year project

2) A new bus terminal will have a construction cost of \$200.000. The terminal will need a renovation every 10 years at a cost of \$50.000. Annual maintenance costs will be \$15.000. The is considered as MARR=%9.

a) What is the capitalized cost of the bus terminal?

b) Because of bad weather conditions the terminal will need a renovation every 8 year. What would be the capitalized cost in that case

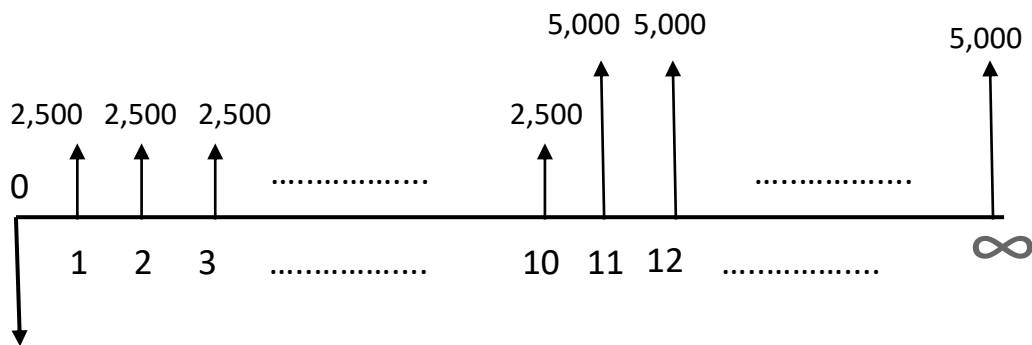
c)How would the results change if MARR=%15, how does the rate affect the results?

3) Consider the following cash flow: Zeynep earns \$1,000 in year 1, \$1,100 in year 2, \$1,200 in year 3, \$1,300 in year 4, and the same pattern continues up to infinity. (\$1,000 in year 5, \$1,100 in year 6, \$1,200 in year 7,..). What is the present worth of this cash flow under MARR 10%?

4) Consider the following projects whose cash flows are given in the table below. Compute the future worth of each project at the end of 5 years under MARR=11%.

Project's Cash Flow (in \$)			
Year	A	B	C
0	-2,000	-4,100	-7,200
1	-800	1,500	2,500
2	900	-3,000	0
3	1,500	5,000	8,000
4	3,200	5,000	0
5	-500	-3,050	0

5) Given that $i = 13\%$ and payment period is infinite, find the present worth value of following cash flow.



6) Consider the following cash flows:

Projects' Cash Flows

n	A	B	C
0	-\$4,200	-\$10,000	-\$6,000
1	\$800	\$2,000	\$1,700
2	\$800	\$3,500	\$1,700
3	\$800	\$2,500	\$1,700
4	\$800	\$2,500	\$1,700
5	\$800	\$2,500	\$1,200
6	\$800	\$2,000	\$1,200
7	\$800		\$1,200
8	\$800		

- Calculate the (conventional) payback period for each project.
- Calculate the discounted payback period for each project assuming $i = 10\%$

7) A third wave coffee shop considers replacing their old coffee machine with a new one due to its high maintenance costs. The new coffee machine costs \$30,000 including the installation cost and it will require maintenance and repair every 2 years at a cost of \$6,000. In addition, an expenditure of \$8,000 will need to be made at the end of the third year for a caffeine extraction mechanism for the customers who prefer decaf coffee which will not be available until then. Annual operating costs are expected to be around \$1,000 for the first 5 years and \$1,500 thereafter. Compute the capitalized equivalent assuming $i=5\%$.

8) A newly constructed bridge costs \$3,000,000. The same bridge is estimated to need renovation every 10 years at a cost of \$500,000. Annual repairs and maintenance are expected to cost \$100,000 in a year.

- a) Determine the capitalized cost of the bridge assuming $i=7\%$.
- b) Suppose that the bridge turns out to be requiring renovation every 8 years, not every 10 years. What is the capitalized cost of the bridge?

9) Consider the investment projects below, all of which have a four-year investment life:

n	A	B	C	D
0	-\$2500	-\$100	-\$1800	-\$2000
1	\$100	0	\$200	\$400
2	\$100	0	\$1200	\$500
3	-\$100	\$200	-\$1300	\$600
4	\$50	\$100	0	\$700

Compute the net present worth of each project at $i=10\%$