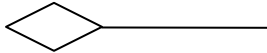# LAB # 14

## Aggregation
It indicates that the class having all the attributes of its own the instance of one class may include the instances of other class.

## Notation
It is denoted by a diamond symbol at the end of line towards the aggregated class.

## Composition
Composition implies on *Coincident Life time.*

### *Coincident Life time*
It means that when the Whole End of the Association is created the Part End is also created and when it is deleted the part end is also deleted.

## Multiplicity
If the lower bound of multiplicity is (1.. ) : it means that the Component should be created when the whole end is created and it will stay even if the whole end is deleted.
If the lower bound is (0.. ) : It means that the component has to be created at any time after the whole part is created and before the deletion of whole part.

## Shared Paths
When one or more association or composition shares same paths they can be drawn with a converging path with a shared aggregation or composition symbol.

## Generalization
It is described as the kind of relationship. In which one class is a kind of other class.
It is shown with a Arrow head to the class which is more general type.

## Features of Generalization

### Extending Class Properties:
This states that the sub class can inherit all the attributes and properties of the super class till the top class in the class hierarchy.

### Redefining Operations:
This states that the sub class inherits all the functions of the super class and redefines that function according to its own need.

### Placeholder Operations:
In this case the Super classes provide only the template to the sub class and sub class inherit that template of the function and use and define it according to its need.

### Bottom – Up Generalization
In this Generalization type all the common properties and attributes are assigned to the most super class in the class hierarchy and the sub classed inherit those properties from the super class.

### Top – Down Generalization
All the properties of the class are contained in the super class and analyst use generalization to access that property from super class to sub classes.

### Polymorphism
It is the ability of two operations with exactly same signature to perform same function in two different ways.

# *Lab Work and Assignment:*

### Q 5.5 A:   class diagram with generalization hierarchy