C++ interview question answer

What is C++

C++ is an Object Oriented Programming Language. It was developed by Bjarne Stroustrup at AT & T's Bell Laboratories of USA in 1980.

What is OOP(Object oriented programming)

Implementation of program using object is term as OOP
in OOP we organize program through the use of Data Abstraction , Encapsulation , Data hiding , Inheritance , Polymorphism

Element of OOP

1. Object
2. Classes
3. Data abstraction and encapsulation
4. Inheritance
5. Polymorphism
6. Dynamic binding
7. Message passing

What is Class

Class is used to create user define data type. Class is a collection of member data and member function. Member data specifies the type of data to be stored. Member function acts as a mediator between user and data. Class implements encapsulation and abstraction.

What is object

In C++ , class variable are known as objects.

If **item** is a class then

item x create a variable x of type item . This class variable x known as object.

What is Data abstraction(showing essential feature**)**

Abstraction refer to the act of representing essential features without including the background details and explanation .

like car is a set of tens of thousands of individual parts abstraction allow people to drive car without knowing its complexity of parts

What is encapsulation(hiding the non essential feature**)**

The wrapping up of data and functions into a single unit (called class) is known as encapsulation.

hiding the non essential detail is term as encapsulation.

Example:

If i make a function(getdata) in class .Then in main function, i call the function getdata as.

Object .getdata();

then calling function is abstraction(act of giving essential detail) and function body is executed but we don't bother about what is written in function body , then function body is encapsulation(hiding non essential detail).

What is Inheritance

The mechanism of deriving a new class from the old one is called inheritance (or derivation).The old class is referred to as the base class and the new one is called the derived class.

What is Message passing

An object oriented program consist of set of objects that communicate with each other and communication among the object is done by message passing. Message passing involves specifying the name of object, the name of function, and information(argument) to be sent.

Object.function(argument)

What is Polymorphism(one name, multiple forms)

Polymorphism means the ability to take more than one forms

There are two types of polymorphism

1. Compile time polymorphism(overloading)
2. Run time polymorphism(overriding)

Compile time polymorphism is achieved with the help of Function overloading and Operator overloading.

Run time polymorphism is achieved with the help of Virtual function.

What is Function overloading

In Function Overloading we can create multiple functions with same function name but with different argument list.

What is Operator Overloading

The process of making an operator to exhibit different behaviors in different instances is known as operator overloading

for example asterisk(*) operator is used for multiplying and it is also used for pointer variable

plus(+) operator is used for addition and it is also used for incrementing any variable

What is Virtual function

When the function name and prototype is same in both the base and derived classes then on calling that function it always calls base class function. This introduce ambiguity .This problem can be solve by using virtual function . The function in the base class is declared as virtual by using virtual keyword. When a function is made virtual C++ determines which function to use at run time. Virtual function is used to achieve run time polymorphism.

What is data hiding

The insulation of data from direct access by the program is called data hiding .we can do it by making data private.

What is the difference between C and C++

1. C is Procedure Oriented Language(POP) while C++ is Object Oriented Language(OOP)
2.In C more emphasis is on Function while in C++ more emphasis is on Data
3.C++ support OOP concept like Data Abstraction , Encapsulation , Data hiding , Inheritance , Polymorphism while C does not
4.C follow top to bottom approach in program design while C++ follow bottom to top.

What is the difference between Structure and Class in C++

The only difference between Structure and Class in C++ is that, by default member of a class are private while by default member of a Structure are public

What is the difference between Structure in C and Class in C++

1.C does not allow the Structure data type to be treated like built-in types while class allow
2.C Structure does not allow data hiding while class allow

What is Friend function

A friend function is a function that although not a member of a class is able to access the private members of that class
(a non member function can not have access to the private data of a class but with the help of friend function it is possible to access private data of a class)

What is Abstract class

An Abstract class is one that is not used to create objects .An abstract class is designed only to act as a base class

What is Inline function

An Inline function is a function that is expanded in line when it is invoked .That is, the compiler replaces the function call with the corresponding function code(something similar to macro expansion)

What is the difference between Java and C++

1. Java is Platform independent language
   C++ is Platform dependent language
2. Java does not support operator overloading , multiple inheritance , inline function , friend function , Pointer , template , structure while C++ support
3. Java use compiler and interpreter , C++ use only compiler

What is Mutable keyword in C++

In C++ , by making a class object or a member function constant we can not modify their data member but we can modify their data member by declaring it mutable.

What is reference variable

A reference variable provides an alternative name for a previously defined variable. For example , if we make the variable **sum** a reference to the variable **total** , then **sum** and **total** can be used interchangeably to represent that variable.

```
float total = 100 ;
float & sum = total
```

sum and **total** refer to the same memory location

What is the difference between reference variable and pointer

1. A pointer when declared uses additional memory. On the other hand a reference variable can be assumed to be just another name given to an existing variable. Hence it requires no additional memory.

```
int a=10, *p
p = &a;     // p uses additional memory , and no such case with reference variable
```

2. A reference variable needs to be initialized when it is declared whereas no such case with pointers .

```
int *ptr;          // Works fine
int &b;            // Error
int &b = a;        // Works fine
```

3. A reference variable after initialization can not be re-initialized whereas no such case with pointers.

```
int a=10, b=20, *p;
p = &a;            // Fine.
p = &b;            // Fine.

int a=10,b=20
int &c=a;          // Fine
int &c=b           // Error
```

What is Virtual base class

When we use all three kinds of inheritance namely Multiple , Multilevel and Hierarchical inheritance. An ambiguity can arise when several paths exist to a class from the same base class. This means that a child class could have duplicate set of members inherited from a single base class.

This problem can be solve by using Virtual base class. When a class is made virtual ,necessary care is taken so that the duplication is avoided regardless of the number of paths that exist to the child class.

What is Constructor

Constructors are special member function used to initialize of user define data type in multiple form. It has same name as class name it does not have any return type not even void. It executed automatically whenever an object is created.

Number of constructor in a class is equal to the number of ways in which object can be created.

What is copy constructor

When a constructor accept a reference to its own class as a parameter. then the constructor is called the copy constructor.

A copy constructor is used to declare and initialize an object from another object.

Example

If integer is a class then

integer(integer &x);

This is copy constructor

integer I2(I1);

This statement whould define the object I2 and at the same time

initialize it to the values of I1.

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