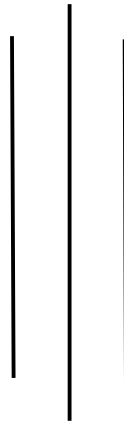


Object Oriented Programming Laboratory

Assignment – 4



Submitted By:

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CSE-34

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Question 1:

```
1 // Write a program to find the factorial of n natural numbers using default constructor.
2
3 #include<iostream>
4 using namespace std;
5
6 class factorial
7 {
8     int num;
9     int fact;
10 public:
11     factorial()
12     {
13         fact = 1;
14     }
15     void read_data(){
16         cout<<"Enter a number: ";
17         cin>>num;
18     }
19     void display()
20     {
21         cout<<"Factorial of "<<num<<" is "<<fact;
22     }
23     void calc();
24 };
25
```

```
26 void factorial::calc()
27 {
28     for(int i=1;i<=num;i++)
29     {
30         fact=fact*i;
31     }
32 }
33
34 int main()
35 {
36     factorial f;
37     f.read_data();
38     f.calc();
39     f.display();
40     return 0;
41 }
```

Output:

```
PS C:\Users\KIIT01\Desktop\programming> cd "c:\Users\KIIT01\Desktop\programming\OOP\13 october"
1_default_const }
Enter a number: 7
Factorial of 7 is 5040
PS C:\Users\KIIT01\Desktop\programming\OOP\13 october> █
```

Question 2:

```
1 // Write a program to find the sum of n natural numbers using parameterized constructor.
2
3 #include<iostream>
4 using namespace std;
5
6 class sum
7 {
8     int n;
9     int s;
10 public:
11     sum();
12     sum(int x)
13     {
14         s=x;
15     }
16     void get_data()
17     {
18         cout<<"Enter last number to add: ";
19         cin>>n;
20     }
21     void display()
22     {
23         cout<<"Sum of numbers is "<<s;
24     }
25     void calc();
26 };
```

```
27
28 void sum::calc()
29 {
30     for(int i=1;i<=n;i++)
31         s+=i;
32 }
33
34 int main()
35 {
36     int p;
37     cout<<"Enter a number to start: ";
38     cin>>p;
39     sum num(p);
40     num.get_data();
41     num.calc();
42     num.display();
43     return 0;
44 }
```

Output:

```
PS C:\Users\KIIT01\Desktop\programming> cd "c:\Users\KIIT01\Desktop\programming\OOP\13 october\" ;
ra_const }
Enter a number to start: 3
Enter last number to add: 5
Sum of numbers is 18
PS C:\Users\KIIT01\Desktop\programming\OOP\13 october> █
```

Question 3:

```
1 // Write a program to demonstrate a copy constructor.
2
3 #include<iostream>
4 using namespace std;
5
6 class Copy{
7     int a;
8     int b;
9     public:
10        Copy(){
11            cout<<"Default constructor invoked."<<endl;
12        }
13        Copy(int x,int y){
14            a=x;
15            b=y;
16            cout<<"\nparameterized const executed\n values are: ";
17            cout<<a<<" "<<b<<endl;
18        }
19        Copy(Copy &c){
20            a=c.a;
21            b=c.b;
22            cout<<"\ncopy const executed\n values are: ";
23            cout<<a<<" "<<b<<endl;
24        }
25        ~Copy(){
26            cout<<"\nDestructor invoked."<<endl;
27        }
28 };
29
30 int main(){
31     Copy c1;
32     Copy c2(10,20);
33     Copy c3(c2);
34     return 0;
35 }
36
```

Output:

```
PS C:\Users\KIIT01\Desktop\programming> cd "c:\Users\KIIT01\Desktop\programming\OOP\13 october\"
Default constructor invoked.

parameterized const executed
values are: 10 20

copy const executed
values are: 10 20

Destructor invoked.

Destructor invoked.

Destructor invoked.
PS C:\Users\KIIT01\Desktop\programming\OOP\13 october>
```

Question 4:

```
1  /* Write a program using single inheritance to calculate the grade of the students, use the
2     parent class person to read the name and use the child class to read three marks of the
3     student and display the grade. */
4
5  #include<iostream>
6  using namespace std;
7
8  class person
9  {
10     char name[20];
11     int roll;
12     public:
13     void get_data()
14     {
15         cout<<"Enter name: ";
16         cin>>name;
17         cout<<"Enter roll number: ";
18         cin>>roll;
19     }
20     void display_detail()
21     {
22         cout<<"Name: "<<name;
23         cout<<"Roll number: "<<roll;
24     }
25 };
26
```

```
27 class student: public person
28 {
29     int m1,m2,m3;
30     public:
31     void read_marks()
32     {
33         cout<<"Enter marks of three subjects: ";
34         cin>>m1>>m2>>m3;
35     }
36     void display()
37     {
38         cout<<"Marks: "<<m1<<" ", "<<m2<<" ", "<<m3<<endl;
39         cout<<"Grade: ";
40         int avg = (m1+m2+m3)/3;
41         if(avg>=90)
42             cout<<"O";
43         else if(avg>=80)
44             cout<<"E";
45         else if(avg>=70)
46             cout<<"A";
47         else if(avg>=60)
48             cout<<"B";
49         else if(avg>=50)
50             cout<<"C";
51         else
52             cout<<"F";
53     }
54 };
55
56 int main()
57 {
58     student s;
59     s.get_data();
60     s.read_marks();
61     s.display_detail();
62     s.display();
63     return 0;
64 }
```

Output:

```
PS C:\Users\KIIT01\Desktop\programming> cd "c:\Users\KIIT01\Desktop\programming\q4_inheritance" ; if ($?) { .\q4_inheritance }
Enter name: Yishap
Enter roll number: 21052960
Enter marks of three subjects: 78 86 81
Name: YishapRoll number: 21052960Marks: 78, 86, 81
Grade: E
PS C:\Users\KIIT01\Desktop\programming\OOP\13 october> |
```