

# MINOR ASSIGNMENT-01

## Game Programming with C++ (CSE 3545)

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**Publish on:** 28-02-2024

**Course Outcome:** CO<sub>1</sub>

**Program Outcome:** PO<sub>5</sub>

**Submission on:** 08-03-2024

**Learning Level:** L<sub>5</sub>

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### Problem Statement:

**Write, compile and execute** simple C++ programs to solve computational problems.

### Assignment Objectives:

To learn about OOP concepts in C++ and get the idea of how they can be used to solve computational problem.

### Answer the followings:

1. Consider the following program;

```
#include <iostream>
using namespace std;
void swap (int &a, int &b) {
    int temp; temp = a;
    a = b;
    b = temp; }
int main () {
    int i = 0, j = 1;
    swap (i, j);
    cout << i << " " << j << endl;
}
```

What is the output of the above program?

#### Output with explanation

2. Consider the following program;

```
#include <iostream>
using namespace std;
void myfun(int i, int &k) {
    i = 1;
    k = 2;
}
int main () {
    int x = 0;
    myfun (x, x);
    cout << x << endl;
    return 0;
}
```

What is the output of the above program?

#### Output with explanation

3. Consider the following program;

```
#include<iostream>
using namespace std;
int x = 1;
void fun(){
    int x = 2;
    {
        int x = 3;
        cout << ::x << endl;
    }
}
int main(){
    fun();
    return 0;
}
```

What is the output of the above program?

**Output with explanation**

4. Consider the following program;

```
#include<iostream>
using namespace std;

int x[100];
int main()
{
    cout << x[99] << endl;
}
```

What is the output of the above program?

**Output with explanation**

5. Consider the following program;

```
#include<iostream>
using namespace std;
void Cube(double &y) {
    y = y*y*y;
}
int main()
{
    double g = 4.0;
    Cube(g);
    cout << g<<endl;
    return(0);
}
```

What is the output of the above program?

**Output with explanation**

6. Consider the following program;

```
#include<iostream>
using namespace std;
class Sample {
public:
    Sample(int x = 10) {
        cout << "Value: " << x << endl;
    }
};
int main() {
    Sample obj;
    return 0;
}
```

What is the output of the above program?

**Output with explanation**

7. Consider the following program;

```
#include<iostream>
using namespace std;
class A {
public:
    A() { cout << "A "; }
    ~A() { cout << "~A "; }
};

void func() {
    static A obj;
}

int main() {
    func();
    func();
    cout << "Main ";
    return 0;
}
```

What is the output of the above program?

**Output with explanation**

8. Consider the following program;

```
#include <iostream>
using namespace std;
class MyClass{
public:
    ~MyClass() {
        cout<<"My destructor"<<endl;
    }
};

void main()
{
    MyClass obj;
    obj.~MyClass();
}
```

What is the output of the above program?

**Output with explanation**

9. Consider the following program;

```
#include<iostream>
#include<stdlib.h>
using namespace std;

class Test
{
public:
    Test()
    { cout << "Constructor called"; }
};

int main()
{
    Test *t = (Test *) malloc(sizeof(Test));
    return 0;
}
```

What is the output of the above program?

#### Output with explanation

10. Consider the following program;

```
#include<iostream>
using namespace std;

class Test
{
public:
    Test()
    { cout << "Constructor called"; }
};

int main()
{
    Test *t = new Test();
    return 0;
}
```

What is the output of the above program?

#### Output with explanation

11. In a company's payroll management system, tracking employee details and computing their annual income tax is crucial for financial planning and compliance. Develop a program that defines an **Employee** class to manage essential details such as name, age, profession, yearly salary, home address, and PAN number. The class should support both a default constructor and a parameterized constructor with default arguments. Implement two member functions: **calculateTax()**, which computes the employee's annual income tax based on predefined tax slabs, and **printTax()**, which displays the computed tax in a structured format as shown in the provided image. This program should help an HR manager automate tax calculations by entering employee details, ensuring accurate payroll processing and minimizing manual errors. The tax computation must follow the slab-based tax rules outlined in the given figure, ensuring correctness and compliance.

Sample Output▼

Name in Full : Satya Brata Rout			
Designation: Asst. Prof.			
Office address :			
AGE: 36			
PAN: XA0845QA			
For the Financial Year 2024-25 (A.Y. 2025-26)			
Gross Salary (Pay +GP+DA+HRA+ALLOWANCES) :			
Less:Standard Deduction u/s 16(ia)			
Total Income / Taxable income			
Rs. 1275000.00			
-Rs. 75000.00			
Rs. 1200000.00			
Calculation of Income Tax			
Income <= 300000.00 : NIL			
300000.00 <= Income < 700000.00 : 5% of income that exceed 300000.00			
700000.00 <= Income < 1000000.00 : 20000.00 + 10% of income that exceed 700000.00			
1000000.00 <= Income < 1200000.00 : 50000.00 + 15% of income that exceed 1000000.00			
1200000.00 <= Income < 1500000.00 : 80000.00 + 20% of income that exceed 1200000.00			
Income > 1500000.00 : 140000.00 + 30% of income that exceed 1500000.00			
Rs. 80000.00			
-Rs. 0.00			
Rebate Total Income less than Rs. 7 Lakhs.			
Total Tax			
Education & Health Cess @ 4% on Income Tax			
Add: Surcharge @ 10% (if income => 50 Lakhs)			
Add: Surcharge @ 15% (if income is more than => 1 Crore)			
Total tax payable			
Rs. 83200.00			

**Program and Output▼**

**Program and Output▼**

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