

## Assignment #1

Applied Programming, Fall 2019

Date assigned: 3-10-2019

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### Question 1

**Define a class to represent a bank account. Include the following members:**

Private Data members:

1. Name of the account holder. (45-character string)
2. Account number. (integer)
3. Type of account. (25-character string)
4. Balance amount in the account. (double)

Public Member functions:

Following four member functions services need to be present in the

**Function 1.** A class member function to open the account (e.g., OpenAccount() ):

This function will need to display following information to the customer:

“Customer have to pay Rs. 1000 to open his account

Customer needs to maintain at least Rs. 1000 to keep his account active

Do you like to open an account?

If Yes enter 1

If No enter 0”

If customer enters 0, this function does nothing, but if the customer presses, 1 this function initializes Balance to Rs.1000, and further questions to the customer:

Enter name, account number & account type(current or savings) to open account :

Hence it will also initialize the above-mentioned private members of the class.

**Function 2.** A class member function to deposit an amount.

This function takes a float value as input parameter, and adds the passed value to balance.

**Function 3.** A class member function to withdraw an amount after checking the balance.

If the user has entered the amount to withdraw which is less than the account balance, it will subtract the amount withdrawn from the balance, otherwise it will prompt:

Sorry your balance is not sufficient to withdraw Rs. \_\_\_\_\_ Amount.

You have to maintain at least Rs. 1000 to keep your account active.

**Function 4.** A class member function to display the name and balance.

This function's service is used to display the name, Account type and balance in the following format:

The account details are:

=====

Name: Kashif

Account type: current

Balance: Rs. 1300

**Testing the Main program:**

write the main program to test the class as follows:

1. instantiate a bank account

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2. Open the customer's account
3. If he prompts 1 for account opening then do following:
  - 3.a Ask the customer's choice if he wants to deposit any amount
  - 3.a Ask the customer's choice if he wants to withdraw any amount
4. If he prompts 0 for account opening in step 2, then display a message:  
"Thank you ,see again"

### Question 2

*(Complex Class)* Create a class called `Complex` for performing arithmetic with complex numbers. Write a program to test your class. Complex numbers have the form

$$\text{realPart} + \text{imaginaryPart} * i$$

where  $i$  is

$$\sqrt{-1}$$

Use double variables to represent the private data of the class. Provide a constructor that enables an object of this class to be initialized when it's declared. The constructor should contain default values in case no initializers are provided. Provide public member functions that perform the following tasks:

- a) Adding two Complex numbers: The real parts are added together and the imaginary parts are added together.
- b) Subtracting two Complex numbers: The real part of the right operand is subtracted from the real part of the left operand, and the imaginary part of the right operand is subtracted from the imaginary part of the left operand.
- c) Printing Complex numbers in the form  $(a, b)$ , where  $a$  is the real part and  $b$  is the imaginary part.

### Question 3

*(Rational Class)* Create a class called `Rational` for performing arithmetic with fractions.

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Write a program to test your class. Use integer variables to represent the private data of the class—the numerator and the denominator. Provide a constructor that enables an object of this class to be initialized when it's declared. The constructor should contain default values in case no initializers are provided and should store the fraction in reduced form. For example, the fraction

$$\frac{2}{4}$$

would be stored in the object as 1 in the numerator and 2 in the denominator. Provide public member functions that perform each of the following tasks:

- a) Adding two Rational numbers. The result should be stored in reduced form.
- b) Subtracting two Rational numbers. The result should be stored in reduced form.
- c) Multiplying two Rational numbers. The result should be stored in reduced form.
- d) Dividing two Rational numbers. The result should be stored in reduced form.
- e) Printing Rational numbers in the form a/b, where a is the numerator and b is the denominator.
- f) Printing Rational numbers in floating-point format.

### Note:

1. Last date of submission is **October 10, 2019 - 10 AM (sharp)**
2. Assignments will not be accepted after due date.
3. Plagiarism, if detected, will result in zero marks.
4. Submit code of each program in a separate directory. Zip all the files and name the zip file as: Rollnumber\_StudentName\_SectionA.zip
5. Assignment must be submitted on slate only.
6. If you fail to submit the assignment on time, you may not be able to do it later on. Do not submit assignment on 11<sup>th</sup> hour, if in case connection is dropped you won't be able to submit it again. Assignment submission on emails after passing the due date and time is not allowed.
7. If you upload the empty or corrupted archive, you will get zero marks. Hence double check before uploading.