Scilab Manual for Finance calculations by Prof K.sreenivasa Charyulu Others Sreenidhi Institute Of Science And Technology[1]

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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 assset
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.
```

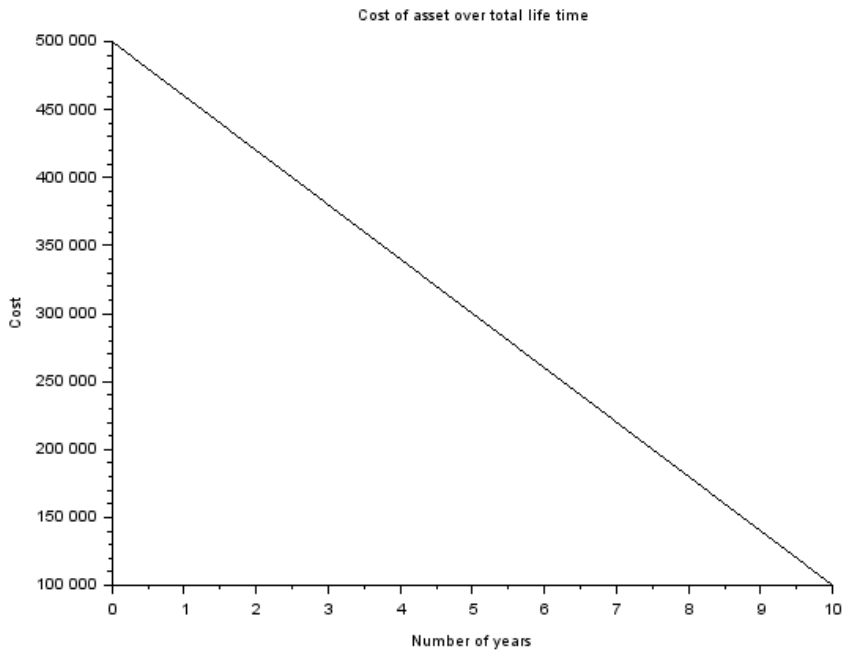


Figure 1.1: Depreciation

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: ');
```

```
tb =input('Enter the Taxes b: ');
//Enter all inputs in the rupees only
DRb =((clb+ltlb)/(cab+ltab));//Debt ratio
DERb =(clb+ltlb)/eb;
tierb =(nib+ib+tb)/tb;
printf("\n Debt Ratio of company b= ")
disp(DRb);
printf("\n Debt Equity Ratio of company b = ")
disp(DERb);
printf("\n Times Interest Earned Ratio of company b"
   );
disp(tierb);
if(DRa>DRb)
    printf("Risk is high in company a");
elseif(DRa==DRb)
    printf("Risk is equal in both companies");
else
    print("Risk is high in company 2");
end
// sample output
//Enter the current liabilities of the company a
   :10000
//Enter the Long term liabilities of the company a
   :100000
//Enter the Current assests of the company a:200000
//Enter the Long-term assets of the company a:100000
//Enter the Equity of the company a: 100000
//Enter the Net income of the company a: 200000
//Enter the Interest amount of the company a: 50000
//Enter the Taxes of the company a: 30000
//Debt Ratio of company a=
//    0.3666667
//Debt Equity Ratio of company a =
//    1.1
//Times Interest Earned Ratio of company a
//    9.3333333
//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=P V  i  [((1+i)^n)/((1+i)^ n 1 )]
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 calcculation
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 : '
```

```
    );
db = c-s;
du = db/uu;
dp = du*up;
printf("Depreciable base =")
disp(db);
printf("Depreciation per unit =")
disp(du);
printf("Depreciation for period =")
disp(dp);
//output
//Enter the asset cost :750225
//Enter the salvage value :25000
//Enter the no of useful units :2000000
//Enter the units Production in period : 255626
//Depreciable base =
//   725225.
//Depreciation per unit =
//   0.3626125
//Depreciation for period =
//   92693.183
```

Experiment: 10

Yield to maturity(YTM) calculation

Scilab code Solution 10.0 YTM

```
1 //YTM (Yield to maturity calcuation)
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 calcuation) =');
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
```
