1. **Difference between structure and class.**

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| **Structure** | **Class** |
| A structure can be referred to as a user defined data type possessing its own operations. | . A class in C++ can be defined as collection of related variables and function encapsulation in a single structure. |
| Structure member are public by default and it is value type function. | Class member are private by default and it is reference type function. |
| Its object is created on the stack memory. | Its object is created on the heap memory. |
| The member variable of structure cannot be initialized directly. | The member variable of class can be initialized directly. |

1. **What is friend function?**

**🡺** The protected and private data of a class can be accessed using the function.

1. **What is inline function?**

**🡺** Inline is a request not a command to the compiler to make a function as a inline function.

1. **What do you mean by abstraction in C++?**

**🡺** Abstraction is the process of showing the essential details to the user and hiding the details which we don’t want to show to the user or hiding the details which are irrelevant to a particular user.

1. **What is a reference in C++?**

**🡺**A reference is like a pointer. It is another name of an already existing variable. Once a reference name is initialized with a variable, that variable can be accessed by the variable name or reference name both.

1. **What is Exception Handling?**

**🡺** The process of converting system error messages into user friendly error message is known as exception handling.

* **throw**- when a program encounters a problem, it throws an exception. The throw keyword helps the program perform the throw.
* **catch**- a program uses an exception handler to catch an exception. It is added to the section of a program where you need to handle the problem. It's done using the catch keyword.
* **try**- the try block identifies the code block for which certain exceptions will be activated. It should be followed by one/more catch blocks.

**Types of Exceptions**

* **1.** Synchronous exceptions
* 2. Asynchronous exceptions

1. **What is static Memory Allocation?**

**🡺** When amount of memory to be allocated is known beforehand i.e. at the the time of compilation.

1. **What is Dynamic Memory allocation?**

**🡺** Dynamic memory allocation is when an executing program requests that the operating system give it a block of main memory.

It is a dynamic memory allocation function which is used to allocate the memory to complex data structures such as arrays and structures.

1. **What is inheritance?**

**🡺** Inheritance is a mechanism in which one class acquires the property of another class. Inheritance provides the idea of re-usability.

**There are three modes of inheritance as:**

**1. Public Inheritance**

**2. Private Inheritance**

**3. Protected Inheritance**

**Types of Inheritance**

In general inheritance is of five types:

**1. Single level inheritance** : In single level inheritance we have just one base class and one derived class

2**. Multilevel inheritance :** In multiple inheritances we have one base class and one derived at one level. At the next level the derived class becomes base class for the next class and so on

**3. Multiple inheritances :** In multiple inheritance a child can have more than parent.

**4. Hierarchical inheritance :** In this type of inheritance multiple classes share the same base class. That is number of classes inherits the properties of one common base class.

**5. Hybrid Inheritance :**

(a)All the public members of class A becomes public members of class B.

(b)All the protected members of class A becomes protected members of class B.

(c)Private members are never inherited.

1. **What is virtual base class?**

**🡺** Virtual base classes are used in virtual inheritance in a way of preventing multiple “instances” of a given class appearing in an inheritance hierarchy when using multiple inheritances.

1. **What is nesting of class in C++?**

**🡺** A **nested class** is a **class** that is declared in another **class**. The **nested class** is also a member variable of the enclosing **class** and has the same access rights as the other members.

1. **What is nesting member function in C++?**

**🡺** A **member function** can call another **member function** of the same class directly without using the dot operator.

1. **What is operator overloading?**

**🡺** Operator Overloading is a very essential element to perform the operations on user-defined data types. By operator overloading we can modify the default meaning to the operators like +, -, \*, /, <=, etc.

1. **What is Polymorphism?**

**🡺** Polymorphism in simple means having many forms. Its behavior is different in different situations. And this occurs when we have multiple classes that are related to each other by inheritance.

The two types of polymorphism in c++ are:

* **Compile Time Polymorphism**
* **Runtime Polymorphism**

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| * **Compile Time Polymorphism** | * **Runtime Polymorphism** |
| In this method, we would come to know at compile time which method will be called. And the call is resolved by the compiler. | In this method, we come to know at run time which method will be called. The call is not resolved by the compiler. |
| It provides fast execution because it is known at the compile time. | It provides slow execution compared to compile-time polymorphism because it is known at the run time. |
| It is achieved by function overloading and operator overloading. | It can be achieved by virtual functions and pointers. |

1. **What is Destructors?**

**🡺** A constructor is automatically called when an object is first created. Similarly when an object is destroyed a function called destructor automatically gets called. A destructor has the same name as the constructor (which is the same as the class name) but is preceded by a tilde.

1. **What is new operator?**

**🡺** New operator is used to allocate memory at runtime .

1. **What is delete operator?**

**🡺** Delete operator is used to deallocate the memory created by new operator at run-time.

### What do you mean by call by value and call by reference?

🡺 In call by value method, we pass a copy of the parameter is passed to the functions. For these copied values a new memory is assigned and changes made to these values do not reflect the variable in the main function.

In call by reference method, we pass the address of the variable and the address is used to access the actual argument used in the function call. So changes made in the parameter alter the passing argument.

### What are class and object in C++?

### 🡺 A class is a user-defined data type that has data members and member functions. Data members are the data variables and member functions are the functions that are used to perform operations on these variables.

### An object is an instance of a class. Since a class is a user-defined data type so an object can also be called a variable of that data type.

### What is Constructor in C++?

🡺 A **constructor** is a member function of a class which initializes objects of a class.

Constructor is a special function having same name as class name. The constructor is a member function that is executed automatically whenever an object is created.

**Types of Constructors**

1. **Default constructor** is the constructor which doesn’t take any argument. It has no parameters.
2. **parameterized constructors** are the constructors having a specific number of arguments to be passed.
3. **Copy Constructor** is a type of constructor which is used to create a copy of an already existing object of a class type.

### What is virtual function?

### 🡺 A virtual function is a member function in the base class that you redefine in a derived class. It is declared using the virtual keyword.

### What is pure virtual function?

### 🡺 A pure virtual function is a function that has no implementation and is declared by assigning 0. It has no body.

### What do you know about friend class and friend function?

### 🡺 A friend class can access private, protected, and public members of other classes in which it is declared as friends.

Like friend class, **friend function** can also access private, protected, and public members. But, Friend functions are not member functions.

### What are the C++ access specifiers?

🡺 There are three access specifiers :

**Public -** The members declared as Public are accessible from outside the Class through an object of the class.

**Protected -** The members declared as Protected are accessible from outside the class but only in a class derived from it.

**Private** - These members are only accessible from within the class.

### What are void pointers?

### 🡺 A void pointer is a pointer which is having no datatype associated with it. It can hold addresses of any type.

### What is this pointer in C++?

### 🡺 The member functions of every object have a pointer named this, which points to the object itself. The value of this is set to the address of the object for which it is called. It can be used to access the data in the object it points to.

### How do you allocate and deallocate memory in C++?

### 🡺 The new operator is used for memory allocation and deletes operator is used for memory deallocation in C++.

1. **What is the difference between a reference and a pointer?**

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| **Pointer** | **Reference** |
| A pointer can be initialized to any value anytime after it is declared. | A reference must be initialized when it is declared. |
| A pointer can be assigned to point to a NULL value. | References cannot be NULL. |
| A pointer can be changed to point to any variable of the same type. | Once a reference is initialized to a variable, it cannot be changed to refer to a variable object. |

1. **What is the difference between the local and global scope of a variable ?**

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| **Global Variable** | **Local Variable** |
| Global variables are declared outside all the function blocks. | Local Variables are declared within a function block. |
| The scope remains throughout the program | The scope is limited and remains within the function only in which they are declared. |
| A global variable exists in the program for the entire time the program is executed. | A local variable is created when the function is executed, and once the execution is finished, the variable is destroyed. |

1. **What is the difference between a++ and ++a?**

**🡺** **a++** refers to post-increment operation. The C++ compiler first uses the value of a and then increments it.

**++a** refers to the pre-increment operation. The C++ compiler first increments the value of a++ and then uses a.

1. **What is encapsulation?**

**🡺 encapsulation** is a method to hide the data in a single entity or unit along with a method to protect information from outside.

#### ****Define a namespace?****

#### 🡺 A namespace is a declarative region that provides a scope to the identifiers (names of the types, function, variables etc) inside it.

#### ****Why do we need the Friend class and function?****

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1. **What are the types of pointers?**

**🡺** **Different types of pointers are:**

·        **Null pointer**.

·        **Void pointer.**

·        **Wild pointer**.

·        **Dangling pointer**.

1. **What is function overriding? (Runtime polymorphism example)**

**🡺** When child class declares a method, which is already present in the parent class then this is called function overriding,

1. **what is the Difference between function overloading and function overriding.**

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| **Function overloading** | **Function overriding** |
| In function overloading we declare more than one function with different parameters. | In function overridding we declare a function in base class and derived class with the same name and parameters. |
| It is the example of compile time polymorphism. | It is the example of run time polymorphism. |

**38.What is function overriding.?**

**🡺** When child class declares a method, which is already present in the parent class then this is called function overriding,

1. **What is operator overloading?**

**🡺** Operator overloading is a compile-time polymorphism in which the operator is overloaded to provide the special meaning to the user-defined data type. Operator overloading is used to overload or redefines most of the operators available in C++.

**39. Constructor overloading :** Constructors can be overloaded in a similar way as function overloading. Overloaded constructors have the same name (name of the class) but the different number of arguments.

**40. What are different Input and output file streams?**

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**1. ofstream –** output file stream class to write on file

2**. ifstream** – input file stream class to read from file

3. **fstream** – file stream class to read and write to/from file.

41. **What are the different functions in file handling?**

**🡺** open( ) - To create a file

close( ) - To close an existing file

read( ) - To read data from file

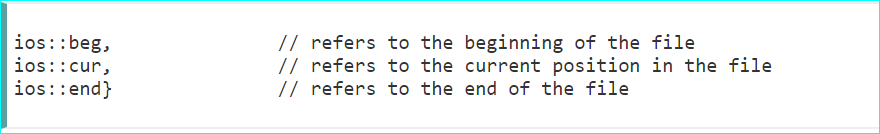
write( ) - To write data to file

**42.What is member function?**

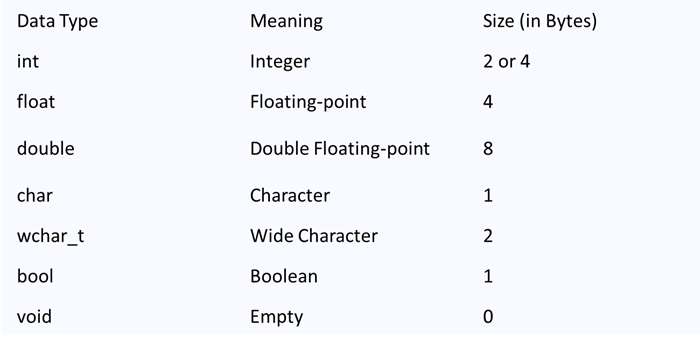
🡺A member function of a class is a function that has its definition or its prototype within the class definition like any other variable. It operates on any object of the class of which it is a member, and has access to all the members of a class for that object.

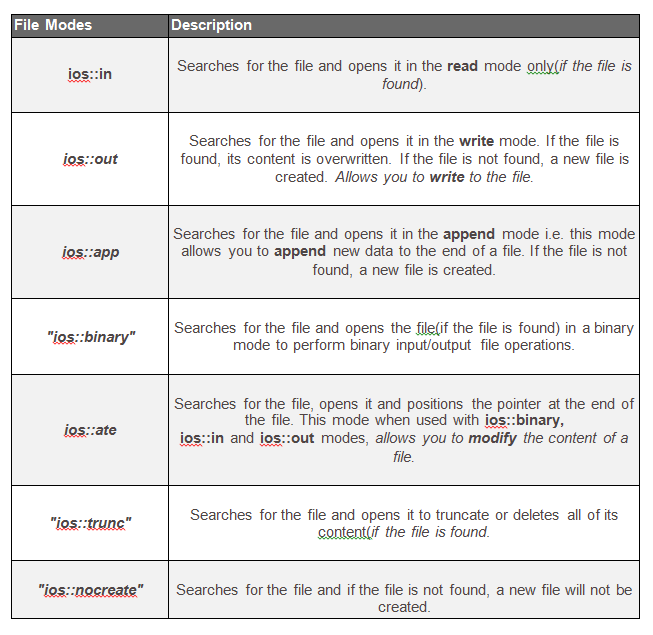
43. **What is SEEKG() ?**

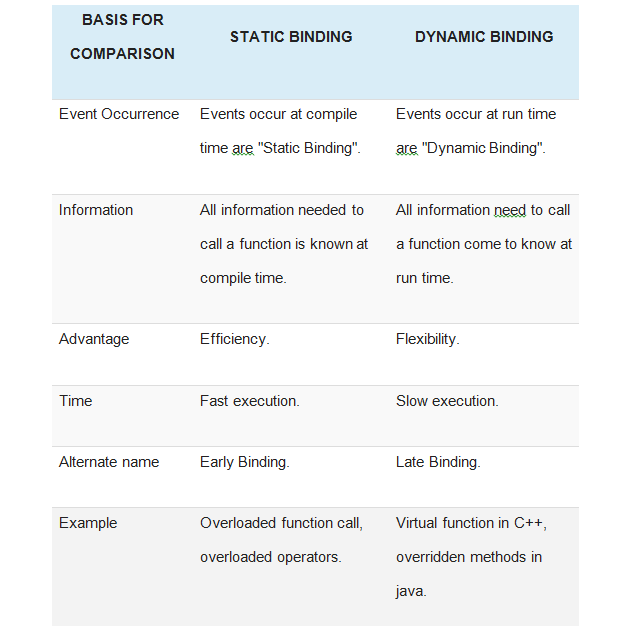
**🡺**Seekg() function allow us to move the Input pointer to specified location for reading purpose within the file.



#DATA Types

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