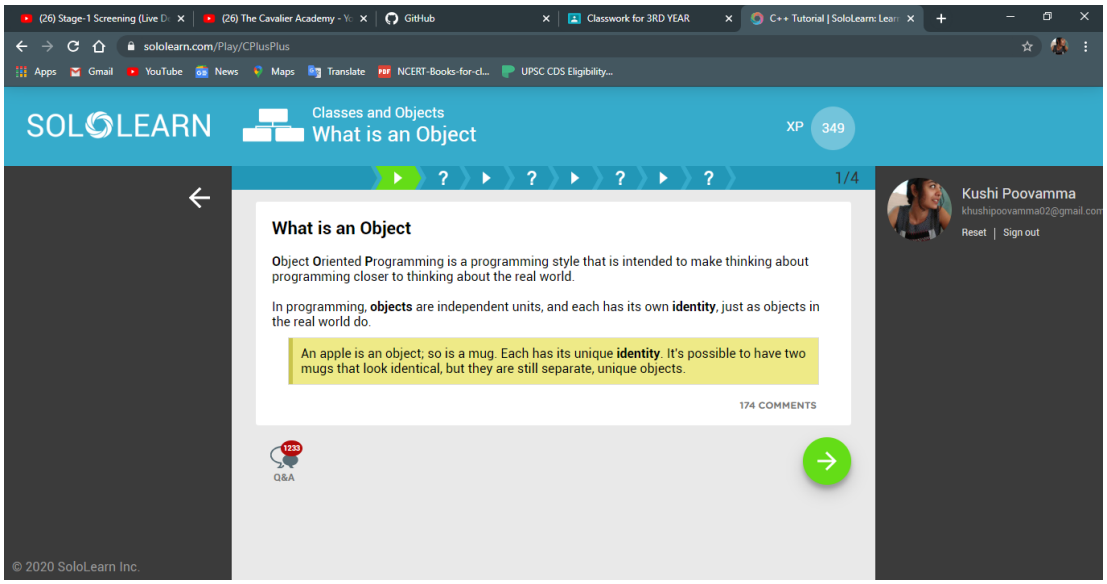
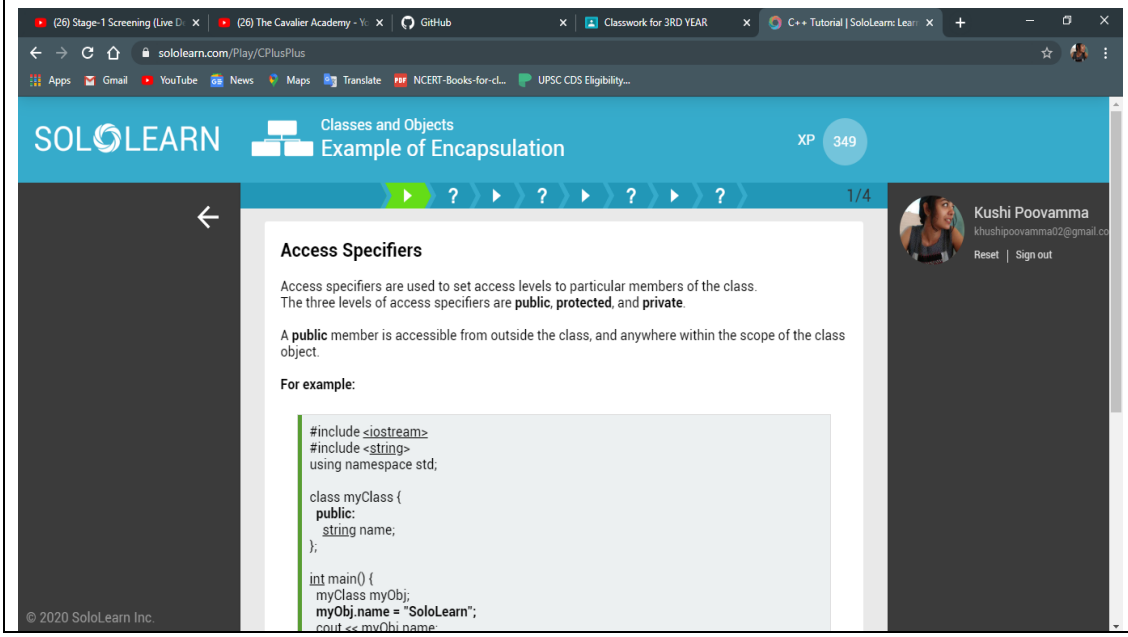
DAILY ASSESSMENT

Date:	**24-06-2020**	**Name:**	**K B KUSHI**
Course:	**C++ Programming**	**USN:**	**4AL17EC107**
Topic:	**Classes and Objects More on classes**	**Semester & Section:**	**6th & B**
GitHub Repository:	**https://www.github.com/alvas-education-foundation/KUSHI-COURSES.git**		

FORENOON SESSION DETAILS

Image of session





Report:

C++ Classes and Objects

Class: A class in C++ is the building block, that leads to Object-Oriented programming. It is a user-defined data type, which holds its own data members and member functions, which can be accessed and used by creating an instance of that class. A C++ class is like a blueprint for an object. For Example: Consider the Class of Cars. There may be many cars with different names and brand but all of them will share some common properties like all of them will have *4 wheels*, *Speed Limit*, *Mileage range* etc. So here, Car is the class and wheels, speed limits, mileage are their properties.

- **A Class is a user defined data-type which has data members and member functions.**
- **Data members are the data variables and member functions are the functions used to manipulate these variables and together these data members and member functions defines the properties and behavior of the objects in a Class.**
- **In the above example of class *Car*, the data member will be *speed limit*, *mileage* etc and member functions can be *apply brakes*, *increase speed* etc.**

An Object is an instance of a Class. When a class is defined, no memory is allocated but when it is instantiated (i.e. an object is created) memory is allocated.

Defining Class and Declaring Objects

A class is defined in C++ using keyword class followed by the name of class. The body of class is defined inside the curly brackets and terminated by a semicolon at the end.

Declaring Objects: When a class is defined, only the specification for the object is defined; no memory or storage is allocated. To use the data and access functions defined in the class, you need to create objects.

Syntax:

```
ClassName ObjectName;
```

Accessing data members and member functions: The data members and member functions of class can be accessed using the dot('.') operator with the object. For example if the name of object is *obj* and you want to access the member function with the name *printName()* then you will have to write *obj.printName()* .

Accessing Data Members

The public data members are also accessed in the same way given however the private data members are not allowed to be accessed directly by the object. Accessing a data member depends solely on the access control of that data member.

This access control is given by Access modifiers in C++. There are three access modifiers : public, private and protected.

filter_none

edit

play_arrow
brightness_4

```
// C++ program to demonstrate
// accessing of data members

#include <bits/stdc++.h>
using namespace std;
class Geeks
{
   // Access specifier
   public:

   // Data Members
   string geekname;

   // Member Functions()
   void printname()
   {
      cout << "Geekname is: " << geekname;
   }
};

int main() {

   // Declare an object of class geeks
   Geeks obj1;

   // accessing data member
   obj1.geekname = "Abhi";

   // accessing member function
   obj1.printname();
   return 0;
}
```

Output:

```
Geekname is: Abhi
```

Member Functions in Classes

There are 2 ways to define a member function:

- **Inside class definition**
- **Outside class definition**

Constructors

Constructors are special class members which are called by the compiler every time an object of that class is instantiated. Constructors have the same name as the class and may be defined inside or outside the class definition.

There are 3 types of constructors:

- **Default constructors**
- **Parametrized constructors**
- **Copy constructors**

filter_none
edit
play_arrow
brightness_4

```
// C++ program to demonstrate constructors

#include <bits/stdc++.h>
using namespace std;
class Geeks
{
   public:
   int id;

   //Default Constructor
   Geeks()
   {
      cout << "Default Constructor called" << endl;
      id=-1;
   }

   //Parametrized Constructor
   Geeks(int x)
   {
      cout << "Parametrized Constructor called" << endl;
      id=x;
   }
};
int main() {

   // obj1 will call Default Constructor
   Geeks obj1;
   cout << "Geek id is: " <<obj1.id << endl;

   // obj1 will call Parametrized Constructor
   Geeks obj2(21);
   cout << "Geek id is: " <<obj2.id << endl;
   return 0;
}
```

Output:

```
Default Constructor called

Geek id is: -1

Parametrized Constructor called
```

```
Geek id is: 21
```

A Copy Constructor creates a new object, which is exact copy of the existing object. The compiler provides a default Copy Constructor to all the classes.

Syntax:

```
class-name (class-name &){}
```

Destructors

Destructor is another special member function that is called by the compiler when the scope of the object ends.

filter_none
edit
play_arrow
brightness_4

```
// C++ program to explain destructors

#include <bits/stdc++.h>
using namespace std;
class Geeks
{
   public:
   int id;

   //Definition for Destructor
   ~Geeks()
   {
      cout << "Destructor called for id: " << id <<endl;
   }
};

int main()
 {
   Geeks obj1;
   obj1.id=7;
   int i = 0;
   while ( i < 5 )
   {
      Geeks obj2;
      obj2.id=i;
      i++;
   } // Scope for obj2 ends here

   return 0;
 } // Scope for obj1 ends here
```

Output:

```
Destructor called for id: 0
```

```
Destructor called for id: 1
Destructor called for id: 2
Destructor called for id: 3
Destructor called for id: 4
Destructor called for id: 7
```