EC 2010 : Computer Programming

Lab 05

MALHARA R.M.Y.S

2022/E/126

EC2010

2023/11/30

01)

Task 01

Code:

```
// MALHARA R.M.Y.S
// 2022/E/126
// EC2010
// Group: C
// Lab: 05
// Program Description: Q1 Task01
// Certificate of Authenticity:
// I certify that the code in the method function main of this project
// is entirely my own work.

#include <iostream>
using namespace std;

class Book{
public:
   string pages;
private:
   string title,author;

public:
   void displayPages(){
   cout<<"Number of Pages = "<<pages<<endl;
   }
public:
   void displayTitle(string t){
   title=t;
   cout<<"Book Title = "<<title<<endl;
   }
public:
   void displayAuthor(string t, string a){
   title=t;
   author=a;
   cout<<title<<" was written by "<<author<<endl;
   }

};

int main(){
   Book obj1;

   cout<<"Enter number of pages: ";
   cin>>obj1.pages;

   string authorinput;
   cout<<"Enter the author name: ";
   cin>>authorinput;
```

```
    string titleinput;
    cout<<"Enter the book title: ";
    cin>>titleinput;

    obj1.displayTitle(titleinput);
    obj1.displayAuthor(titleinput,authorinput);
    obj1.displayPages();

    return 0;


}
```

Output :

```
Enter number of pages: 7
Enter the author name: sasindu malhara
Enter the book title: Book Title = malhara
malhara was written by sasindu
Number of Pages = 7
```

Task 02

Code :

```
// MALHARA R.M.Y.S
// 2022/E/126
// EC2010
//Group: C
// Lab: 05
// Program Description: Q1 Task02
// Certificate of Authenticity:
// I certify that the code in the method function main of this project
// is entirely my own work.

#include <iostream>
using namespace std;

class WaterTank {
private:
    double capacity;
    double currentWaterLevel;

public:
    void initialize(double tankHeight, double tankRadius) {
        capacity = ((22* tankRadius * tankRadius * tankHeight)/7)*1000;
    }
```

```
    double getCapacity() {
        return capacity;

    }

    void setWaterlevel (double currentWaterLevel){
        this->currentWaterLevel=currentWaterLevel;
    }

    double fill(double fillAmount) {
         if (currentWaterLevel + fillAmount <= capacity) {
            currentWaterLevel+= fillAmount;
         } else {
            cout << "Tank can't be overfilled." << endl;
         }
         return currentWaterLevel;
    }

    double drain(double drainAmount) {
        if (currentWaterLevel >= drainAmount) {
            currentWaterLevel -= drainAmount;
        } else {
            cout << "Not enough water to drain." << endl;
        }
        return currentWaterLevel;
    }

    double getCurrentWaterLevel() {
        return currentWaterLevel;
    }

};

int main(){
    WaterTank tank;
    double tankHeight, tankRadius, currentWaterLevel;
    cout << "Enter the height (in meter) of the water tank: ";
    cin >> tankHeight;
    cout << "Enter the radius (in meter) of the water tank: ";
    cin >> tankRadius;
    tank.initialize(tankHeight, tankRadius);
    cout << "Tank capacity: " << tank.getCapacity() << "liters." << endl;
    cout << "Enter the current water level (in liters): ";
    cin >> currentWaterLevel;
    tank.setWaterlevel(currentWaterLevel);
    double fillAmount;
    cout << "Enter the amount to fill (in liters): ";
    cin >>fillAmount;
    tank.fill(fillAmount);
    cout << "Current water level: " << tank.getCurrentWaterLevel() << "liters." << endl;
    double drainAmount;
    cout << "Enter the amount to drain(in liters): ";
    cin >> drainAmount;
```

```
    tank.drain(drainAmount);
    cout << "Current water level: " << tank.getCurrentWaterLevel () << "liters." << endl;
return 0;
}
```

Output :

```
Enter the height (in meter) of the water tank: 50
Enter the radius (in meter) of the water tank: 10
Tank capacity: 1.57143e+007liters.
Enter the current water level (in liters): 10000
Enter the amount to fill (in liters): 5000
Current water level: 15000liters.
Enter the amount to drain(in liters): 4000
Current water level: 11000liters.
```

02)

Code :

```
// MALHARA R.M.Y.S
// 2022/E/126
// EC2010
// Group: C
// Lab: 05
// Program Description: fibonacciIterative
// Certificate of Authenticity:
// I certify that the code in the method function main of this project
// is entirely my own work.


#include<iostream>
using namespace std;

int fibonacciIterative(int n) {
    if(n <= 1)
        return n;
    int fib = 1;
    int prevFib = 1;

    for(int i = 2; i < n; ++i) {
        int temp = fib;
        fib += prevFib;
        prevFib = temp;
    }
    return fib;
}
```

```
int main() {
   int n;
   cout << "Enter a positive integer: ";
   cin >> n;
   cout << "Fibonacci number is: " << fibonacciIterative(n);
   return 0;
}
```

```
// MALHARA R.M.Y.S
// 2022/E/126
// EC2010
// Group: C
// Lab: 05
// Program Description: fibonacciRecursive
// Certificate of Authenticity:
// I certify that the code in the method function main of this project
// is entirely my own work.


#include<iostream>
using namespace std;

int fibonacciRecursive(int n) {
   if(n <= 1)
      return n;
   else
      return fibonacciRecursive(n - 1) + fibonacciRecursive(n - 2);
}

int main() {
   int n;
   cout << "Enter a positive integer: ";
   cin >> n;
   cout << "Fibonacci number is: " << fibonacciRecursive(n);
   return 0;
}
```

03)

```
// MALHARA R.M.Y.S
// 2022/E/126
// EC2010
// Group: C
// Lab: 05
// Program Description: TriangleNumber
// Certificate of Authenticity:
// I certify that the code in the method function main of this project
// is entirely my own work.


#include <iostream>
using namespace std;

bool isTriangleNumber(int num, int n = 1) {
   if(num == 0)
      return true;
   else if(num < 0)
      return false;
   else
      return isTriangleNumber(num - n, n + 1);
}

int main() {
   int num;
   cout << "Enter a number: ";
   cin >> num;
   if(isTriangleNumber(num))
      cout << num << " is a triangle number.";
   else
      cout << num << " is not a triangle number.";
   return 0;
}
```