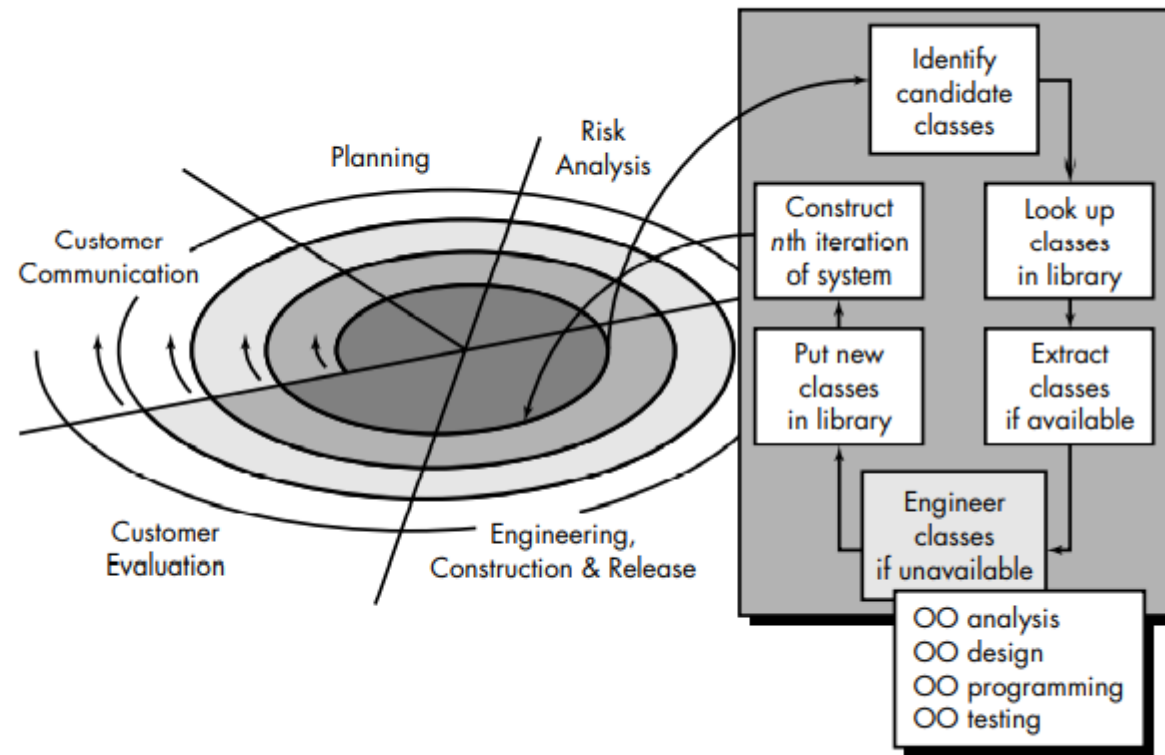


# CHAPTER 9

## **OBJECT-ORIENTED CONCEPTS AND PRINCIPLES**

# The OO Process model

**FIGURE 20.1**  
The OO  
process model



# OO Process model

- The OO process moves through an **evolutionary spiral** that starts with customer communication.
- .Planning and risk analysis establish a foundation for the OO project plan
- The technical work associated with OO software engineering follows the **iterative path** shown in the shaded box.
- OO software engineering emphasizes reuse.

# OO Process model

- Therefore, classes are “looked up” in a library (of existing OO classes) before they are built.
- When a class cannot be found in the library, the software engineer applies object-oriented analysis (OOA), object-oriented design (OOD), object-oriented programming (OOP), and object-oriented testing (OOT) to create the class and the objects derived from the class.
- The new class is then put into the library so that it may be reused in the future

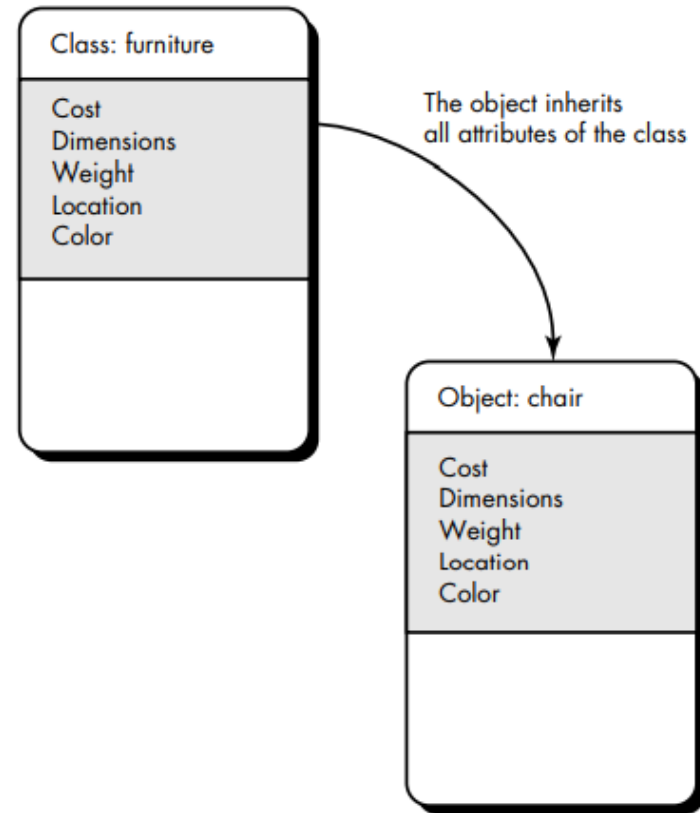
# Definition of Object and Class

- **Class** : A class is a generalized description that describes a collection of a similar objects.
- **Object** : Instance of Class is called object
- One widely used approach to problem solving takes an **object-oriented viewpoint**

# The Object Oriented Paradigm

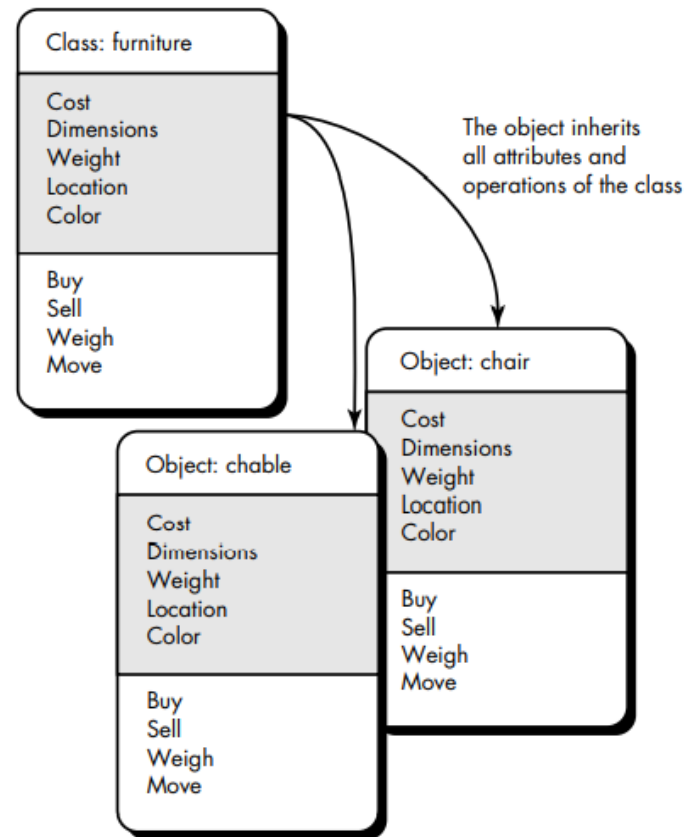
- For many years, the term object oriented (OO) was used to denote a **software development approach** that used one of a number of object-oriented programming languages Java, C++,
- Today, the OO paradigm encompasses a complete view of software engineering.

# Inheritance



1.2  
f  
o

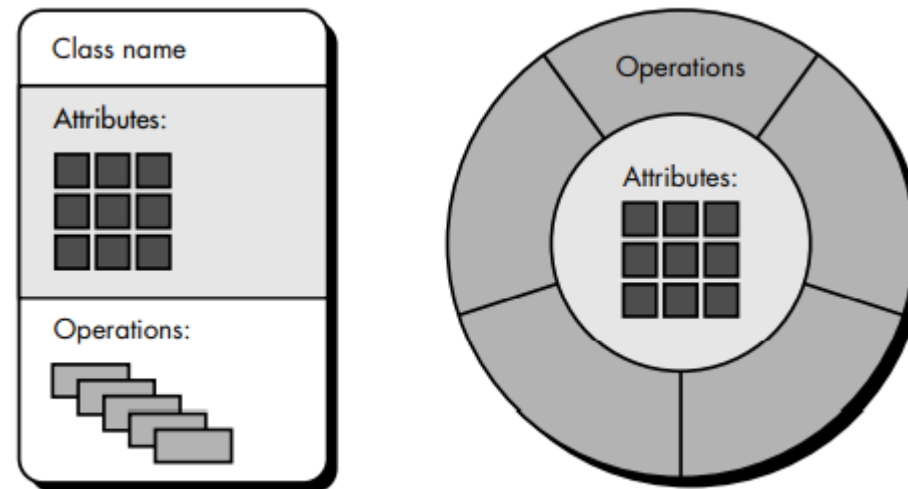
# Inheritance



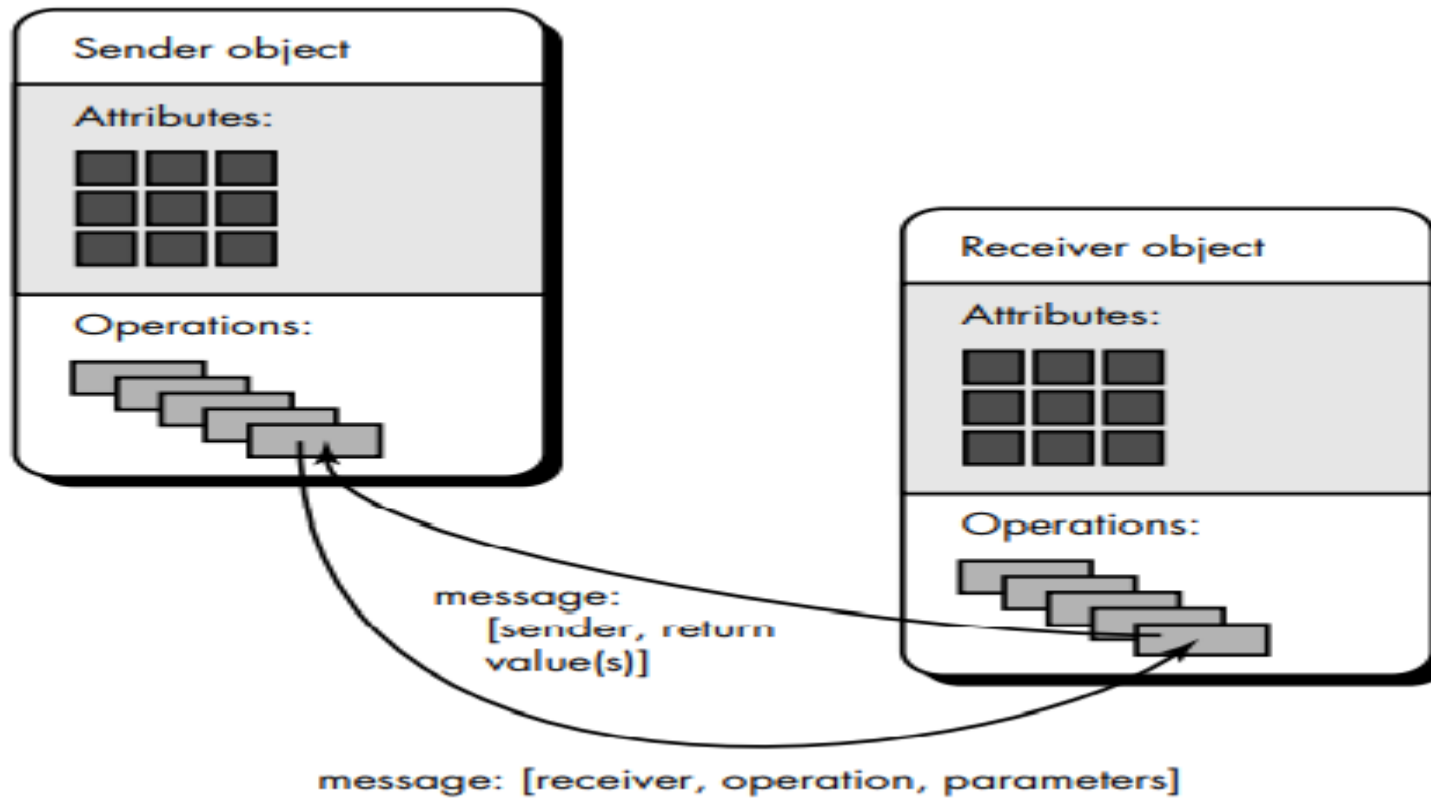


# Class and Object

An Alternative way to represent class and object



# Message Passing Between Class



# IDENTIFYING THE ELEMENTS OF AN OBJECT MODEL

## 1. Identifying Classes and Objects

**Objects can be:-**

- **External Entities**
- **Things**
  - **Occurrences or events**
- **Roles**
  - **Organizational units**
  - **Places**
- **Structure**

# IDENTIFYING THE ELEMENTS OF AN OBJECT MODE

## 2. Specifying Attributes

- Attributes are chosen by examining the problem statement, looking for things that fully define an object and make it unique.

# IDENTIFYING THE ELEMENTS OF AN OBJECT MODE

## 3. Defining the operation

Although many different types of operations exist, they can generally be divided into three broad categories:

- (1) operations that manipulate data in some way (e.g., adding, deleting, reformatting, selecting),
- (2) operations that perform a computation,
- (3) operations that monitor an object for the occurrence of a controlling event

# IDENTIFYING THE ELEMENTS OF AN OBJECT MODE

## **3. Finalizing the Object Definition**

The definition of operations is the last step in completing the specification of an object

# OO Project Metrics and Estimation

- Conventional software project estimation -- (LOC) and function points (FP)

OOP Project Metrics is based on:

- 1.Number of scenario scripts** (initiator, action and participator)
- 2.Number of key classes**
- 3.Number of support classes**
- 4.Average number of support classes per key class**
- 5.Number of subsystems.**