Question 1 –

Example 1 -

```
> java ProgrammingTest_Question1.java
The program prints the volume, surface area and circumference of a capsule
 having radius r ranging from 6 to N in increments of 6 and side length a
Enter the value for N: 45
Enter the length of side a: 6
Radius          Volume      Surface Area    Circumference
-------------------------------------------------------------
6               1583.363    678.5840        37.6991
12              9952.566    2261.9467       75.3982
18              30536.281   4750.0881       113.0973
24              68763.180   8143.0082       150.7964
30              130061.936  12440.7069      188.4956
36              219861.220  17643.1843      226.1947
42              343589.705  23750.4405      263.8938
```

Example 2 -

```
> java ProgrammingTest_Question1.java
The program prints the volume, surface area and circumference of a capsule
 having radius r ranging from 6 to N in increments of 6 and side length a
Enter the value for N: 54
Enter the length of side a: 2.50
Radius          Volume      Surface Area    Circumference
-------------------------------------------------------------
6               1187.522    546.6371        37.6991
12              8369.203    1998.0529       75.3982
18              26973.715   4354.2474       113.0973
24              62429.729   7615.2206       150.7964
30              120165.919  11780.9725      188.4956
36              205610.956  16851.5030      226.1947
42              324193.512  22826.8122      263.8938
48              481342.260  29706.9001      301.5929
```

Example 3 -

```
> java ProgrammingTest_Question1.java
The program prints the volume, surface area and circumference of a capsule
 having radius r ranging from 6 to N in increments of 6 and side length a
Enter the value for N: 68
Enter the length of side a: 5.45
Radius          Volume      Surface Area    Circumference
-------------------------------------------------------------
6               1521.159    657.8495        37.6991
12              9703.751    2220.4777       75.3982
18              29976.449   4687.8846       113.0973
24              67767.923   8060.0701       150.7964
30              128506.847  12337.0344      188.4956
36              217621.893  17518.7773      226.1947
42              340541.732  23605.2989      263.8938
48              502695.037  30596.5992      301.5929
54              709510.480  38492.6781      339.2920
60              966416.732  47293.5358      376.9911
66              1278842.467 56999.1722      414.6902
```

Question 2 –

Example 1 -

```
: java ProgrammingTest_Question2.java
Enter the number of projects: 2

Enter the name of the project: Mars
Enter the upfront cost for project Mars: 35000
Enter rate of return or discount rate(in %): 12
Enter the duration(in years): 3
Enter the cash inflow-outflows during year 1: 10000
Enter the cash inflow-outflows during year 2: 27000
Enter the cash inflow-outflows during year 3: 19000

Enter the name of the project: Inception
Enter the upfront cost for project Inception: 35000
Enter rate of return or discount rate(in %): 12
Enter the duration(in years): 2
Enter the cash inflow-outflows during year 1: 27000
Enter the cash inflow-outflows during year 2: 27000


                        Mars
-----------------------------------------------------------------
Year    |   Cash            |   PV Factor   |   Amount
    |   Inflows/Outflows    |
-----------------------------------------------------------------
1       |   $10,000.00      |   0.8929      |   $8,928.57
2       |   $27,000.00      |   0.7972      |   $21,524.23
3       |   $19,000.00      |   0.7118      |   $13,523.82
Total Income: $56,000.00
Present Value of Future Benefits: $43,976.63
Present Value of Future Costs: $35,000.00
Net Present Value(NPV): $8,976.63
```

```
                    Inception
-----------------------------------------------------------------
Year    |   Cash            |   PV Factor   |   Amount
    |   Inflows/Outflows    |
-----------------------------------------------------------------
1       |   $27,000.00      |   0.8929      |   $24,107.14
2       |   $27,000.00      |   0.7972      |   $21,524.23
Total Income: $54,000.00
Present Value of Future Benefits: $45,631.38
Present Value of Future Costs: $35,000.00
Net Present Value(NPV): $10,631.38

The Highest income is generated by project: Mars
The project the company should be executing is: Inception
:
```

Example 2 –

```
> java ProgrammingTest_Question2.java
Enter the number of projects: 3

Enter the name of the project: Genesis
Enter the upfront cost for project Genesis: 100000
Enter rate of return or discount rate(in %): 6
Enter the duration(in years): 3
Enter the cash inflow-outflows during year 1: 50000
Enter the cash inflow-outflows during year 2: 30000
Enter the cash inflow-outflows during year 3: 60000

Enter the name of the project: Griffin
Enter the upfront cost for project Griffin: 45000
Enter rate of return or discount rate(in %): 2
Enter the duration(in years): 2
Enter the cash inflow-outflows during year 1: 30000
Enter the cash inflow-outflows during year 2: 20000

Enter the name of the project: Origin
Enter the upfront cost for project Origin: 79998.76
Enter rate of return or discount rate(in %): 3
Enter the duration(in years): 3
Enter the cash inflow-outflows during year 1: 40000
Enter the cash inflow-outflows during year 2: 20000
Enter the cash inflow-outflows during year 3: 50876
```

```
                    Genesis
-------------------------------------------------------------
Year    |   Cash            |   PV Factor   |   Amount
    |   Inflows/Outflows    |
-------------------------------------------------------------
1       |   $50,000.00      |   0.9434      |   $47,169.81
2       |   $30,000.00      |   0.8900      |   $26,699.89
3       |   $60,000.00      |   0.8396      |   $50,377.16
Total Income: $140,000.00
Present Value of Future Benefits: $124,246.86
Present Value of Future Costs: $100,000.00
Net Present Value(NPV): $24,246.86

                    Griffin
-------------------------------------------------------------
Year    |   Cash            |   PV Factor   |   Amount
    |   Inflows/Outflows    |
-------------------------------------------------------------
1       |   $30,000.00      |   0.9804      |   $29,411.76
2       |   $20,000.00      |   0.9612      |   $19,223.38
Total Income: $50,000.00
Present Value of Future Benefits: $48,635.14
Present Value of Future Costs: $45,000.00
Net Present Value(NPV): $3,635.14
```

```
                    Origin
-------------------------------------------------------------
Year    |   Cash            |   PV Factor   |   Amount
    |   Inflows/Outflows    |
-------------------------------------------------------------
1       |   $40,000.00      |   0.9709      |   $38,834.95
2       |   $20,000.00      |   0.9426      |   $18,851.92
3       |   $50,876.00      |   0.9151      |   $46,558.75
Total Income: $110,876.00
Present Value of Future Benefits: $104,245.62
Present Value of Future Costs: $79,998.76
Net Present Value(NPV): $24,246.86

The Highest income is generated by project: Genesis
The project the company should be executing is: Genesis
```

Example 3 –

```
java ProgrammingTest_Question2.java
Enter the number of projects: 2

Enter the name of the project: Saturn
Enter the upfront cost for project Saturn: 10000
Enter rate of return or discount rate(in %): 12
Enter the duration(in years): 2
Enter the cash inflow-outflows during year 1: 10000
Enter the cash inflow-outflows during year 2: 20000

Enter the name of the project: Jupiter
Enter the upfront cost for project Jupiter: 20000
Enter rate of return or discount rate(in %): 10
Enter the duration(in years): 2
Enter the cash inflow-outflows during year 1: 10000
Enter the cash inflow-outflows during year 2: 20000


                    Saturn
-----------------------------------------------------------------
Year    |   Cash            |   PV Factor   |   Amount
    |   Inflows/Outflows    |
-----------------------------------------------------------------
1       |   $10,000.00      |   0.8929      |   $8,928.57
2       |   $20,000.00      |   0.7972      |   $15,943.88
Total Income: $30,000.00
Present Value of Future Benefits: $24,872.45
Present Value of Future Costs: $10,000.00
Net Present Value(NPV): $14,872.45
```

```
                    Jupiter
-----------------------------------------------------------------
Year    |   Cash            |   PV Factor   |   Amount
    |   Inflows/Outflows    |
-----------------------------------------------------------------
1       |   $10,000.00      |   0.9091      |   $9,090.91
2       |   $20,000.00      |   0.8264      |   $16,528.93
Total Income: $30,000.00
Present Value of Future Benefits: $25,619.83
Present Value of Future Costs: $20,000.00
Net Present Value(NPV): $5,619.83

The Highest income is generated by project: Saturn
The project the company should be executing is: Saturn
```

Question 3 –

1. Normalized Tables –

(Name_Department)

Number of Records: 5

Employee_Name	Department
James Tevlin	Engineering
John Smith	Managment
Luke Ye	Sales
Mark Brown	Marketing
Ross Becker	HR

(Id_Name_year_Vacation)

Number of Records: 14

Employee_Id	Employee_Name	Year	Vacation_Days
12	Luke Ye	2011	6
12	Luke Ye	2012	1
12	Luke Ye	2013	2
13	Mark Brown	2012	2
13	Mark Brown	2012	5
14	John Smith	2011	3
14	John Smith	2011	10
15	Mark Brown	2013	8
15	Mark Brown	2014	2
16	James Tevlin	2011	4
16	James Tevlin	2012	3
17	Ross Becker	2012	1
17	Ross Becker	2012	3
17	Ross Becker	2013	2

2. Output Table –

Number of Records: 11

Employee_Id	Employee_Name	Department	Year	sum(nyv.Vacation_Days)
16	James Tevlin	Engineering	2011	4
16	James Tevlin	Engineering	2012	3
14	John Smith	Managment	2011	13
12	Luke Ye	Sales	2011	6
12	Luke Ye	Sales	2012	1
12	Luke Ye	Sales	2013	2
13	Mark Brown	Marketing	2012	7
15	Mark Brown	Marketing	2013	8
15	Mark Brown	Marketing	2014	2
17	Ross Becker	HR	2012	4
17	Ross Becker	HR	2013	2