

Object Oriented Programming Concepts

Session 1

Contents...

- Understand OOPL
- Understand Object
- List Characteristics of an Object
- Understand major pillars of OOPS
 - Abstraction
 - Encapsulation
 - Inheritance
 - Polymorphism

Object Oriented Concepts

- Object Oriented Programming?
 - Programming language, which allows you to convert real life entities in to programming object.
 - Employee, Student,

What is an Object?

- Any real world entity which has well defined structure and behavior.
 - Structure / Properties
 - Screen Size
 - Processor
 - RAM
 - OS
 - Behavior
 - Start
 - Shut Down
 - Attend Sessions via Skype

Characteristics of an Object

- State
- Behavior
- Identity
- Responsibility

State of an Object

- Defines current values of all the attributes

Properties / Attribute	Values / State
Processor	Core I3
Screen Size	15"
RAM	4 GB
HDD	500 GB
CD ROM	Yes
VGA / HDMI	HDMI

Properties / Attribute	Values / State
Employee Id	1234
Employee Name	Sangeep Khot
Basic Salary	15000
Department	Manual Testing
Age	28
Qualification	B. E. Prod.

Behavior

- Operations performed by object or operations can be performed on object.
- How your object acts or reacts when its state changes.

Properties / Attribute	Values / State	Behavior
Employee Id	1234	displayData
Employee Name	Sangeep Khot	calculateSalary
Basic Salary	20000	assignProject
Department	Manual Testing	appraisal
Age	28	
Qualification	B. E. Prod.	

Identity

- Property (or group of properties) of an object which distinguishes it from all other objects.
- MH09-AH-246
- MH09-DL-246

Properties / Attribute	Values / State	Behavior
Employee Id	1234	displayData
Employee Name	Sangeep Khot	calculateSalary
Basic Salary	20000	assignProject
Department	Manual Testing	appraisal
Age	28	
Qualification	B. E. Prod.	

Responsibility

- The role it serves within the system.

Properties / Attribute	Values / State	Behavior	Responsibility
Employee Id	1234	displayData	Be present in office
Employee Name	Sangeep Khot	calculateSalary	Swipe card
Basic Salary	20000	assignProject	Get Salary
Department	Manual Testing	appraisal	Provide information
Age	28		Attend meetings
Qualification	B. E. Prod.		

Major Pillars of OOPS

- Abstraction
- Encapsulation
- Inheritance
- Polymorphism

Abstraction

Person	Employee	Health Care	Social Survey
Name	Name	Name	Name
Address	Address	Address	Address
Qualification	Qualification		Qualification
Salary	Salary		
Height		Height	
Weight		Weight	
Nationality			Nationality
Caste			Caste
Blood Group		Blood Group	
Employee ID	Employee ID		
Blood Pressure		Blood Pressure	
Age	Age	Age	Age

Abstraction

- Process of identifying the key aspects of an entity and **ignoring the rest.**
- Types
 - Data Abstraction
 - Behavioral Abstraction

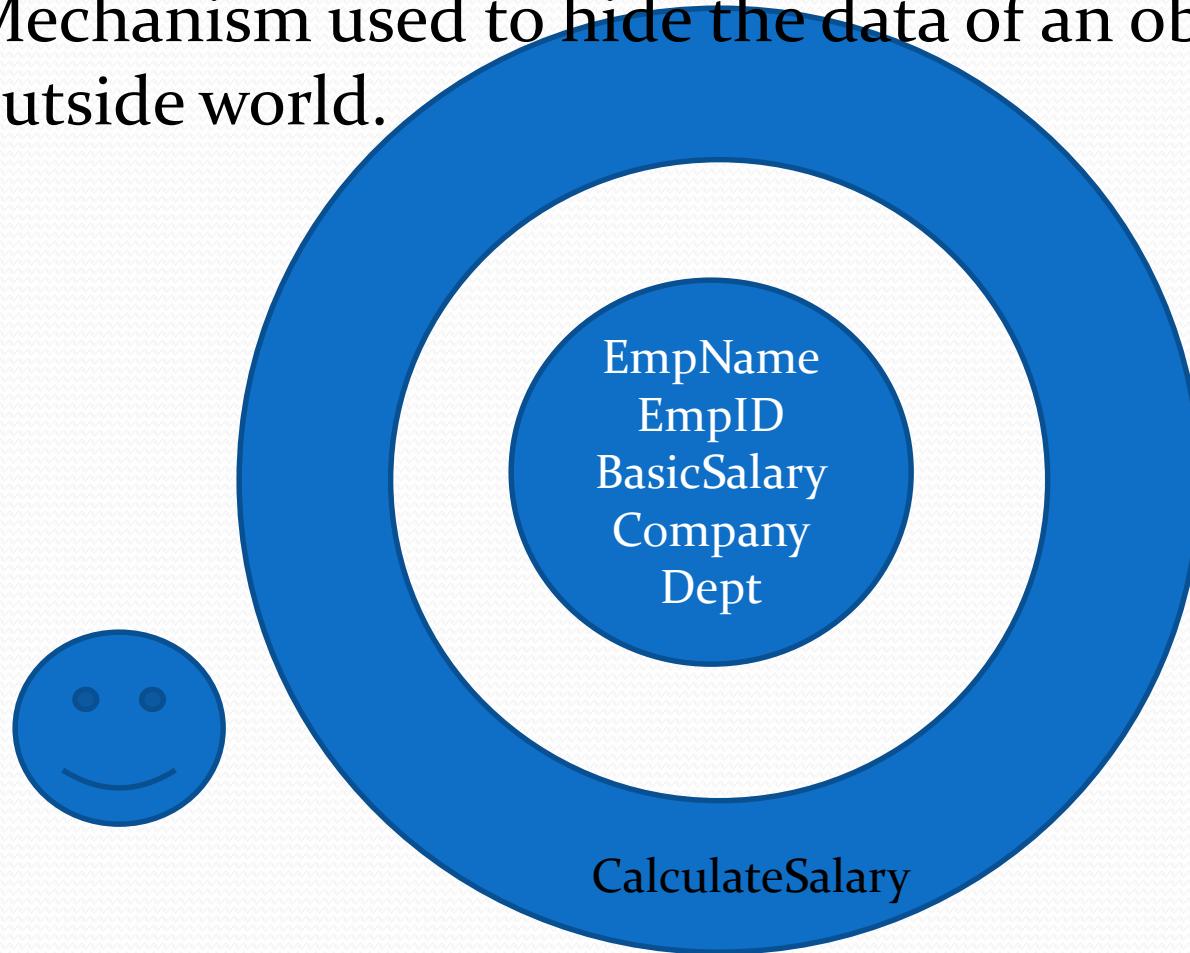
Data Abstraction	Behavioral Abstraction
Employee ID	displayData
Employee Name	calculateSalary
Department	appraisal
Basic Salary	
Company	

Encapsulation

- Bike's Look
- Color
- Current Speed
 - Increase → Up arrow key
 - Decrease → Down arrow key
- Highest Speed
- Rider's name
- Current Gear

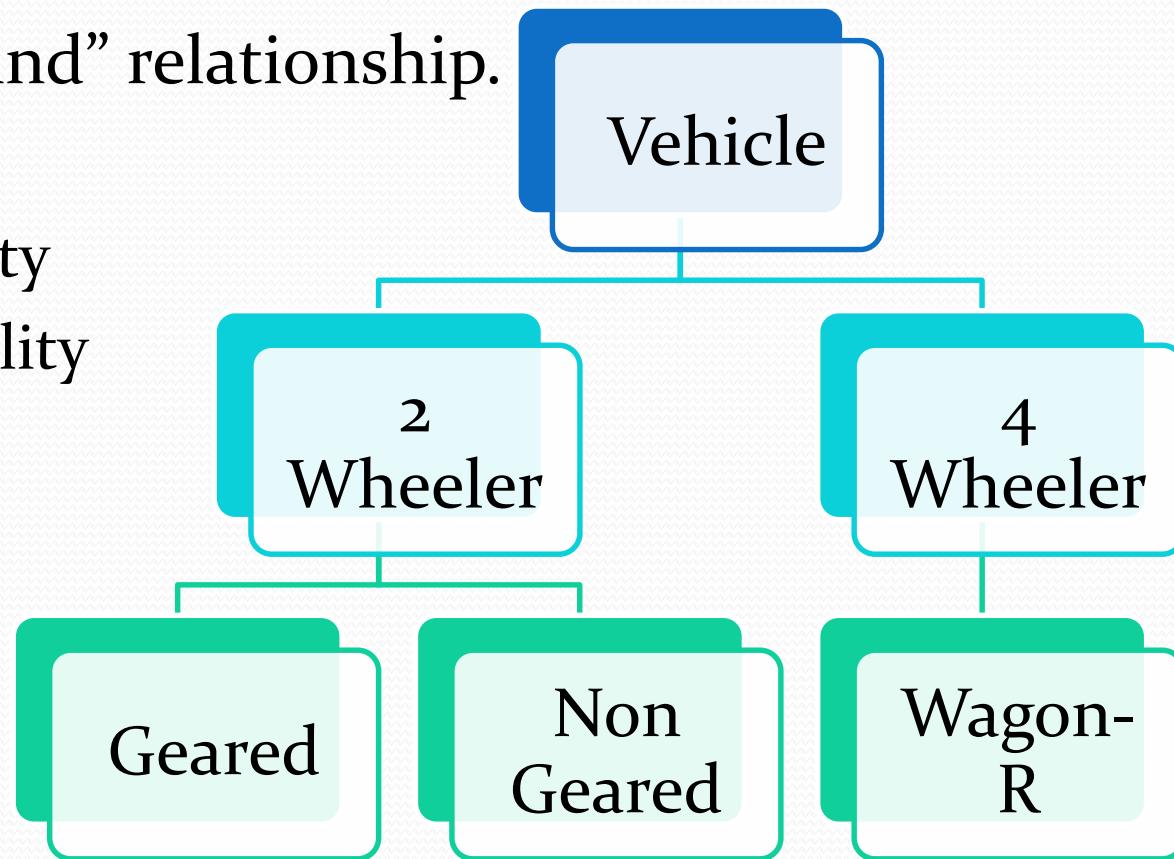
Encapsulation

- Mechanism used to hide the data of an object from outside world.

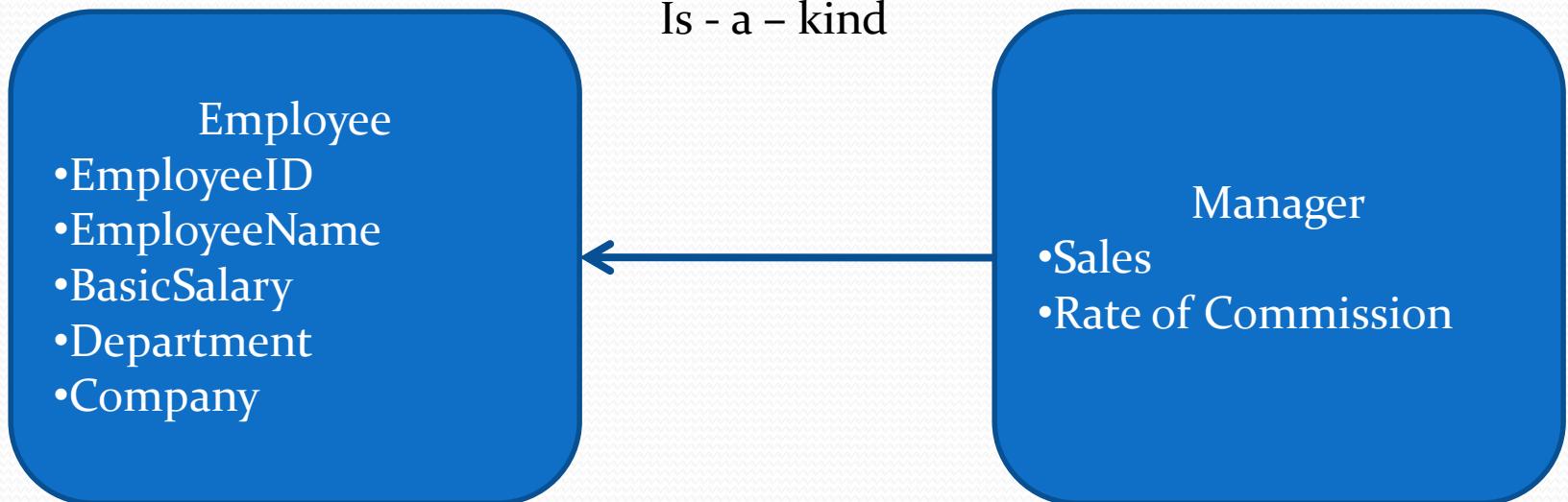


Inheritance

- The process by which one object can acquire properties of another object.
- It is “is-a-kind” relationship.
- Use
 - Reusability
 - Extensibility



Inheritance



Polymorphism

- Ability of different types of related objects to respond the same message in different way.

Employee

- EmployeeID
- EmployeeName
- BasicSalary
- Department
- Company
- CalculateSalary

Manager

- Sales
- Rate of Commission
- CalculateSalary



Minor Pillars of OOPS

- Strong Typing
- Concurrency
- Persistence