

Week 4: Constructor, Destructor, Default parameters

Learning Materials: Chapter 6

Task 1

Create a simple **"Calculator"** class. This class holds a field/variable that represents a current integer value and few methods (mentioned below) allow the user to perform basic arithmetic operations on that value. Write a **constructor** that assigns initial value to the field 0. Also write an **overloaded constructor** that assign an initial value Calculator(int val)

List of methods of Class Calculator:

- Calculator();
- Calculator(int val);
- int getValue();
- void setValue();
- void add(int Value);
- void subtract(int Value);
- void multiply(int Value);
- void divideBy(int Value);
- void clear();
- void display();
- ~Calculator();

Sample Input Output:

```
-----
add 10
Calculator display: 10
-----
add 7
Calculator display: 17
-----
multiply 31
Calculator display: 527
-----
subtract 42
Calculator display: 485
-----
```

```

divide by 7
Calculator display: 69
-----
divide by 0
Error : divide by 0 is undefined.
Calculator display: 69
-----
add 3
Calculator display: 72
-----
subtract 1
Calculator display: 71
-----
clear
Calculator display: 0
Calculator object is destroyed.

```

Task 2

Define a class "**BankAccount**" with the following description.
Each account will have the following information.

Private members

- The account number.
- The account holder name.
- The account type (Current/ Savings) (assume the data type)
- The current balance.
- The minimum balance (An account has to maintain Minimum Amount, cannot withdraw)

The class will have the following criteria.

Public members

- The member variables value of the object can be assigned **during** object **creation** or **after** the object has been created.
- A function to show all the information of a **BankAccount** object.
- Function **showBalance()** (for displaying current balance),
- Functions **deposit()** and **withdrawal()** of money from an account. Show appropriate messages for invalid amount.
- Function **giveInterest()** will **deposit** net interest to the account. Default interest is **2.5 percent** of current balance but it might be different. A fixed **10%** Source Tax will be deducted from the incurred interest.

- When the **BankAccount** object is destroyed display a message like
: *Account of Mr. X with account no 1234 is destroyed with a balance BDT 5000*

Task 3

You are asked to create a class "**ZooAnimal**" that matches the following criteria:

Private members:

- `nameOfAnimal` : character string
- `birthYear` : integer
- `cageNumber` : integer
- `weight` : float
- `height` : integer

Public members:

- A **constructor** that assigns default values to the private members.
- Create **setter** and **getter** methods for all the private members separately. Use **2021** as `birthYear` at the time of setting if no argument is passed. Note that `birthYear` cannot be greater than 2021.
- Create a **getAge()** method to get the age of the animal.
- Create a **getInformation()** method to get the overall information of a **ZooAnimal**.