



# Programming Fundamentals

Course Work 04

## Introduction

This is a Java program that is used for a financial management system with various functionalities such as deposit, loans, tax calculations, etc. It requires the user to enter their data into the program.

## Case Study

This financial management system includes features for various financial tasks, including banking operations, loan management, and tax calculations.

The system is designed to simplify the complex process of tax calculation by allowing users to input their earnings under different tax categories.

Based on this input, the system calculates the tax amounts, providing users with an efficient and accurate tax amount. Additionally, the system can also calculate the leasing payments.



Figure 1 – Use case Diagram

## Instructions

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When you run the application, you should come up with something similar to the following Command Line Interface (CLI), where the user should enter the option number they want to execute. This will be the Home Page of the application that you will be developing.



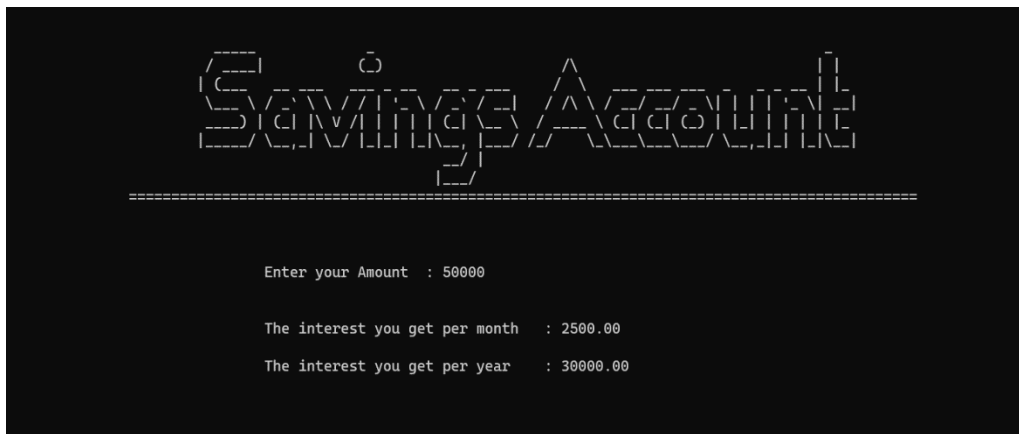
```
Bank System
=====

[1] Deposit      [2] Loans
[3] Tax          [4] Share market
[5] Exit

Enter an option to continue ->
```

Figure 2 – Home Page



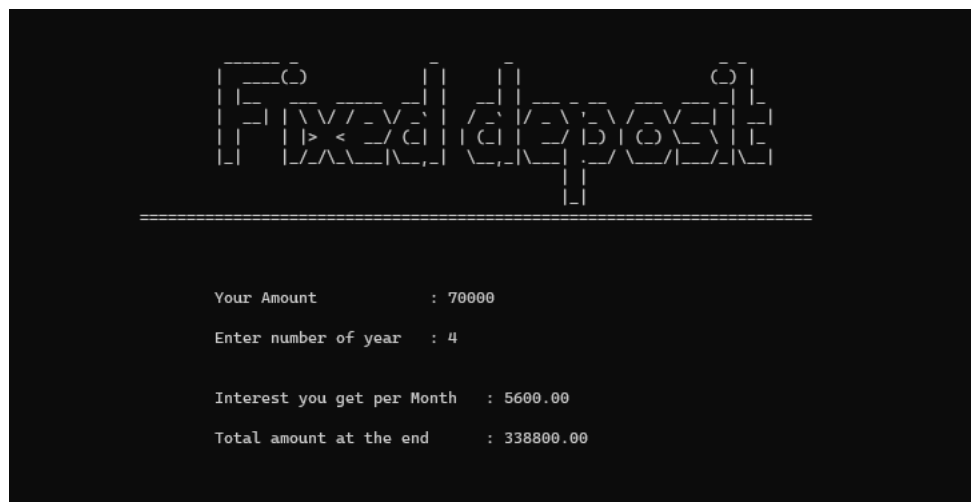


**Figure 4 – Savings Account**

## **[2] Fixed Deposit**

The below CLI should be displayed to the user if they choose option 2 in Deposit.

The program should calculate the interest per month and the total amount of interest at the end according to the amount and number of years the user enters.




**Figure 5 – Fixed Deposit**

## Option 2 – Loans

Once the user selects option 2, the below CLI should be displayed.

The user required to enter the option they need.



```

      Loan
=====

[1] Personal Loan
[2] Business Loan
[3] Home equity Loan
[4] Car finance

Enter an option to continue ->
```

Figure 6 – Loan

### [1] Personal Loan

The below CLI should be displayed to the user if they choose option 1 in Loan.

The program should calculate the monthly installments according to the amount and number of months the user enters.

**NOTE :**

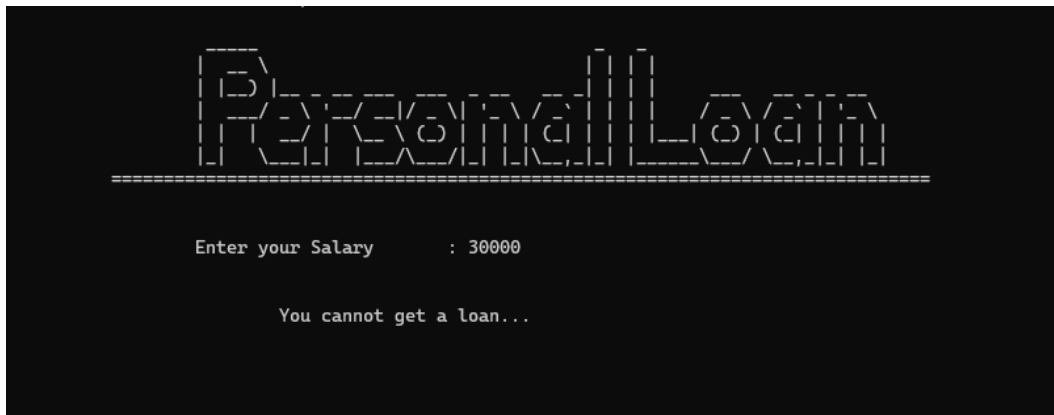
- The user can only receive a personal Loan if the salary is OVER or EQUAL to 50,000. Once the salary meets the requirement the maximum amount withdrawn should be calculate as such :  $\text{salary} * 5 = \text{amount}$ .
- Follow the below guidelines to calculate the installments.

Personal Loan  $\rightarrow$  salary  $\geq$  50000

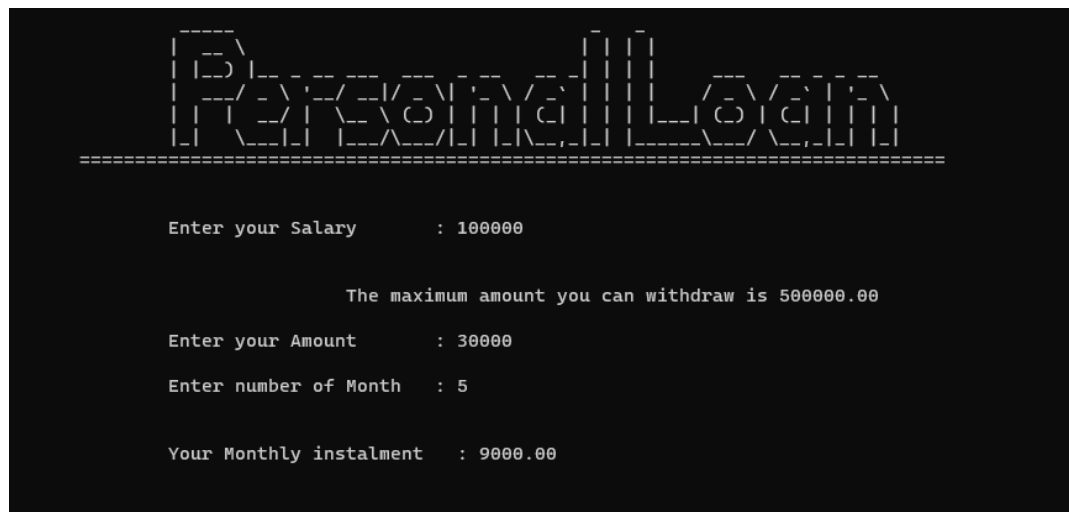
Personal Loan  $\rightarrow$  salary  $* 5 ==$  amount

Personal Loan  $\rightarrow$  Amount  $> 200000$  & year  $> 2 = 15\%$

Personal Loan  $\rightarrow$  Amount  $< 200000$  & year  $< 2 = 10\%$



**Figure 7 – Failed attempt for a Personal Loan**



**Figure 8 – Successful attempt for a Personal Loan**

## [2] Business Loan

The below CLI should be displayed to the user if they choose option 2 in Loan.

The program should calculate the monthly installments according to the amount and number of months the user enters.

### NOTE :

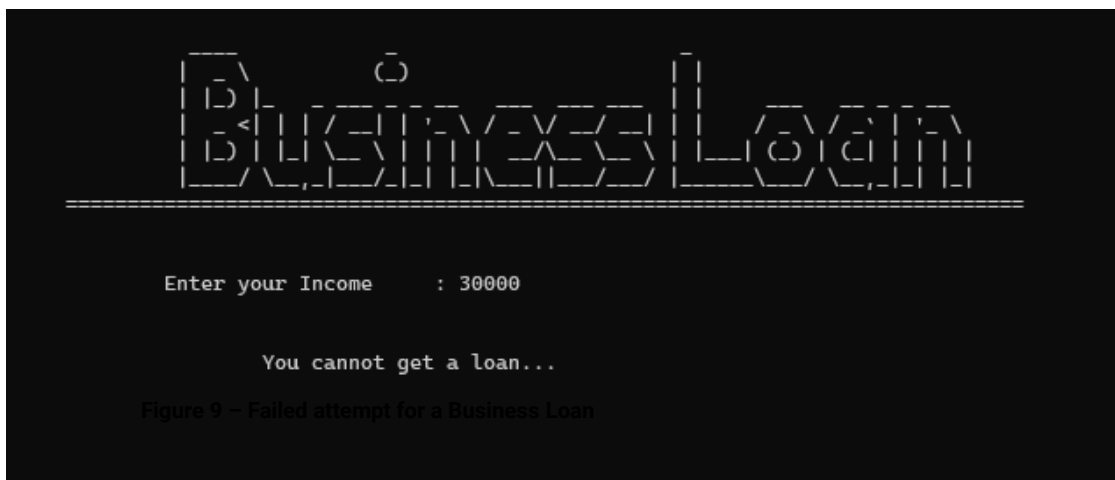
- The user can only receive a Business Loan if the salary is OVER or EQUAL to 50,000. Once the salary meets the requirement the maximum amount withdrawn should be calculate as such : salary \* 5 = amount.
- Follow the below guidelines to calculate the installments.

Business Loan → salary  $\geq$  50000

Business Loan → income \* 5 == amount

Business Loan → Amount > 500000 & year > 3 = 20%

Business Loan → Amount < 500000 & year < 3 = 15%





```

      _____
     /          \
    /             \
   /               \
  /                 \
 /                   \
/                     \
=====

Enter your Income      : 80000

                        The maximum amount you can withdraw is 400000.00

Enter your Amount      : 200000

Enter number of month  : 7

Your Monthly instalment : 32380.95
  
```

Figure 10 – Successful attempt for a Business Loan

### [3] Home Equity Loan

The below CLI should be displayed to the user if they choose option 3 in Loan.

The program should calculate the monthly installments according to the amount and number of months the user enters.

**NOTE :**

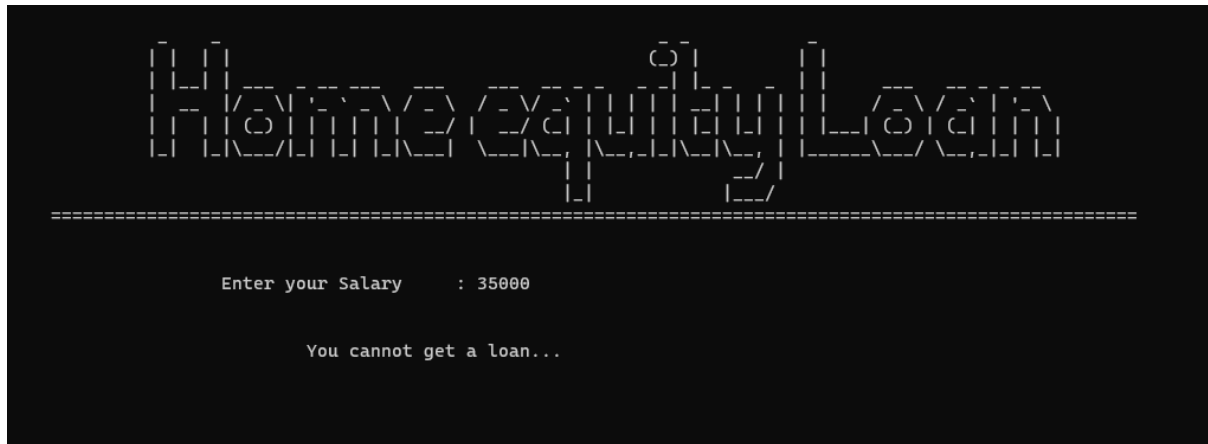
- The user can only receive a Home Equity Loan if the salary is OVER or EQUAL to 50,000. Once the salary meets the requirement the maximum amount withdrawn should be calculate as such : salary \* 5 = amount.
- Follow the below guidelines to calculate the installments.

Home equity Loan → salary >= 50000

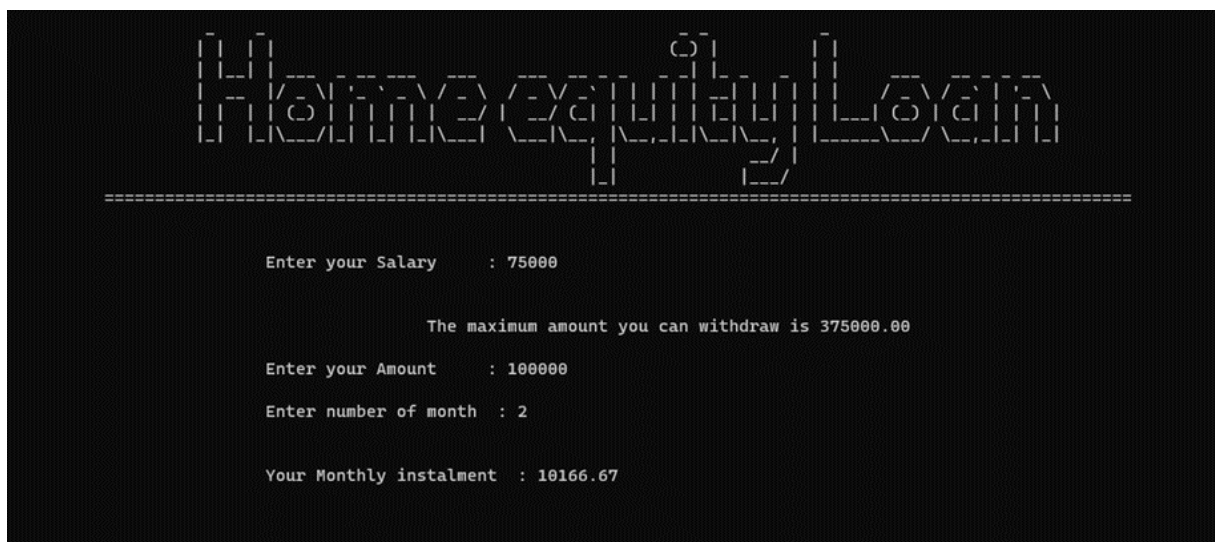
Home equity Loan → salary \* 5 == amount

Home equity Loan → salary > 50000 & year < 4 = 8%

Home equity Loan → salary < 50000 & year < 4 = 6%



**Figure 11 – Failed attempt for a Home Equity Loan**



**Figure 12 – Successful attempt for a Home Equity Loan**

## [4] Car Finance Loan

The below CLI should be displayed to the user if they choose option 4 in Loan.

The program should calculate the monthly installments according to the value of the vehicle and number of months the user enters.

**NOTE :**

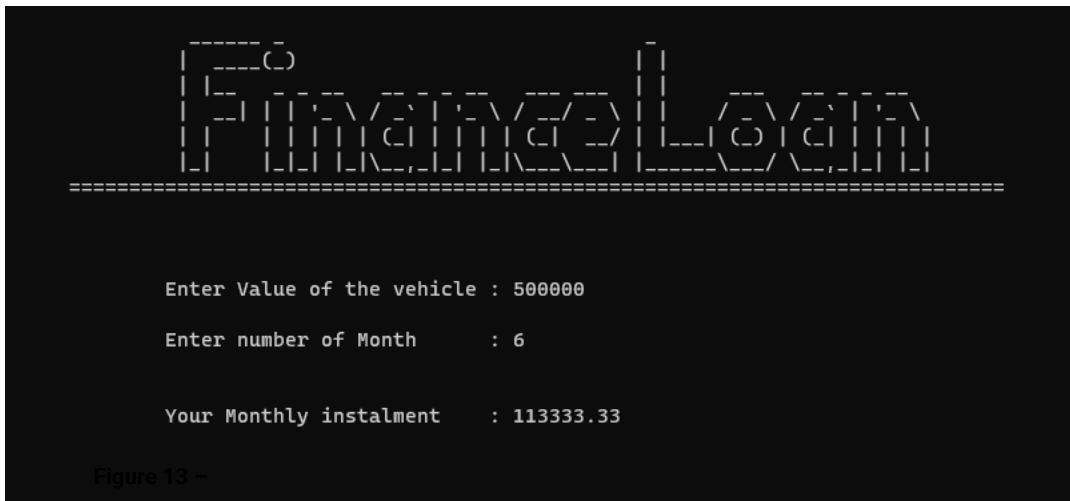
- Follow the below guidelines to calculate the Monthly installment.

Car finance  $\rightarrow$  Month < 12 = 6%

Car finance  $\rightarrow$  Month > 12 & month < 24 = 10%

Car finance  $\rightarrow$  Month > 24 & month < 36 = 14%

Car finance  $\rightarrow$  Month > 36 = 16%



```

Finance Loan
=====
Enter Value of the vehicle : 500000
Enter number of Month      : 6
Your Monthly instalment    : 113333.33
  
```

Figure 13 –

**Successful attempt for a Finance Loan**



## [2] Income Tax

The below CLI should be displayed to the user if they choose option 2 in Tax.

Income Tax is the amount of tax paid on the annual income of the person.

The percentage of annual Income Tax is given below.

**NOTE** : The user is NOT required to pay the Income tax if their salary is lesser than 1,200,000, and a message should be displayed to the user regarding this. Example – “You are not required to pay Income tax.”

- Income Tax is charged above Rs.1,200,000 and no tax is charged up to Rs.1,200,000.
- Rs.1 200 000 to the 1st Rs.500 000 (1 200 000 – 1 700 000) - 6%
- Rs.1 200 000 to the 2nd Rs. 500 000 (1 700 000 – 2 200 000) - 12%
- Rs.1 200 000 to the 3rd Rs. 500 000 (2 200 000 – 2 700 000) - 18%
- Rs.1 200 000 to the 4th Rs. 500 000 (2 700 000 – 3 200 000) - 24%
- Rs.1 200 000 to the 5th Rs. 500 000 (3 200 000 – 3 700 000) - 30%
- More than Rs. 3 700 000 - 36%



```
Income Tax
=====
Enter your total income per year : 5400000

You have to pay Income Tax per year : 1062000.00
```

Figure 16 – Income Tax

### [3] Payable Tax

The company keeps a percentage of an employee's salary and pays it as a tax, it is called Payable Tax. The percentage of monthly Payable Tax is given below.

The below CLI should be displayed to the user if they choose option 3 in Tax.

**NOTE :** The user is NOT required to pay the Payable tax if the employment payment per month is lesser than 100 000 and a message should be displayed to the user regarding this. Example – “You are not required to pay Payable tax.”

- Payable Tax is charged above Rs.100 000 and no tax is charged up to Rs.100 000.
- Rs.100 000 to the 1st Rs.41 667 (100 000 – 141 667) - 6%
- Rs.141 667 to the 2nd Rs.41 667 (141 667 – 183 333) - 12%
- Rs.183 333 to the 3rd Rs.41 667 (183 333 – 225 000) - 18%
- Rs. 225 000 to the 4th Rs.41 667 (225 000 – 266 667) - 24%
- Rs.266 667 to the 5th Rs.41 667 (266 667 – 308 333) - 30%
- More than Rs.308 333 - 36%

Several monthly incomes and the total Payable Tax are given in the table below.

Ex:- If an employee receives Rs.900 000 salary per month, his total amount of monthly Payable Tax is Rs.250 500.

Monthly Income	Tax rate	Tax
100,000	NIL	
141,667	6%	2,500
183,333	12%	7,500
225,000	18%	15,000
266,667	24%	25,000
308,333	30%	37,500
350,000	36%	52,500
450,000	36%	88,500
550,000	36%	124,500
650,000	36%	160,500
750,000	36%	196,500
900,000	36%	250,500
1,000,000	36%	286,500

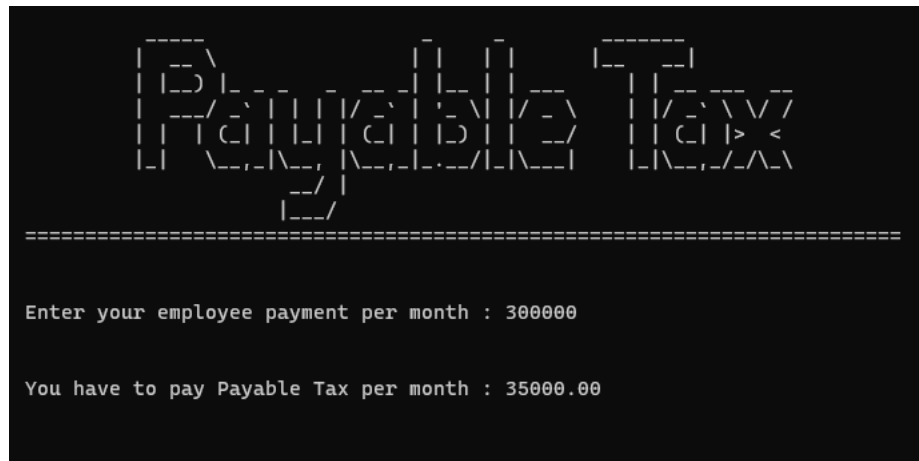


Figure 17 – Payable Tax

## [4] Leasing

The user should enter lease amount, the annual interest rate and the number of years. The System should calculate the monthly installment using the above formula and display it to the user.

Lease Payment Calculation Formula

$$\text{Monthly installment} = A \times i / (1 - (1 / (1 + i)^n))$$

A – lease amount

n – number of month

i - annual interest rate / 12

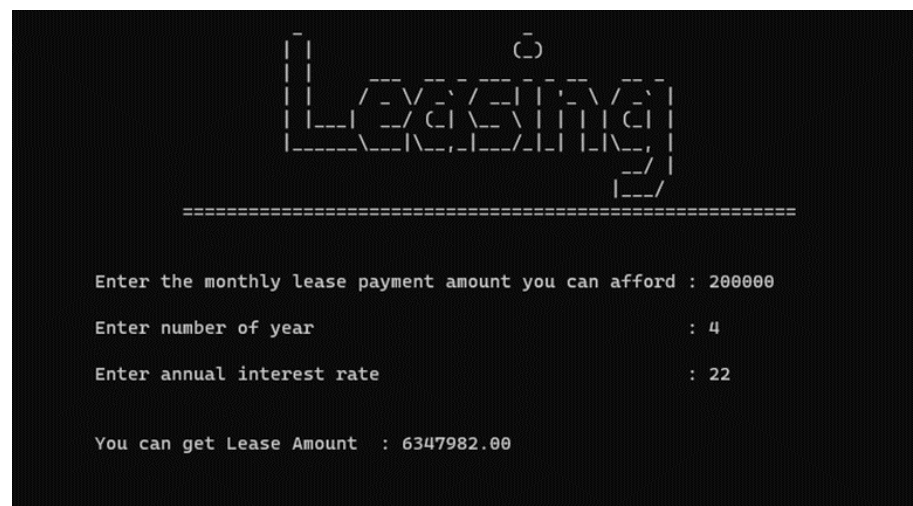


Figure 18 – Leasing

## Option 4 – Share Market

In simple terms, the share market, also known as the stock market, is a place where individuals and institutions can buy and sell shares (or stocks) of publicly traded companies.

The below CLI should be displayed to the user if they choose option 4 in the home page.

The user is required to enter the amount, the number of shares available and the annual dividend should be calculated by the system.

**NOTE** : 1 share price = 80

1 share dividend = 6

```
Enter an
Share Market
=====

Enter your amount : 200000

Number of shares available : 2500

Annual dividend          : 180000.00
```

Figure 19 – Share Market

## Option 5 – Exit

The program should terminate.



## Guidelines

- Refer to the Coursework Guidelines at the end to understand the specific guidelines to be followed when developing the project required.
- Use the Scanner class to get input from the command-line interface.
- Submission - You should attach your Java file and the video file separately with the file name format [BatchNumber\_ Name], and submit on or before the deadline.
- If you still have any questions, feel free to message us!