

Name

Roll Number:

CS 200 Introduction To Programming
Fall 2022-2023
Lab

Pre-Lab # 3

Task 1 - [60 Marks]

A set is a collection of distinct elements. In this task, you are required to create a class "Set". The class should have two data members:

- int *set;
- int length;

Implement the following methods of the class:

1. Default constructor
 - Set pointer to NULL
 - Set length to zero
2. A constructor that takes an array and its size
 - The array may contain repeated elements. Allocate memory to "set". Copy the array to the variable "set". The method should copy the distinct elements from the array to the data member "set".
 - Set the "length" of the set
 - Ordering inside array does not matter {1,2} and {2,1} are equal sets.
3. Union
 - Receives a reference to another class object Set in the variable s2.
 - Create another object of the Set class that stores union and allocate memory to the pointer "set".
 - Takes union of current object with s2
 - Returns Union of the two sets as a type Set.
 - Make sure the union contains distinct elements.
 - Ordering inside array does not matter {1,2} and {2,1} are equal sets.
4. Intersection
 - Similar to Union, except it returns intersection as a Set.
5. Difference
 - Similar to Union and Intersection, except it returns the difference between THE current object and the object passed as a parameter.
6. Compare
 - Returns true if the current object is equal to the object that is passed as a parameter
 - Returns false otherwise
 - Ordering inside array does not matter {1,2} and {2,1} are equal sets.

7. A destructor

- Deallocate the memory pointed to by the variable “set”.

You are welcome to create as many private functions as required for some internal processing. Write the main function to test the functionality of all the methods.

Task 2 - [40 Marks]

Create a class “BankAccount” with the following members:

- First name of the customer:
- The second name of the customer
- Account number
- Account type
- Balance

An account can be of two types basic account and a current account. A current account holder must maintain a balance of PKR 50000.

Implement the following methods in the class:

- A constructor that takes values for the four members
 - Check the initial balance if it is greater than or equal to 50000 for a current account. If not, the account should be opened as a basic account, even if a current account is requested.
- Perform a transaction such as deposit and withdrawal
 - Change the account type to basic account if the balance gets below 50000. But a basic account should remain a basic account even if the balance exceeds 50000.
- Change account type
 - Check the balance to change from basic to current.
- Change name
- GetFirstName
- GetLastName
- GetBallance
- GetAccountNumber
- GetAccountType

The names of the methods are self-explanatory. Decide appropriate parameter types and the signatures of the methods. In the main function, create four class objects, customer1, customer2, customer3, and customer4 and check different use cases. Receive the values using get functions and print the formation.