Agenda

- upcasting & downcasting
- object slicing
- function overriding
- virtual function
- pure virtual function
- abstract class

Upcasting & Downcasting (demo01)

- Keeping the object of derived class into base class pointer or reference is called as upcasting.
- Converting the base class pointer or reference into the derived class pointer or reference we call it as downcasting.
- At the time of downcasting explicit typecasting is mandatory

Object Slicing (demo01)

- When upcasting is done then the base class pointer or reference points only to the members of the dervied class that are inherited from the base class.
- It cannot point to the members given by the dervied class.
- this is called as object slicing.
- we can say that base class pointer points only to the base varient inside the derived class object

function overriding (demo02)

- Redefining the functions of base class once again inside the derived class with same name and signature is called as function overriding.
- Function overriding is done due to below reasons

1. When the implementation of base class function is 100% incomplete
2. When the implementation of the base class function is Partial complete
3. If we want the implementation of the dervied class function completely different from the base class function implementation.

Virtual functions (demo03)

- When upcasting and function overriding is done the base class pointer still points at the base class functions inherited into the derived class.
- It cannot point at the overriden functions given by the derived class.
- To call the overriden functions given by the derived class using base class pointer we should declare the base class functions as virtual.
- making these functions virtual will be having an effect of late binding.

pure virtual function (demo04)

- If the implementation of the base class funtion is not known and we want the derived class to compulsary implement these functions then we have to declare such functions as pure virtual in the

base class.
- To declare the functions as pure virtual we should declare the function as virtual and should assign the value 0 to it without providing any function body.

Abstarct class (demo04)

- The class in which pure virtual functions exists is called as abstract class.
- We cannot cretae object of this abstract class.
- We can create the pointer or reference of the abstract class.
- If these abstact classes are inherited into the derived classes then the derived classes should compulsary overide the pure virtual functions that are getting inherited.
- If the derived classes do not override these pure virtual functions then the dervied classes will also become the abstact class.

RTTI (Runtime Type Information)

- It consists of 3 elements

1. dynamic_cast operator
    - At the time of downcasting
    - It is used to check wether the downcasting is successful or not
2. typeid operator
    - It is used to get the information of the object
    - It return the information in the form of an object of typeinfo class
3. typeinfo class
    - It has got some members which help us to get the proper information regarding the object as per our need.