

Agenda

- reference to array
- Hierarchy and its type.
 - Association & Inheritance
- Types of Inheritance
- Mode of inheritance
- Diamond problem

reference to array (demo01.cpp)

Hierarchy

- has-a relationship (Association)
- is-a relationship (Inheritance)

Association (demo02 and demo05)

- when the relationship between two classes/entities is of type has-a then we use association.
- eg
 - Human has-a heart
 - Room has-a window
 - Employee has-a doj
- Dependent - Human
- Dependency - Heart
- Association is further classified into two types
 - 1. Composition
 - 2. Aggregation

Composition (demo03)

- If the relation between two entities is tightly coupled then we consider it as composition

Aggregation (demo04)

- If the relation between two entities is loosely coupled then we consider it as aggregation.

Inheritance

- when the relationship between two classes/entities is of type is-a then we use inheritance.
- eg

- circle is-a shape
- Mobile is-a device
- employee is-a person
- car is-a vehicle
- apple is-a fruit
- Shape -> Parent / Base class
- Circle -> Child / Derived class
- when inheritance is done the members of the base class gets inherited into the derived class.

Types of inheritance

- 1. single
- 2. multilevel
- 3. multiple
- 4. hierarchical
- 5. hybrid

Ctor calling sequence and protected access specifier(demo06)

Mode of Inheritance (demo07)

- default mode of inheritance is private
- 1. private
- 2. protected
- 3. public
- refer the ModeOfInheritance excel sheet.

Diamond problem

- When hierarchical and multiple inheritance gets combined we get a hybrid inheritance.
- Hybrid inheritance causes diamond problem.
- Indirect derived class get multiple inclusions of data members of indirect base class through its direct base classes.
- these inclusions create ambiguity and also waste memory.
- to avoid this ambiguity and save memory we have to make the base class as virtual.