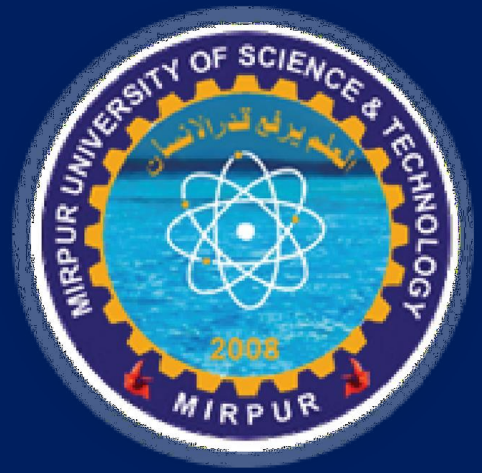


MUST

Wisdom & Virtue

MIRPUR UNIVERSITY OF SCIENCE AND TECHNOLOGY (MUST)
DEPARTMENT OF SOFTWARE ENGINEERING

Object Oriented Programming

Lecture 3: Introduction to Object in OOP

Engr. Saman Fatima
Lecturer
Email:
samanfatima.se@must.edu.pk

Last Lecture

- Introduction to Object Oriented Modeling
- What is a Model?
- Object-Orientation - Advantages

This Lecture

- What is an Object?
- How to identify Objects?
- Examples

What is an Object?

- An object is
  - Some thing Tangible(capable of being touched or felt)
  - E.g.

Real World Example	Software Based Example
• Car • Ali • House	• Teacher • Student • Course

Example

Car

- **Attributes:** Color, Model, Engine Power
- **Behaviors:** Drive, Stop, Turn

Mobile Phone

- **Attributes:** Brand, Battery Life, Screen Size
- **Behaviors:** Make Calls, Send Messages, Take Photos

Student

- **Attributes:** Name, Age, Roll Number
- **Behaviors:** Study, Take Exams, Mark Attendance

What is an Object?

- An object is
  - Something conceptual (Intangible)
  - That can be apprehended intellectually
  - E.g
    - Date
    - Time

Date (تاریخ)

- Represents a specific day, month, and year.
- Example: **"March 25, 2025"**

Time (وقت)

- Represents a point or duration in time.
- Example: **"10:30 AM"**

Bank Account

- Exists as a record in a system, not a physical object.
- Example: **"Account Number: 123456789"**

Online Order

- A digital transaction that represents a purchase.
- Example: **"Order #5678 – Status: Shipped"**

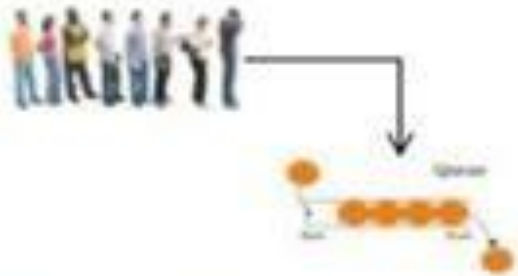
Tangible

- Physical existence can be felt or seen
- Example

Thinking Java
Bruce Eckel 300 pages ISBN 787887547 INR 6000
Open Close Display Discount

Conceptual

- Derived from tangible object
- Example



MyQueue
7 elements First : 16 Last : 20
Push Pop View

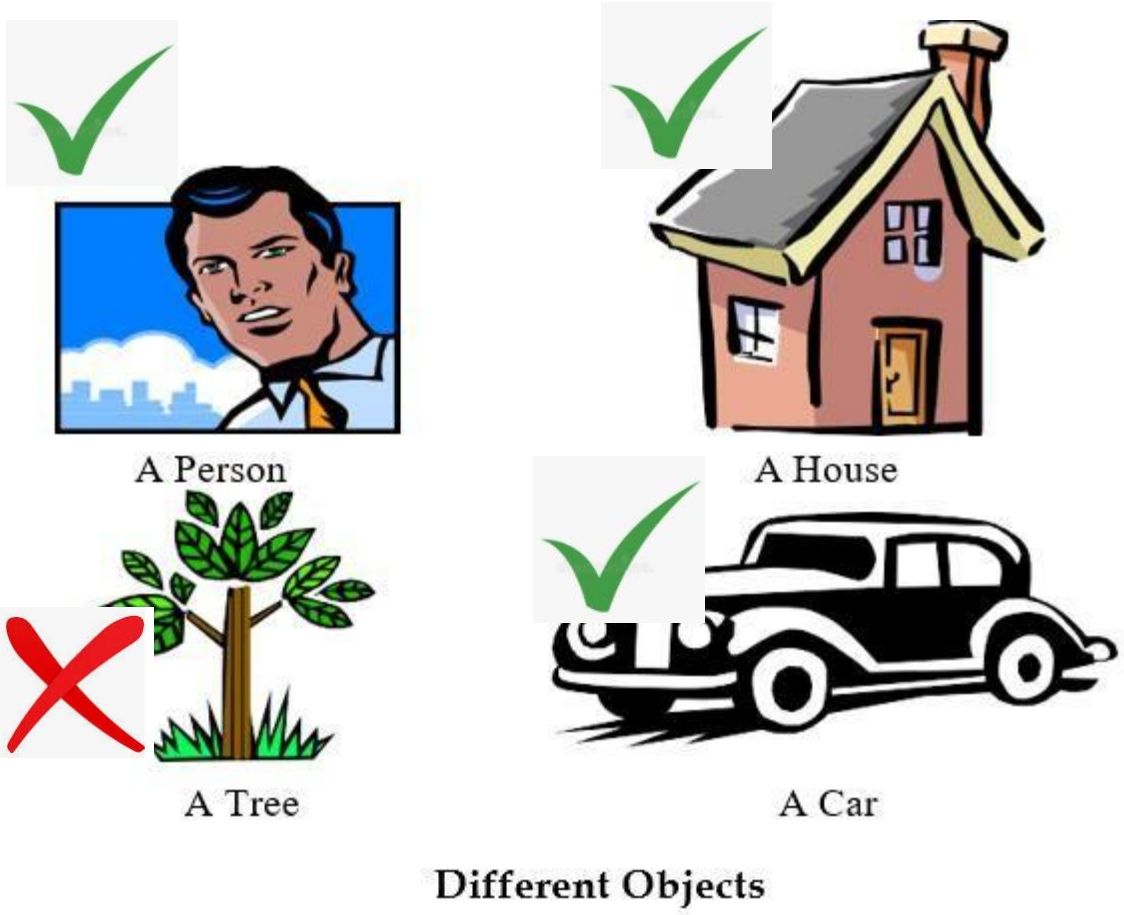
How to identify Objects?

- Object has **Identity**
  - What makes an object different from another object?
- Object has **State/ Characteristic**
  - What is the data of the object?
- Object has **Behavior**
  - What the object can do?
  - What can we do with the object?

Example 1

(Real World)

- Ali Lives in a house
- Ali Drives a car.



Person
Attributes: Name Age
Behavior: Live Drive
Identity: Name

Car
Attributes: Color Model
Behavior: Start Change Gear
Identity: Registration Number

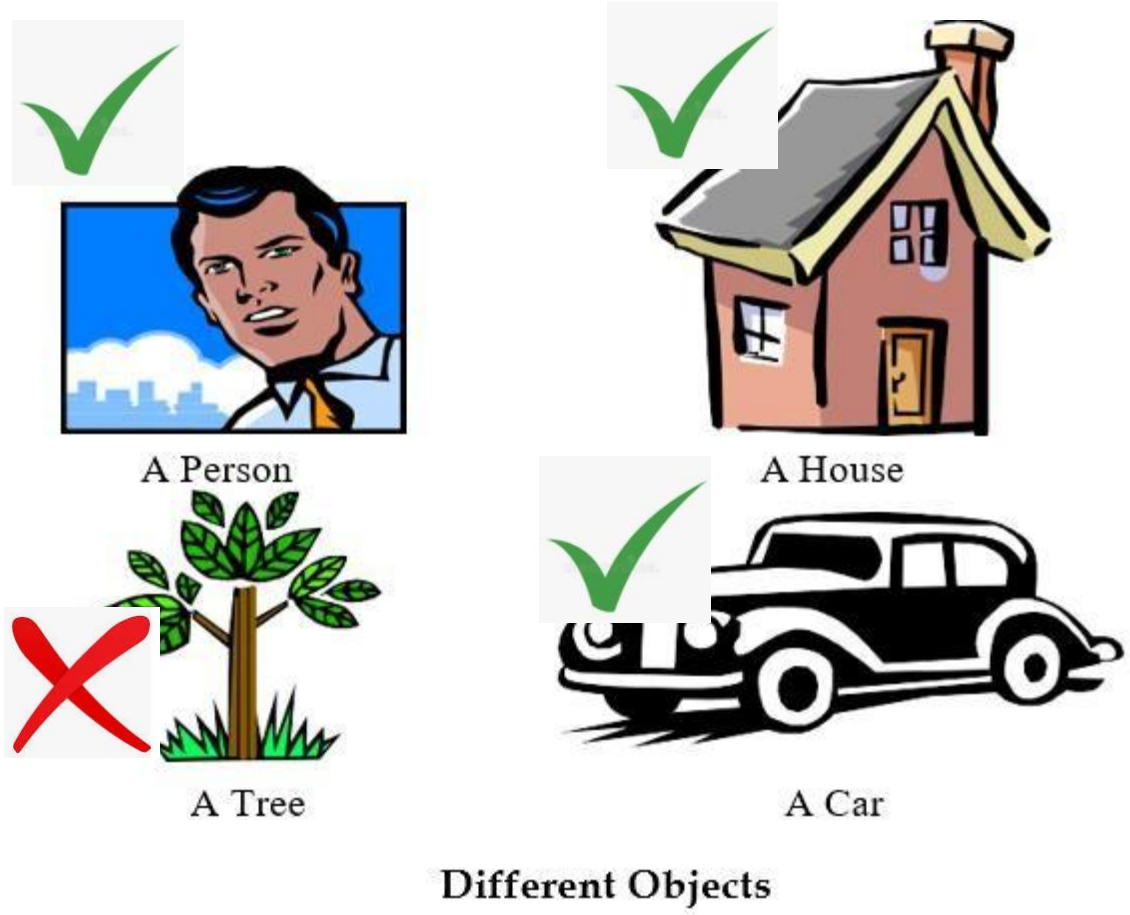
House
Attributes: House Number House Model
Behavior: Gives Shelter
Identity: House Number

Tree
Attributes: Tree Type Height
Behavior:

Time
Attributes: Hour Minutes Seconds
Behavior: Set Hour Set Minute
Identity: Date/Time

(Real World)

- Ali Lives in a house
- Ali Drives a car.



Person
Attributes: Name Age
Behavior: Live Drive
Identity: Name

Car
Attributes: Color Model
Behavior: Start Change Gear
Identity: Registration Number

House
Attributes: House Number House Model
Behavior: Gives Shelter
Identity: House Number

Tree
Attributes: Tree Type Height
Behavior:

Time
Attributes: Hour Minutes Seconds
Behavior: Set Hour Set Minute
Identity: Date/Time

Example 2

Course Management System

Problem Statement:

- In Software engineering department Students can register multiple courses.
- A course consists of course name, course code, and credit hours.
- Courses can be added, deleted or modified according to requirement.
- Student can download lectures, view attendance and marks of any course.
- Student has name, roll number and class details
- Teacher can add marks and attendance of students.
- Teacher can also upload lectures and view course details.
- Teacher has name, contact, designation and qualification details.

Course Management System

Problem Statement: (Noun Represents Objects)

- In Software engineering department **Students** can register multiple courses.
- A **course** consists of course name, course code, and credit hours.
- Courses can be added, deleted or modified according to requirement.
- Student can download lectures, view attendance and marks of any course.
- Student has name, roll number and class details
- **Teacher** can add marks and attendance of students.
- Teacher can also upload lectures and view course details.
- Teacher has name, contact, designation and qualification details.

Course Management System

Problem Statement: (Adjectives Represents Attributes)

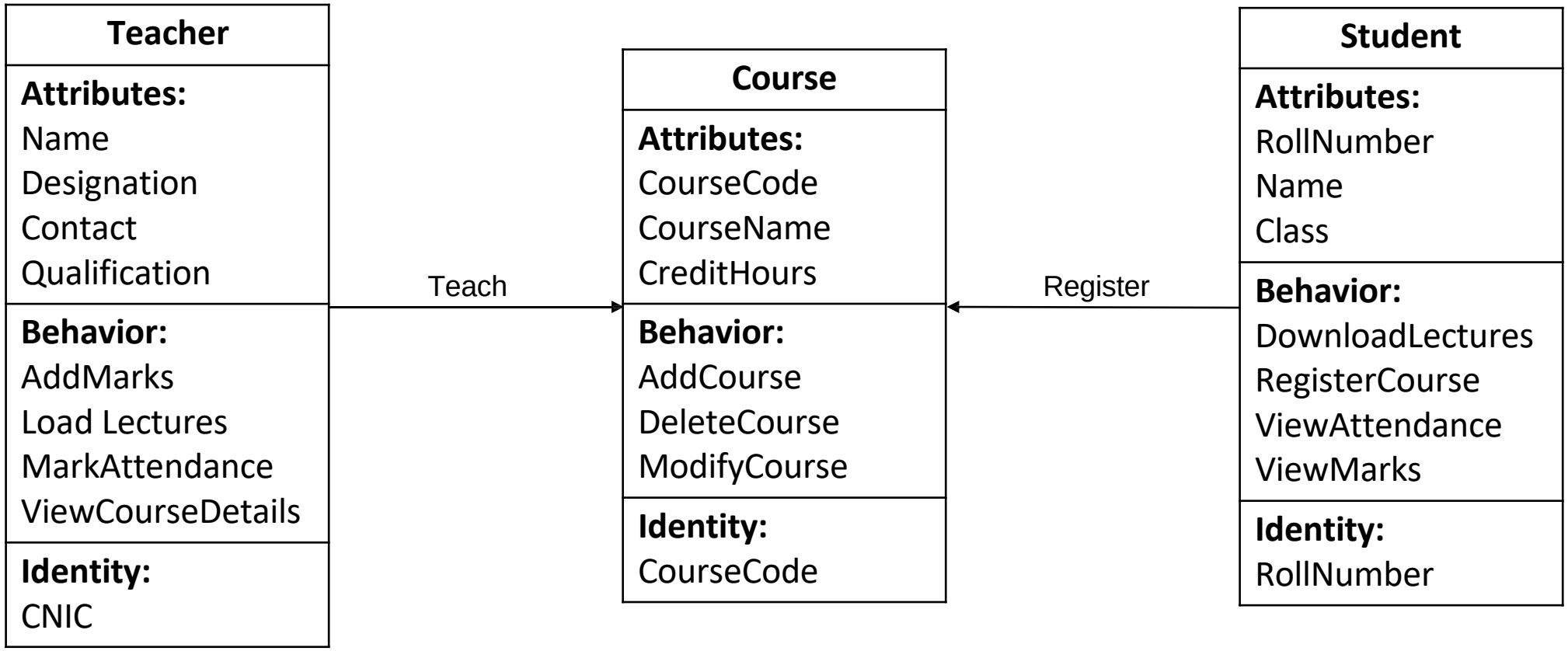
- In Software engineering department Students can register multiple courses.
- A course consists of course **name, course code**, and **credit hours**.
- Courses can be added, deleted or modified according to requirement.
- Student can download lectures, view attendance and marks of any course.
- Student has **name, roll number** and **class** details
- Teacher can add marks and attendance of students.
- Teacher can also upload lectures and view course details.
- Teacher has **name, contact, designation** and **qualification** details.

Course Management System

Problem Statement: (Verbs represents Behaviour(Methods))

- In Software engineering department Students can **register** multiple courses.
- A course consists of course name, course code, and credit hours.
- Courses can be **added, deleted** or **modified** according to requirement.
- Student can **download lectures**, **view attendance** and marks of any course.
- Student has name, roll number and class details
- Teacher can **add marks** and **attendance** of students.
- Teacher can also **upload lectures** and view course details.
- Teacher has name, contact, designation and qualification details.

Object Oriented Model (Class Diagram)



References

- Object Oriented Programming in C++ Robert Lafore, Chapter 1.
- Object Oriented Programing , Virtual University , Lecture 1, Online Available at: https://ocw.vu.edu.pk/CourseDetails.aspx?cat=Computer+Science%2FInformation+Technology+&course=CS304

THANKS