

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 1:**

Implement a Menu Driven Program for Arithmetic calculator using class & object & Operator Overloading Concepts.

Test case:

\*\*\*\*\*MENU\*\*\*\*\*

1. +      2. -      3. \*      4. /      5. %

Enter your choice operator: -

Enter First Number:10

Enter Second Number:5

Subtraction is:5

Do you want to continue(Y/N): N

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 2:**

Implement a class Complex which represents the Complex Number data type. Implement the following operations:

- Constructor (including a default constructor which creates the complex number  $0+0i$ ).
- Overloaded operator + to add two complex numbers.
- Overloaded operator - to add two complex numbers.
- Overloaded operator\* to multiply two complex numbers.
- Overloaded << and >> to print and read Complex Numbers.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 3:**

Implement a class Quadratic that represents degree two polynomials i.e., polynomials of type  $ax^2+bx+c$ . The class will require three data members corresponding to a, b and c. Implement the following operations:

- A constructor (including a default constructor which creates the 0 polynomial).
- Overloaded operator+ to add two polynomials of degree 2.
- Overloaded << and >> to print and read polynomials. To do this, you will need to decide what you want your input and output format to look like.
- A function eval that computes the value of a polynomial for a given value of x.
- A function that computes the two solutions of the equation  $ax^2+bx+c=0$ .

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 4:**

Create a class Rational Number (fractions) with the following capabilities:

- Create a constructor that prevents a 0 denominator in a fraction, reduces or simplifies fractions that are not in reduced form and avoids negative denominators.
- Overload the addition, subtraction, multiplication and division operators for this class.
- Overload the relational and equality operators for this class

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 5:**

Write C++ Program with base class convert declares two variables, val1 and val2, which hold the initial and converted values, respectively. It also defines the functions getinit( ) and getconv( ), which return the initial value and the converted value. These elements of convert are fixed and applicable to all derived classes that will inherit convert. However, the function that will actually perform the conversion, compute ( ), is a pure virtual function that must be defined by the classes derived from convert. The specific nature of compute ( ) will be determined by what type of conversion is taking place.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 6:**

Imagine a publishing company which does marketing for book and audiocassette versions. Create a class publication that stores the title (a string) and price (type float) of a publication. From this class derive two classes: book, which adds a page count (type int), and tape, which adds a playing time in minutes (type float). Write a program that instantiates the book and tape classes, allows user to enter data and displays the data members. If an exception is caught, replace all the data member values with zero values.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 7:**

Create employee bio-data using following classes

- a) Personal record
- b) Professional record
- c) Academic record

Assume appropriate data members and member function to accept required data & print bio-data. Create bio-data using multiple inheritance using C++.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 8:**

Create a class template to represent a generic vector. Include following member functions:

- a) To create the vector.
- b) To modify the value of a given element
- c) To multiply by a scalar value
- d) To display the vector

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 9:**

Implement C++ program using command line arguments to search for a word in a file and replace it with the specified word. The usage of the program is shown below.

\$ change <old word> <new word> <file name>

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 10:**

Implement a function in C++ to count and display the number of lines **not starting with alphabet 'A'** present in a text file "STORY.TXT".

Example: If the file "STORY.TXT" contains the following lines,

The roses are red.

A girl is playing there.

There is a playground.

An Aeroplane is in the sky.

Numbers are not allowed in the password.

Then the output will be: The function should display the output as 3.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 11:**

Create User defined exception to check the following conditions and throw the exception if the criterion does not meet.

- a) User has age between 18 and 55
- b) User stays has income between Rs. 50,000 – Rs. 1,00,000 per month
- c) User stays in Pune/ Mumbai/ Bangalore / Chennai
- d) User has 4-wheeler

Accept age, Income, City, Vehicle from the user and check for the conditions mentioned above. If any of the condition not met then throw the exception.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 12:**

Implement a menu driven program that will create a data file containing the list of telephone numbers in the following form

John 23456

Ahmed 9876

.....

Use a class object to store each set of data, access the file created and implement the following tasks

- a) Create Record
- b) Display All Records
- c) Determine the telephone number of specified person
- d) Determine the name if telephone number is known
- e) Update the telephone number, whenever there is a change.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 13:**

Write a function template selection Sort. Write a program that inputs, sorts and outputs an integer array and a float array.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 14:**

Implement a function in C++ to count and display the number of lines **not starting with alphabet 'A'** present in a text file "STORY.TXT".

Example: If the file "STORY.TXT" contains the following lines,

The roses are red.

A girl is playing there.

There is a playground.

An Aeroplane is in the sky.

Numbers are not allowed in the password.

Then the output will be: The function should display the output as 3.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 15:**

Implement Program which will create a Linked List using STL and perform following operations:

- |   |                                  |
|---|----------------------------------|
| 1) Insert Element at the Front          | 6) Multiply with Scalar value    |
| 2) Insert Element at the End            | 7) Reverse the order of elements |
| 3) Delete Element at the Front          | 8) Sort Forward List             |
| 4) Delete Element at the End            | 9) Merge Sorted Lists            |
| 5) Remove Elements with Specific Values | 10) Display Forward List         |

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 16:**

Implement C++ program using STL to add binary numbers (assume one bit as one number); use STL stack.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statements 17:**

- Demonstration of command line arguments for renaming of a file name.
- Program for Decimal to Binary Conversion using STL Stack

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 18:**

Program using STL for Sorting and searching with user-defined records:

Person Record (Name, birth date, telephone no)

- Insert & Sort Person
- Search Person By Name
- Search Person By Date of Birth
- Search Person By Telephone Number
- Display All Persons

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 19:**

Program using STL for Sorting and searching with user-defined records:

Item record (item code, item name, quantity and cost)

- a) Insert & Sort Item
- b) Search Person By Item Name
- c) Search Person By Item code
- d) Search Person By Item Cost
- e) Display All Items

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 20:**

Program using STL for Sorting and Result Calculation with user-defined records:

Election Record (voter name, voter id, voter age, vote)

- a) New Voting
- b) Display All Voters List
- c) Display Result

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 21:**

Program using STL for Sorting and Hotel Bill Calculation with user-defined records:

Hotel Bill Calculation record (items [], customer name, total amount, table no)

- a) Place New Order
- b) Display All Orders
- c) Search By Table Number
- d) Search By Customer Name

Item Name	Amount
Pepsi	15
Noodles	20
Pizza	58
Tea	5
Coffee	12

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 22:**

Program using STL for Sorting & Reservation Bill Calculation with user-defined records: Bus Reservation

Record (Seat no, passenger name, distance travel, bill)

- a) New Reservation
- b) Display All Reservation
- c) Search By Seat Number
- d) Search By Passenger Name

Distance Range	Rate Per KM
0-100	2
101-200	3
201-300	4
301 and above	5

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 23:**

Implement C++ program using STL to add binary numbers (assume one bit as one number); use STL stack.

**Roll No:** \_\_\_\_\_ **Name:** \_\_\_\_\_ **PRN No:** \_\_\_\_\_

**Problem Statement 24:**

- a) Demonstration of command line arguments for renaming of a file name.
- b) Program for Decimal to Binary Conversion using STL Stack