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(int val);
- 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 in C++ with following description:

Private Members:

- A data member Flight number of type integer
- A data member Destination of type string
- A data member Distance of type float
- A data member MaxFuelCapacity of type float
- A member function double CalFuel() to **return** the value of Fuel required for current Distance value as per the following criteria

Distance	Fuel
<=1000	500
more than 1000 and <=2000	1100
more than 2000	2200

Public Members:

A function **FeedInfo()** to allow user to take input from keyboard for Flight Number, Destination, Distance, MaxFuelCapacity.
A function **ShowInfo**() to allow the user to view the content of all the data members. At the end it will also show appropriate messages like "Fuel Capacity is fit for this flight distance" or "Not sufficient Fuel Capacity for this flight".

Task 3

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 **BankAcccout** object.
- Function **showBalance() (**for displaying current balance**),**
- Functions **deposit()** and **withdrawal()** of money from an account. Show appropriate messages for **invalid** amount. Example: negative amount cannot be deposited or withdrawal.
- Function **giveInterst()** will deposit net interest to the account. Default interest is **3 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 4

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

Private members:

- nameOfAnimal : character string (Default: “”)
- birthYear : integer (Default: 2023)
- cageNumber : integer (Default: 0)
- weight : float (Default: 1)
- height : integer (Default: 1)

Public members:

- A constructor with parameter list to assign initial values of the member variables. Use default variable if the argument is not present.
- Create **setter** and **getter** methods for all the private members separately. At the setter method add necessary checking.
- Create a **getAge()** method to get the age of the animal.
- Create a **displayInfo()** method to print all information of a **ZooAnimal**.
- A Destructor that displays the information of the ZooAnimal()