1. Book Shop Inventory

**Problem Statement:** A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, prize, publisher and stock position. Whenever customer wants a book, the sale person inputs the title and author and system searches the list and display whether it is available or not. If it is not, an appropriate message is displayed. If it is, the system displays the book details and request for the number of copies required. If the required copies are available, the total cost of the requested copies is displayed; otherwise the message “Required copies not in stock” is displayed.

**Design** a system using a class called books with suitable instance variables and methods.

1. Bank Management System

**Problem Statement:** Assume that a bank maintains two kinds of accounts for customers, one called as saving account and the other as current account. The saving account provides compound interest and withdrawal facility. The current account provides cheque book facility but no interest. Current account holders should also maintain the minimum balance and if the balance falls below this level, a service charge is imposed.

**Design** a class account that stores customer name, account number and type of account. From this derive the classes cur\_acct and sav\_acct to make them more specific to their requirements. Include necessary methods in order to achieve following tasks:

1. Accept deposit from the customer and update the balance
2. Display the balance
3. Compute and deposit interest.
4. Permit withdrawal and update the balance
5. Check the minimum balance, impose penalty, and update the balance.
6. An electricity board charges the following rates to domestic users to discourage large consumption of energy:

For the first 100 units – 60P per unit

For the next 200 units – 80P per unit

Beyond 300 units – 90P per unit

All users are charges a minimum of Rs. 50.00 if the total amount is more than Rs. 300.00 then an additional sub charge of 15% is added.

**Design** a program to read the names of users and number of units consumed and print out the charges with names.

1. Student Management System

**Create** a program for maintaining a database of student records using **Files.**

Student has student\_id, name, roll\_no, class, marks and address. Display the data for few students.

* 1. Create Database
  2. Display Database
  3. Delete Records
  4. Update Record
  5. Search Record

1. **Create** an array list (ArrayList class) of characters with following operations:
2. Add
3. Display
4. Delete
5. Modify

Validate data type and **throw exception**.