

Scilab Manual for
Finance calculations
by Prof K.sreenivasa Charyulu
Others
Sreenidhi Institute Of Science And
Technology¹

Solutions provided by
Mr Katkam Ashutosh
Electronics Engineering
Sreenidhi Institute Of Science And Technology

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Experiment: 1

Depreciation Accounting using straight line method

Scilab code Solution 1.0 Depreciation

```
1 //Depreciation accounting using Straight line method
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept Information
8 //Formula
9 //Depreciation=(Cost of the Asset + Installation
    charges- Scrap value)/(Total life of asset)
10 //Rate of Depreciation =(Annual Depreciation/Orginal
    cost of asset)*100;
11 //Inputs to be given are cost of asset; Installation
    charges; Scrap Value ; Total life of the asset
12 C.O.A = input('Enter the cost of asset :');//in
    rupees
13 I.C = input('Enter the Installation charges :');//in
    rupees
14 S.V = input('Enter the scrap value :');//in rupees
```

```

15 T.L=input('Enter the Total life of the asset :')//in
    years
16 depreciation=(C.O.A+I.C-S.V)/T.L;
17 printf("Depreciation per annum in rupees equal to :")
    );
18 disp(depreciation);
19 R.O.D=(depreciation/C.O.A)*100;
20 printf("Rate of Depreciation in percentage :");
21 disp(R.O.D);
22 t=0:1:T.L;
23 //plotting depreciation curve over life time
24 plot2d(t,C.O.A-(depreciation*t));
25 //cost of asset after given years=Initial cost of
    asset-(depreciation per year)*Number of years
26 title('Cost of asset over total life time');//title
    of the graph
27 xlabel('Number of years');//X-axis label
28 ylabel('Cost');//Y-axis label
29 //Output
30 //Enter the cost of asset :500000 (Input Cost of
    asset according to problem)
31 //Enter the Installation charges :50000 (Input
    Installation cost according to problem)
32 //Enter the scrap value :150000 (Input Scrap value
    according to problem)
33 //Enter the Total life of the asset :10 (Input Total
    life time of the asset accrding to the problem)
34 //Depreciation per annum in rupees equal to :
35 // 40000.
36 //Rate of Depreciation in percentage :
37 // 8.

```

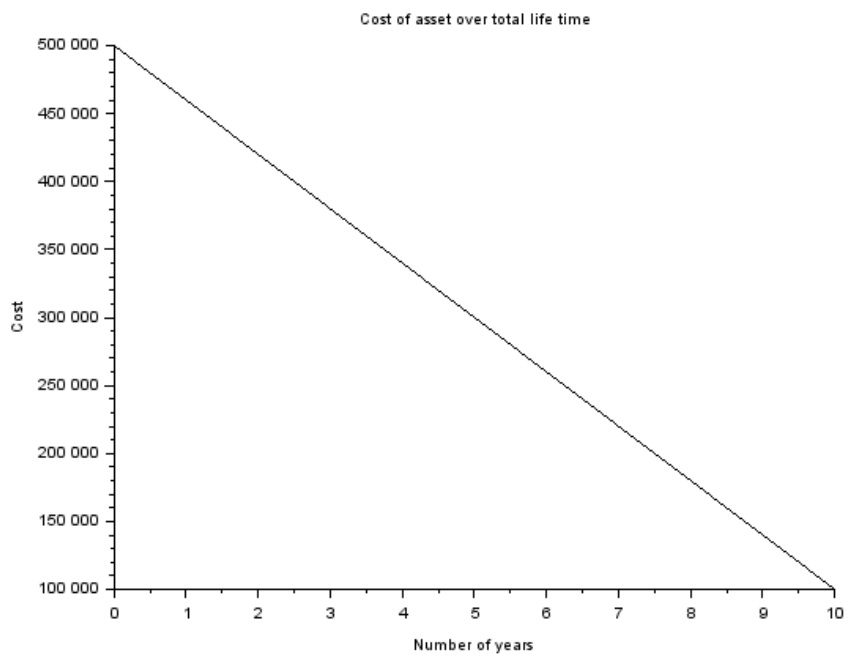


Figure 1.1: Depreciation

Experiment: 2

Risk calculation using Debt ratio

Scilab code Solution 2.0 Risk calculation

```
1 //Risk calculation using debt ratio
2 //Comparing two companies based on risk
3 //OS :Windows 10
4 //Scilab 6.1.0
5 clear;
6 clc;
7 close;
8 //Concept Information
9 //Formula
10 //Debt Ratio = (current liabilities + long-term
    liabilities) / (current assets + long-term
    assets)
11 //Debt Equity Ratio = (current liabilities + long-
    term liabilities) / equity
12 //Times Interest Earned Ratio (TIER) = (net income +
    interest + taxes) / taxes
13 //Inputs to be given are Current Liabilities;Long-
    term Liabilities;Current Assets;Long-term Assets;
    Equity;Net Income;Interest;Taxes
```

```

14 cla = input('Enter the current liabilities of the
    company a: ');
15 ltla =input('Enter the Long term liabilities of the
    company a: ');
16 caa =input('Enter the Current assests of the company
    a: ');
17 ltaa =input('Enter the Long-term assets of the
    company a: ');
18 ea =input('Enter the Equity of the company a: ');
19 nia =input('Enter the Net income of the company a: '
    );
20 ia =input('Enter the Interest amount of the company
    a: ');
21 ta =input('Enter the Taxes of the company a: ');
22 //Enter all inputs in the rupees only
23 DRa =((cla+ltla)/(caa+ltaa));//Debt ratio
24 DERa =(cla+ltla)/ea;
25 tiera =(nia+ia+ta)/ta;
26 printf("\n Debt Ratio of company a= ")
27 disp(DRa);
28 printf("\n Debt Equity Ratio of company a = ")
29 disp(DERa);
30 printf("\n Times Interest Earned Ratio of company a"
    );
31 disp(tiera);
32 clb =input('Enter the current liabilities of the
    company b: ');
33 ltlb =input('Enter the Long term liabilities of the
    company b: ');
34 cab =input('Enter the Current assests of the company
    b: ');
35 ltab =input('Enter the Long-term assets of the
    company b: ');
36 eb =input('Enter the Equity of the company b: ');
37 nib =input('Enter the Net income of the company b: '
    );
38 ib =input('Enter the Interest amount of the company
    b: ');

```

```

39 tb =input('Enter the Taxes b: ');
40 //Enter all inputs in the rupees only
41 DRb =((clb+ltlb)/(cab+ltab));//Debt ratio
42 DERb =(clb+ltlb)/eb;
43 tierb =(nib+ib+tb)/tb;
44 printf("\n Debt Ratio of company b= ")
45 disp(DRb);
46 printf("\n Debt Equity Ratio of company b = ")
47 disp(DERb);
48 printf("\n Times Interest Earned Ratio of company b"
);
49 disp(tierb);
50 if(DRa>DRb)
51     printf("Risk is high in company a");
52 elseif(DRa==DRb)
53     printf("Risk is equal in both companies");
54 else
55     print("Risk is high in company 2");
56 end
57 // sample output
58 //Enter the current liabilities of the company a
:10000
59 //Enter the Long term liabilities of the company a
:100000
60 //Enter the Current assests of the company a:200000
61 //Enter the Long-term assets of the company a:100000
62 //Enter the Equity of the company a: 100000
63 //Enter the Net income of the company a: 200000
64 //Enter the Interest amount of the company a: 50000
65 //Enter the Taxes of the company a: 30000
66 //Debt Ratio of company a=
67 // 0.3666667
68 //Debt Equity Ratio of company a =
69 // 1.1
70 //Times Interest Earned Ratio of company a
71 // 9.3333333
72 //Enter the current liabilities of the company b
:20000

```

```
73 //Enter the Long term liabilities of the company b
    :10000
74 //Enter the Current assests of the company b:20000
75 //Enter the Long-term assets of the company b
    :2000000
76 //Enter the Equity of the company b: 200000
77 //Enter the Net income of the company b: 100000
78 //Enter the Interest amount of the company b: 200000
79 //Enter the Taxes b: 100000
80 // Debt Ratio of company b=
81 //    0.0148515
82 // Debt Equity Ratio of company b =
83 //    0.15
84 // Times Interest Earned Ratio of company b
85 //    4.
86 //Risk is high in company a
```

Experiment: 3

Time value of money using compound interest method

Scilab code Solution 3.0 interest method

```
1 //Time value of money using compound interest method
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept Information
8 //Formula
9 //A = P(1 + r/n)^nt
10 //A = Accrued Amount (principal + interest)
11 //P = Principal Amount
12 //I = Interest Amount
13 //R = Annual Nominal Interest Rate in percent
14 //r = Annual Nominal Interest Rate as a decimal
15 //r = R/100
16 //t = Time Involved in years , 0.5 years is
    calculated as 6 months, etc.
17 //n = number of compounding periods per unit t; at
    the END of each period
```

```

18 //Inputs to be given are principal amount,Annual
    nominal interest Rate in percent ,compund and Time
    involved in years
19 P = input('Enter the principal amount :');//in
    rupees
20 R = input('Enter the Annual nominal Rate of Interest
    : ');
21 printf("\n enter compound=1 for yearly");
22 printf("\n enter compound=4 for quaterly");
23 n= input('Compound');
24 t=input('Enter the Time involved in years');//in
    years(0.5 years is calculated as 6 months,etc)
25 r=R/100;
26 A=P*((1+(r/n))^(n*t));
27 printf("Accrued Amount in rupees equal to:");
28 disp(A);
29 printf("Interest Amount in rupees equal to:");
30 disp(A-P);
31 //Output 1
32 //Enter the principal amount :2500
33
34 //Enter the Annual nominal Rate of Interest:4
35
36
37 //enter compound=1 for yearly
38 //enter compound=4 for quaterly
39 //Compound1
40
41 //Enter the Time involved in years10
42
43 //Accrued Amount in rupees equal to:
44 // 3700.6107
45 //Interest Amount in rupees equal to:
46 // 1200.6107
47
48
49 //Output 2
50 //Enter the principal amount :2500

```

```
51
52 //Enter the Annual nominal Rate of Interest:4
53
54
55 // enter compound=1 for yearly
56 //enter compound=4 for quaterly
57 //Compound4
58
59 //Enter the Time involved in years10
60
61 //Accrued Amount in rupees equal to:
62 // 3722.1593
63 //Interest Amount in rupees equal to:
64 // 1222.1593
```

Experiment: 4

EMI calculation

Scilab code Solution 4.0 EMI

```
1 //EMI calculation
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept Information
8 //Formula
9 //EMI= $PV \cdot i \cdot \left[ \frac{(1+i)^n}{(1+i)^n - 1} \right]$ 
10 //where
11 //EMI = Equated Monthly Installment
12 //PV = Loan Amount (Present Value)
13 //i = monthly interest rate in decimal form
14 //i=R/(12*100)
15 //n = number of months of the loan
16 P = input('Enter the principal amount :'); //in
    rupees
17 R = input('Enter the Annual nominal Rate of Interest
    :'); //Rate of interest per year
18 N = input('Enter the number of months :');
19 i=R/(12*100);
```

```
20 f=(1+i)^N;
21 EMI=P*i*f/(f-1);
22 printf("Monthly payment in rupees equal to");
23 disp(EMI);
24
25 //Output sample
26 //Enter the principal amount :16500
27 //Enter the Annual nominal Rate of Interest:5.125
28 //Enter the number of months :36
29 //Monthly payment in rupees equal to
30 // 495.44635
```

Experiment: 5

Insurance premium calculation using Money back plan + Bonus method

Scilab code Solution 5.0 Insurance

```
1 //Insurance premium calculation by Money back plan +
   bonus method
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept Information
8 //Formula
9 //Paid up value = ((Number of years of premium
   payment/Life of the policy)*Sum assured) + Bonus
10 //Inputs taken are Number of years of premium
   payment; Assured sum of amount; Life of the
   policy; Bonus
11 N = input("Enter the number of years of the premium
   payment :");
12 L = input("Enter the life time of the policy :");
```

```
13 B = input("Enter the bonus amount :");
14 A = input("Enter the assured sum of amount :");
15 p =((N/L)*A)+B;
16 printf("Paid up value is :");
17 disp(p);
18
19 //Sample Output
20 //Enter the number of years of the premium payment
    :5
21 //Enter the life time of the policy :20
22 //Enter the bonus amount :35000
23 //Enter the assured sum of amount :500000
24 //Paid up value is :
25 // 160000
```

Experiment: 6

Salvage value calculation

Scilab code Solution 6.0 salvage

```
1 //Salvage value calculation
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept Information
8 //Formula
9 //S=P(1-i)^Y
10 //S = salvage value
11 //P = original price
12 //i = nominal depreciation rate
13 //Y = age in years
14 p = input('Enter original price: ');
15 i = input('Enter nominal depreciation rate: ');
16 y = input('Enter number of years: ');
17 i = i/100;
18 sv = p*(1-i)^y;
19 printf("Salvage value is :");
20 disp(sv);
21
```

```
22 //Output
23 //Enter original price: 155
24 //Enter nominal depreciation rate: 22
25 //Enter number of years: 2
26 //Salvage value is :
27 // 94.302
```

Experiment: 7

Debt to Income ratio calculation

Scilab code Solution 7.0 DTI

```
1 //Debt-to-Income (DTI) Ratio Calculator
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept Information
8 //Formula
9 //DTI= Total debt/Total income
10 //Total income= Salary and earned income + Pension +
    Investment&Savings + Other income
11 //Debts = Rental cost + Mortgage + Property tax +
    Home owner insurance + Credit cards + loans +
    Liabilities
12 disp("Enter all values in dollars and per month")
13 s = input('Enter the Salary and earned income :');
14 p = input('Enter the Pension amount: ');
15 i = input('Enter the Investment and savings :');
16 oi = input('Enter the other income values :');
```

```

17 r = input('Enter the Rental cost :');
18 m = input('Enter the mortgage value :');
19 pt = input('Enter the property tax value :');
20 ho = input('Enter the Home owner insurance :');
21 c = input('Enter the Credit card amount :');
22 l = input('Enter the loan amount :');
23 ll = input('Enter other liabilities : ');
24 ti = s+p+i+oi;
25 d = r+m+pt+ho+c+l+ll;
26 DTI = d/ti;
27 printf("Debt to income ratio is :");
28 disp(DTI);
29 //Output
30 //Enter all values in dollars and per month"
31 //Enter the Salary and earned income :100000
32 //Enter the Pension amount: 0
33 //Enter the Investment and savings :50000
34 //Enter the other income values :30000
35 //Enter the Rental cost :100000
36 //Enter the mortgage value :20000
37 //Enter the property tax value :10000
38 //Enter the Home owner insurance :2000
39 //Enter the Credit card amount :200
40 //Enter the loan amount :5000
41 //Enter other liabilities : 10000
42 //Debt to income ratio is :
43 //    0.8177778

```

Experiment: 8

Price calculation

Scilab code Solution 8.0 Price calculation

```
1 //Price calculation
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept
8 //Revenue=Cost/(1 -Gross Margin)
9 //Gross Profit=Revenue -Gross Margin
10 //Mark Up = (Gross Profit/Cost) *100
11 //Inputs are cost and gross profit percentage
12 c = input('Enter the cost : ');
13 g = input('Enter the Gross profit percentage : ');
14 g = g/100;
15 r = c/(1-g);
16 gp = g*r ;
17 m = (gp/c)*100;
18 printf("Revenue = ");
19 disp(r);
20 printf('Gross profit =');
21 disp(gp);
```

```
22 printf("Mark up percentage =");
23 disp(m);
24 //output
25 //Enter the cost : 125
26 //Enter the Gross profit percentage : 75
27 //Revenue =
28 //    500.
29 //Gross profit =
30 //    375.
31 //Mark up percentage =
32 //    300
```

Experiment: 9

Units of production depreciation calculation

Scilab code Solution 9.0 Depreciation

```
1 //Units of production depreciation calculation
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept
8 //Formulas are
9 //Depreciable Base = Asset Cost – Salvage Value
10 //Depreciation per Unit = Depreciable Base / Total
    Units
11 //Depreciation for Period = Depreciation per Unit x
    Number of Units Produced in a Period
12 //Inputs are Asset Cost, Salvage Value, Useful Units
    , Units Production in Period
13 c = input('Enter the asset cost :');
14 s = input('Enter the salvage value :');
15 uu = input('Enter the no of useful units :');
16 up = input('Enter the units Production in period : ')
```

```
    );
17 db = c-s;
18 du = db/uu;
19 dp = du*up;
20 printf("Depreciable base =")
21 disp(db);
22 printf("Depreciation per unit =")
23 disp(du);
24 printf("Depreciation for period =")
25 disp(dp);
26 //output
27 //Enter the asset cost :750225
28 //Enter the salvage value :25000
29 //Enter the no of useful units :2000000
30 //Enter the units Production in period : 255626
31 //Depreciable base =
32 //    725225.
33 //Depreciation per unit =
34 //    0.3626125
35 //Depreciation for period =
36 //    92693.183
```

Experiment: 10

Yield to maturity(YTM) calculation

Scilab code Solution 10.0 YTM

```
1 //YTM (Yield to maturity calculation)
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept
8 //YTM = ((Face value / curent price)^(1/n))-1
9 //where:
10 //n=number of years to maturity
11 //Face value=bonds maturity value or par value
12 //Current price=the bonds price today
13 F = input('Enter the Face value of the bond :');
14 C = input('Enter the current bond price :');
15 n = input('Enter the time for maturity in year :');
16 YTM = ((F/C)^(1/n))-1;
17 printf('YTM (Yield to maturity calculation) =');
18 disp(YTM);
19 //Output
```

```
20 //Enter the Face value of the bond :105
21 //Enter the current bond price :90
22 //Enter the time for maturity in year :1
23 //YTM (Yield to maturity calcuation) =
24 // 0.1666667
```
