WEEK 10

Inheritance with Java

Part 1

Nurnasran Puteh

Outline

- Types of inheritance
- Defining child class in Java

Learning Objectives

- To differentiate between single and multiple inheritance
- To define a child class in Java using `extends` keyword

There are two types of Inheritances

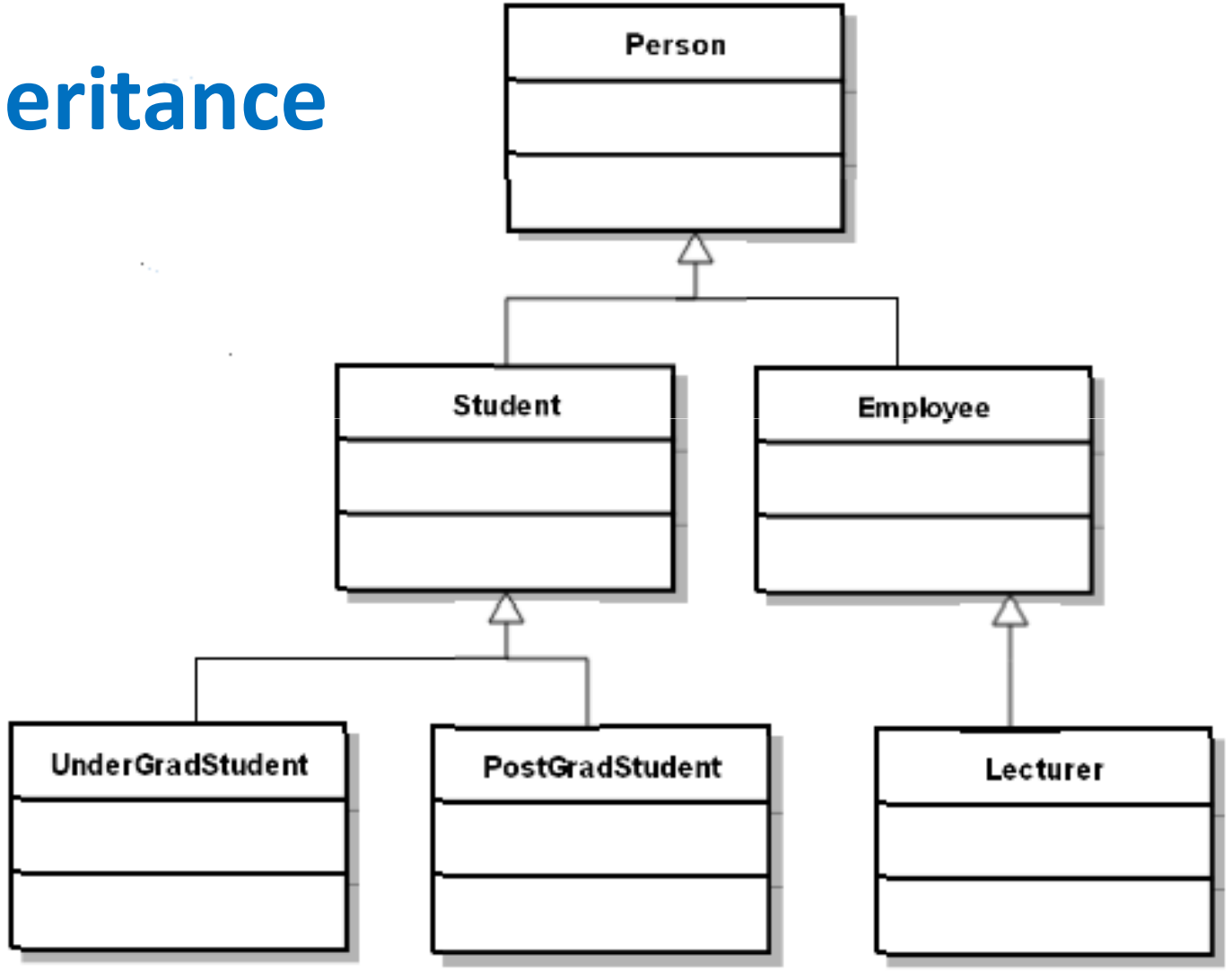
Single inheritance

a child class can be derived from a single/one parent class only

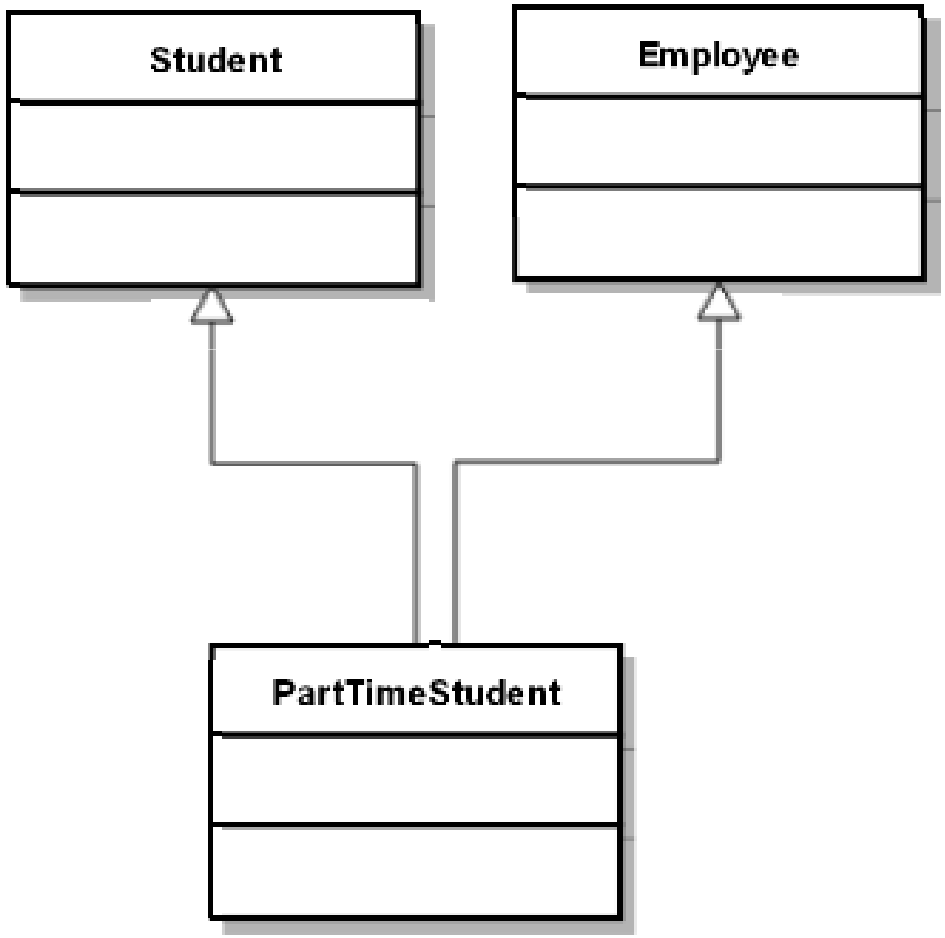
Multiple inheritance

a child class can be derived from more than one parent class

Single Inheritance



Multiple Inheritance



Type of inheritance in 

Java only supports single inheritance!

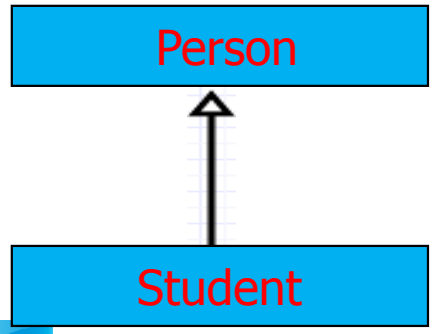
Inheritance with Java

How to define a class is a child of a parent class?

-Use the Java extends keyword .

-A child class is said to extend the parent class

because it inherits properties from the parent and can add more new properties of its own



The extends keyword

Syntax:

```
class <ChildClassName> extends <ParentClassName>
{
        // data & methods specific to child
}
```

Example:

```
public class Student extends Person {

        //data & method definitions

}
```

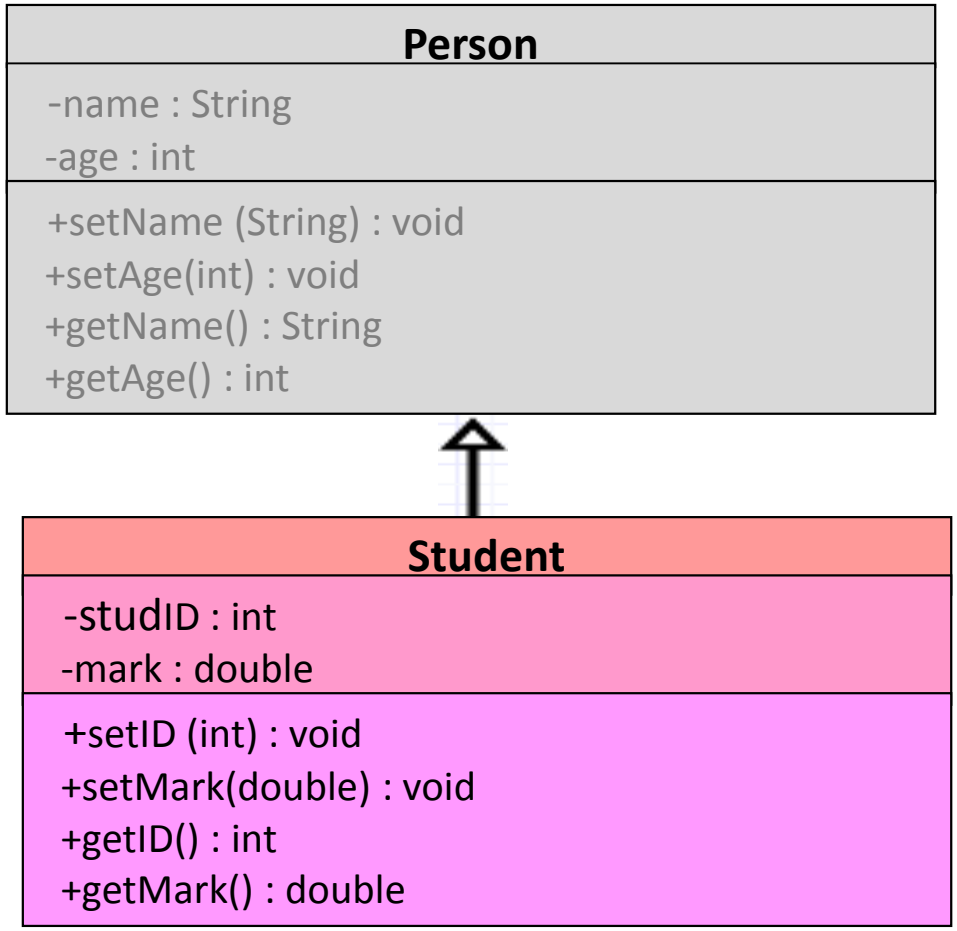
First, define the parent class Person

Person
-name : String -age : int
+setName (String) : void +setAge(int) : void +getName() : String +getAge() : int

Parent class: Person

```
public class Person {

    private String name;
    private int age;

    public void setName(String name) {
        this.name = name;
    }

    public void setAge(int age) {
        this.age = age;
    }

    public String getName() {
        return name;
    }

    public int getAge() {
        return age;
    }

}
```

Next, define the child class Student



Child class: Student

```
public class Student extends Person {
    private int studID;
    private double mark;

    public void setID(int matric) {
        this.studID = matric;
    }

    public void setMark(double mark) {
        this.mark = mark;
    }

    public int getID() {
        return studID;
    }

    public double getMark() {
        return mark;
    }
}
```

Next, we write a test program

```
public class TestProgram {

    public static void main(String[] args) {
        Person p1 = new Person();
        Student s1 = new Student();

        p1.setName("Ali");
        p1.setAge(30);

        s1.setName("Siti");
        s1.setAge(19);
        s1.setID(11111);
        s1.setMark(95);

        System.out.println("Person name is "+p1.getName());
        System.out.println("Person age is "+p1.getAge());
        System.out.println("Student name is "+s1.getName());
        System.out.println("Student age is "+s1.getAge());
        System.out.println("Student ID is "+s1.getID());
        System.out.println("Student mark is "+s1.getMark());

    }

}
```

Output:

```
run:
Person name is Ali
Person age is 30
Student name is Siti
Student age is 19
Student ID is 11111
Student mark is 95.0
BUILD SUCCESSFUL (total time: 1 second)
```

Summary

- There are two types of inheritance: single and multiple inheritance
- Java only supports single inheritance
- Use the Java ‘extends’ keyword in the header of the class definition to define a child class