**1. Simple Calculator: Write a program to input two numbers and find their addition, subtraction, multiplication, and division and display the result.**

**2. Write a program to input the length of the radius of the circle. Calculate area and perimeter of circle. Also calculate the length of the side of the square whose perimeter is the same as the circle's perimeter.**

**3. Write a program to input marks of three subjects of a student calculate and display total and percentage of student**

**4. Write a program to input the quantity and unit price of a sold item. Calculate bill amount. Allow 15% of discount on bill amount. Find the final bill amount. Display discount and final bill amount.**

**5. Create lambda function find factorial of number. Use this function to calculate and display the factorial of the number.**

**6. Create a lambda function to find the greatest and smallest elements from an array. Use the same functions to find the greatest and smallest element of the array and display it.**

**7. Write a program to input a number n and display first n terms of Fibonacci series. E.g. if n = 8 then output should be 0 1 1 2 3 5 8 13.**

**8. Write a program to display first n Prime numbers.**

**9. Write a program to display first n Palindrome numbers.**

**10 . Write a program to input a year and check whether it is leap year or not.**

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A)

**"Point-Of-Sale Application:(POS)**

POS is used in shopping malls for bill printing at checkout counters. At the checkout counter operator feeds data about the customer as customer name, mobile number, address and sale details of n items such as item id, item name, price and quantity. At the end customer receives a detailed bill which includes customer details, purchase details and total bill amount.

Write a program to simulate a POS application. "

B)

**University Result System:**

Every course in university has course name and n number of subjects. Every subject has name, max marks, minimum passing marks. Student enrolls for some course. At the time of enrollment user has to provide his details such as Name, Mobile Number, Date of Birth, address. After completion of course students has to appear for the exam. Student is considered passed for particular subject if he/she scores marks greater than minimum passing marks in each subject. Student has to pass every subject to complete the course. University inputs details of n students about their course, marks obtained in each subject and calculates their total marks and percentage. At the end list of all the students result is displayed in the descending order of their percentage.

Write a program to simulate the University Result System. Provide an option to sort the result alphabetically by student name, ascending or descending order of percentage. Create appropriate classes with appropriate properties/data members, functions

**3. Banking Application:**

Bank maintains customer accounts. Each account has details such as account number, name of account holder, account type(Current/Saving) and Transactions. Customer can either withdraw or deposit amount from it's own account i.e. transaction. For each transaction bank stores details as transaction id, transaction type (Withdraw/Deposit), transaction amount, date and time of transaction.

Bank creates new account. Account number is auto assigned to accounts by increment last account number. Bank also closes account of customer on request. Bank accountants search and display account details including transactions on customer request.

Write a menu driven program for various operations such as 1) Open New Account 2) Deposit Amount 3) Withdraw amount 4) Search Account by A/C no 5) Search by Name 6) Close Account 0) Exit the application.

Create appropriate classes, data members/properties, constructors, functions to write programs for above mentioned requirements."

**Implement user defined exceptions for following scenarios:**

a) InsufficientFundsException when balance is not sufficient for withdrawal operation.

b) InvalidAccountNumberException while withdrawing and depositing amount to the account.