Scilab Manual for
Finance calculations
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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.
```
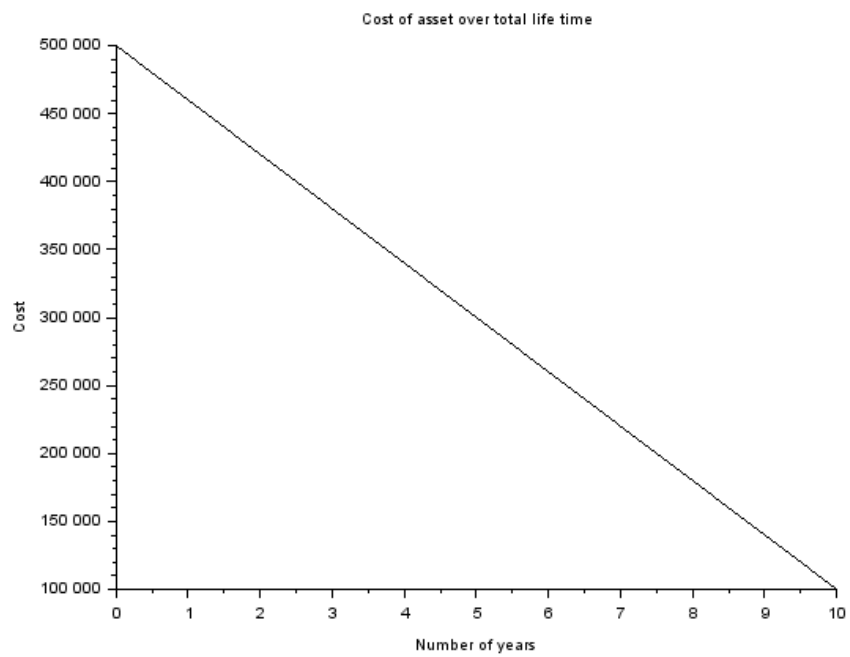
Figure 1.1: Depreciation

Experiment: 2

Risk calculation using Debt ratio

Scilab code Solution 2.0 Risk calculation

```scilab
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
```

```scilab
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
```

13

```
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

```scilab
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 :');
```

```matlab
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
```

22

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 : '
```

```
        );
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 / 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
```