

Scilab Manual for
Finance calculations
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Others

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<http://spoken-tutorial.org/NMEICT-Intro>. This Scilab Manual and Scilab codes
written in it can be downloaded from the "Migrated Labs" section at the website
<http://scilab.in>

Contents

List of Scilab Solutions	3
1 Depreciation Accounting using straight line method	5
2 Risk calculation using Debt ratio	8
3 Time value of money using compound interest method	12
4 EMI calculation	15
5 Insurance premium calculation using Money back plan + Bonus method	17
6 Salvage value calculation	19
7 Debt to Income ratio calculation	21
8 Price calculation	23
9 Units of production depreciation calculation	25
10 Yield to maturity(YTM) calculation	27

List of Experiments

Solution 1.0	Depreciation	5
Solution 2.0	Risk calculation	8
Solution 3.0	interest method	12
Solution 4.0	EMI	15
Solution 5.0	Insurance	17
Solution 6.0	salvage	19
Solution 7.0	DTI	21
Solution 8.0	Price calculation	23
Solution 9.0	Depreciation	25
Solution 10.0	YTM	27

List of Figures

1.1 Depreciation	7
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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.

```

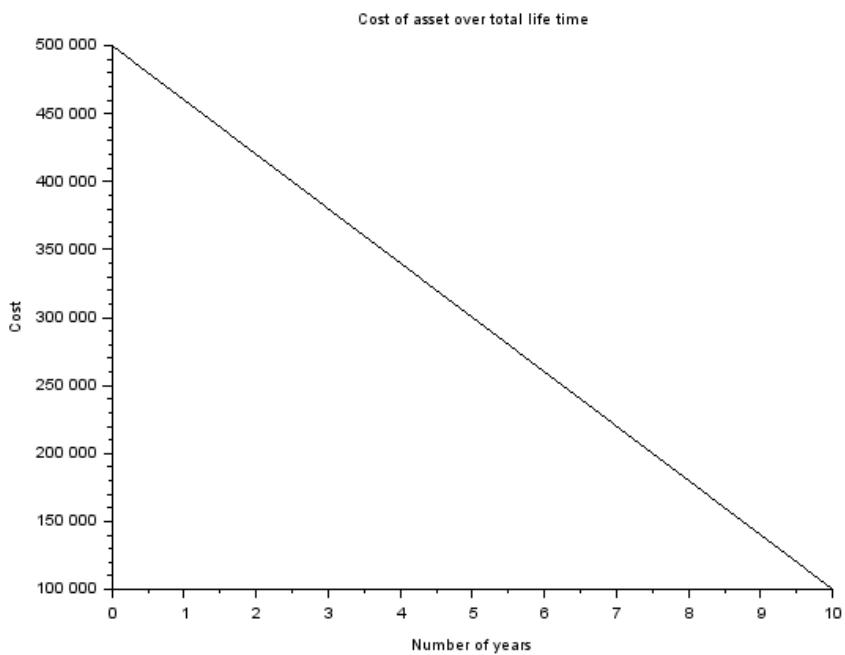


Figure 1.1: Depreciation

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 assets 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 assets 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+l1b)/(cab+ltab)); //Debt ratio
42 DERb =(clb+l1b)/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 assets 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 // 0.36666667
68 //Debt Equity Ratio of company a =
69 // 1.1
70 //Times Interest Earned Ratio of company a
71 // 9.33333333
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 assets 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 // $A = \text{Accrued Amount (principal + interest)}$ 
11 // $P = \text{Principal Amount}$ 
12 // $I = \text{Interest Amount}$ 
13 // $R = \text{Annual Nominal Interest Rate in percent}$ 
14 // $r = \text{Annual Nominal Interest Rate as a decimal}$ 
15 // $r = R/100$ 
16 // $t = \text{Time Involved in years, 0.5 years is calculated as 6 months, etc.}$ 
17 // $n = \text{number of compounding periods per unit t; at the END of each period}$ 
```

```

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 // $EMI = PV \cdot i \cdot [(1+i)^n / ((1+i)^n - 1)]$ 
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
21 //:5
22 //Enter the life time of the policy :20
23 //Enter the bonus amount :35000
24 //Enter the assured sum of amount :500000
25 //Paid up value is :
26 // 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 calcuation )
2 //OS :Windows 10
3 //Scilab 6.1.0
4 clear;
5 clc;
6 close;
7 //Concept
8 //YTM = (( Face value / current 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
```
