Inheritance – A Person will inherit the property of his/her parents/grant parents.

How one class is connected to other class – Inheritance explains about the relationships between the classes.

Two types of relationship is available in JAVA

1. Is a relationship (Car is a Vehicle, crow is a bird, Tiger is an Animal, Manager is a Employee…)
2. Has a relationship (Car has a Engine, Car has tires, Bird has a wing, Manager has a ID)

Is a – we can use extends keyword for this.

Has a – interfaces will help to get has a relationship ( Beans can be serialized)

Types of Inheritance

1. Simple Inheritance (Parent – Child)
2. Multi-level Inheritance (Grant Parent -Parent -Child) or (Parent -Child – Grand Child)
3. Multiple – inheritance (parent A & parent B – Child )
4. Hybrid Inheritance (parent A & parent B – Child – grand child)

Types Of Variables

1. Reference Variable – Object Reference (These are all pointers which holds the memory address of objects that is created with the help of new keyword)
2. Instance Variable – Member properties of the class. These variables are defined outside any methods and inside the class.
3. Local Variable – The variable declared inside any method and/or passed to methods as arguments. It will be available only with in the method.
4. Class Variable – (Static Variable) – Only one instance will be available for entire class. This variable will be shared by all the objects of that class.

Child class can get all public, protected and default members.

**Inheritance** – Reuse existing code & members

**Encapsulation** – It is achieved with the help of access modifiers

Having all private member variables and public member methods – Encapsulation

Encapsulation – **Hiding the Data** (Data is secured) – Securing the data inside a capsule.

1. Tablets 2) Pills 3) Capsules 4) Syrup 5) Balms

When we define a JAVA Class, all the member properties are also called as states will be secured from the external world using private access modifier.

Abstraction – Hiding Implementation

Abstraction – Incomplete – Showing relevant data and hiding irrelevant data

Abstraction is achieved with the help of abstract keyword and interface

Abstract – keyword – Is a behavior modifier

1. In front a class & a method
2. If it is used in front of method – It’s a incomplete / non-concrete/ abstract method – A method with only signature line (Method with declaration line & no definition)

Database – Oracle, MySQL, MS-SQL, Postgres, MongoDB

Car – Designing a Car – Car needs to have an Engine, Car needs to have seats, tires, transmission Mechanism, safetyFeatues.

Car – applyBreak(), accelerate()

Abstract classes, methods & interfaces are used to provide specification.

Java.sql – Interfaces to interact with the database

Abstract class can have non-abstract methods

Interface – by default the member methods are public and abstract (100% abstraction is achieved )

Default & static methods (Java 8)

In java Multiple inheritance. – A class can’t extend more than one class

Public class Car extends ElectricCar implements Vehicle

1. Encapsulation – Hiding the Data
2. Abstraction – Hiding the implementation
3. Inheritance – Reusing the code
4. Polymorphism – Many forms – Reusing the code

A human, A Person, A father, A son, A husband , A friend to many, A Trainer

Types of Polymorphism

1. Static Polymorphism – Compile time polymorphism – Method Overloading
2. Dynamic Polymorphism – Run Time Polymorphism – Method Overriding

Method OverLoading – Redefining same method in a class by changing it’s signature.

Method OverRiding – Redefining the same method in derived class without changing it’s signature