



Software Project Management KOE-068

Tutorial-01

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Tutorial (Unit-1)

Ques-1. Say that you can either receive \$3200 today and invest it at a rate of 4% or take a lump sum of \$3500 in a year. Calculate the P.V. of \$3500 can help you make a choice.

Sol-1 To calculate the present value (PV) of \$3500 to compare it with receiving \$3200 today at 4% interest rate.

$$P.V. = \frac{F.V. \text{ (Future value)}}{(1+r)^n}$$

where P.V. - Present value

F.V. - Future value (\$3500 in this case)

r = Interest rate (4% or 0.04)

n = Number of periods. (1 year in this case)

Substituting the values we get

$$P.V. = \frac{3500}{(1+0.04)^1} = \frac{3500}{1.04} \approx 3365.38$$

$$P.V. \text{ calculated} = 3365.38 > \$3200.$$

∴ It's more beneficial to take the \$3500 in an year rather than the \$3200 today and invest it at 4% per annum.

Ques-2 One of your friends needs \$500 and promised to pay you back \$570 in a year. Is that a fruitful investment when you can invest at 10% elsewhere? Let's calculate (FV) of \$500 after one year.

$$\begin{aligned} F.V. &= P.V. \times (1+r)^n \\ &= 500 \times (1+0.10)^1 = 500 \times 1.1 = 550 \end{aligned}$$

$$\therefore F.V. \text{ calculated is } \$550 < \$570$$

To receive \$570 in return of \$500 is a fruitful investment.

Ques-3 Suppose a project requires an initial investment of \$2000 and it is expected to generate a cash flow of \$100 for 3 years plus \$12500 in the third year. The target rate of return of the project is 10% per annum. Calculate the net present value of the Project.
for the cash flows of \$100 for 3 years.

$$P.V. = \frac{C.F.}{(1+r)^n}$$

C.F. - Cash Flow (\$100)

r - rate of interest (10%)

n - number of periods (1 year in this case)

$$\begin{aligned} P.V._{100} &= \frac{100}{(1+0.10)^1} + \frac{100}{(1+0.10)^2} + \frac{100}{(1+0.10)^3} \\ &= \frac{100}{1.10} + \frac{100}{(1.10)^2} + \frac{100}{(1.10)^3} \end{aligned}$$

$$\begin{aligned} P.V._{(100)} &\approx \frac{100}{1.10} + \frac{100}{1.21} + \frac{100}{1.331} \\ &\approx 90.91 + 82.64 + 74.40 \approx 247.95 \end{aligned}$$

$$P.V._{100} \approx 247.95$$

$$P.V._{(12500)} = \frac{12500}{(1+0.10)^3} = \frac{12500}{1.331} \approx 9379.33$$

$$P.V._{(12500)} \approx 9379.33$$

$$\text{Total P.V.} = P.V._{(100)} + P.V._{(12500)} = 247.95 + 9379.33$$

$$P.V. = 9627.28$$

$$\begin{aligned} N.P.V. &= \text{Total P.V.} - \text{Initial Investment} \\ &= 9627.28 - 2000 = 7627.28 \end{aligned}$$

$$N.P.V. = 7627.28$$

Ques-4) Assume that ABC Inc is considering two projects namely Project X and Project Y and want to calculate NPV for each project. Both project X and project Y is four year project and cash flows of both the projects for four years are given below.

Year	Project X Cash Flows	Project Y cash Flows
1.	\$ 5000	\$ 1000
2.	\$ 4000	\$ 3000
3.	\$ 3000	\$ 4000
4.	\$ 1000	\$ 6750
	$\Sigma X = \$13000$	$\Sigma Y = \$14750$

The firm's cost of capital is 10% for each project and the initial investment amount is \$10000. Calculate the NPV of each project and determine in project the firm should invest.

Sol.-4) Initial Investment amount = \$10,000
Cost of capital (discount rate) = 10%.

For Project X $NPV = \sum_{t=1}^4 \frac{CF_x}{(1+r)^t} - \text{Initial investment}$

$$NPV(x) = \frac{5000}{(1+0.1)^1} + \frac{4000}{(1+0.1)^2} + \frac{3000}{(1+0.1)^3} + \frac{1000}{(1+0.1)^4} - 10000$$

$$NPV(x) \approx 6793.06$$

For Project Y $NPV(Y) = \sum_{t=1}^4 \frac{CF_Y}{(1+r)^t} - \text{Initial Investment}$

$$NPV(Y) = \frac{1000}{(1+0.1)^1} + \frac{3000}{(1+0.1)^2} + \frac{4000}{(1+0.1)^3} + \frac{6750}{(1+0.1)^4} - 10000$$

$$NPV(Y) \approx 8826.58$$

\therefore Project Y has higher NPV than Project X. The firm should invest in project Y.

Ques-5 Calculate Return on Investment

Calculations & Results	Option 1	Option 2	Option 3
Total Investment	19000	115000	18000
Total net returns	7000	7500	6000

$$R.O.I. (\text{option 1}) = \frac{\text{Total Net Returns}}{\text{Total Investment}} \times 100$$

$$R.O.I. \text{ Option 1} = \frac{7000}{19000} \times 100 = 36.84\%$$

$$R.O.I. \text{ Option 2} = \frac{7500}{115000} \times 100 = 6.52\%$$

$$R.O.I. \text{ option 3} = \frac{6000}{18000} = 33.33\%$$

Based on R.O.I. calculations, Option 1 has the highest return on Investment at 36.84%. \therefore Option 1 seems to be the most favourable.

Ques-1) Define machine Learning. Explain the types of machine Learning with examples.

Machine Learning is a subset of A.I.

Definition: According to Tom Mitchell a computer program is said to learn from experience E , with respect to some class of Task T and performance measure P , if its performance at tasks in T as measured by P , improves with experience E .