Agenda

- Constant
- Ctor members initializer list
- Static
- Reference
- Dynamic memory allocation
- Shallow copy & deep copy
- Copy ctor

Constant (demo01)

- We can make variables as constant
- We can make follwing as constant in c++

1. Variable
    - Once initialized we cannot change the value inside it.
2. Datamember
    - once the data member is initialized we cannot change the value inside it.
    - we cannot initialize the data members inside ctor body.
    - it is madatory to initialize the const data members inside ctor members initializer list.
    - If we want to modify the value of non const datamember inside const member functions then such data members must be declared as mutable.
3. Member function
    - If a member function is made as constant then we cannot modifiy the state of an object inside such member functions
4. Object
    - We can even make the object as constant.
    - if we make object as constant then such objects can call only const member functions from the class.

Ctor members initializer list

- It is a list that is used to initialize the data members of the class.
- As we can initialie the data member sinside the ctor body we can also initialize them inside ctor members initializer list.
- It is mostly used to initialize the const data members as they cannot be initialized inside ctor body.

Static (demo02)

- Static means sharing.
- In c++ we can make

1. Datamembers as static
    - satic datamembers are designed to be shared across multiple objects.
    - these datamembers gets space only once on data section.
    - these members must be initalized outside the class using classname and scoperesolution operator.

2. Member functions as static
    - They are designed to be called on classname using (::)
    - static member functions can access onlt static data members, they cannot access non static data members
    - static member functions do not get this pointer.

Reference (demo03)

- It is an alais for an existing memory location
- When you declare a reference it needs to be initialized immediately.
- You cannot declare a reference and later on assign it.
- once initialized we cannot change the reference to point at some other address
- we can also pass the arguments to the function by reference in cpp.

Dynamic memory allocation (demo04)

- In cpp to allcoate the memory dynamically use new operator
- In cpp to deallcoate the memory use delete operator
- once the memory is deallocated, the pointer points at random memory in heap section which does not exists.
- to avoid such dangling pointers,assign this pointers with NULL.

Shallowcopy, DeepCopy, Copy Ctor (demo05 and demo06)

- When we copy the objects then by default shallow copy is performed.
- shallow copy is also called as bitwise copy
- When we want to copy the objects by modifying some state inside them then we need to perform deep copy.
- Deep copy is also called as member wise copy.
- At the time of object creation if we initialize the object by copying it from differnt object then your copy ctor gets called.
- default copy ctor does the shallow copy.
- to perform deep copy we need to provide our own copy ctor.

Copy Ctor

- It is a single paramaterized ctor.
- It takes the paramater of same type as that of the class by refrence.
- It is used to perform deep copy