2nd Year CC computer Engineering
University of Batna 2, October, 2023

TP4

Object-oriented programming

(inheritance)

Exercise 01 :

1- Create a base class called **Shape** with the following attributes and methods:

Attributes: color (String) and filled (boolean).

Methods:

Shape() :(default constructor)

Shape(String color, boolean filled) :(parameterized constructor)

getColor(): String (returns the color)

setColor(String color): void (sets the color)

isFilled(): boolean (returns true if the shape isfilled, false otherwise)

setFilled(boolean filled): void (sets whether the shape is filled or not)

toString(): String (returns a string representation of the shape).

Create two subclasses, **Circle and Rectangle**, that **extend** the **Shape**.

class Circle should have:

Attributes: radius (double)

Methods:

Circle() (default constructor)

Circle(double radius) (parameterized constructor)

getRadius(): double (returns the radius)

setRadius(double radius): void (sets the radius)

Override toString(): String to include information about the circle.

Rectangle should have:

Attributes: width (double) and **length (double)**

Methods:

Rectangle() (default constructor).

Rectangle(double width, double length) (parameterized constructor)

getWidth(): double (returns the width)

setWidth(double width): void (sets the width)

getLength(): double (returns the length)

setLength(double length): void (sets the length)

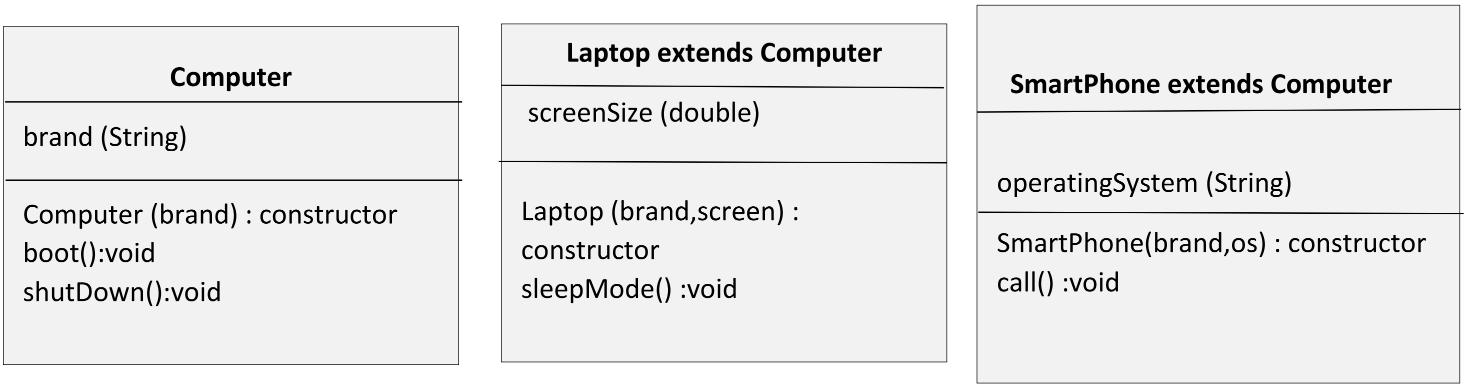
Override toString(): String to include information about the rectangle.

Exercise 02 :

Create a Java program that demonstrates inheritance in a computer-related scenario. You are required to define a Computer class as the parent class and two subclasses: Laptop and SmartPhone.

Create instances of Laptop and SmartPhone.

Demonstrate the methods of both classes: booting up, shutting down, sleepMode (for Laptop), and making a call (for SmartPhone).



Computer

brand (String)

Computer (brand) : constructor
boot():void
shutDown():void

Laptop extends Computer

screenSize (double)

Laptop (brand,screen) : constructor
sleepMode() :void

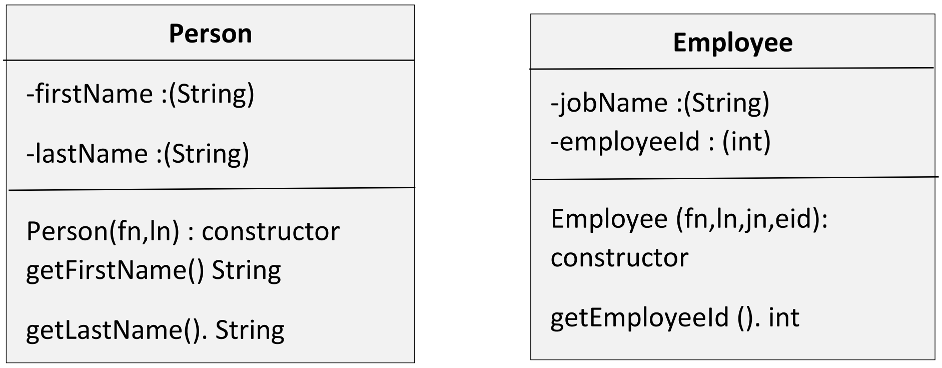
SmartPhone extends Computer

operatingSystem (String)

SmartPhone(brand,os) : constructor
call() :void

Exercise 03 :

Write a Java program to create a class known as Person with methods called getFirstName() and getLastName(). Create a subclass called Employee that adds a new method named getEmployeeId() and overrides the getLastName() method to include the employee's job title.



Person

-firstName :(String)

-lastName :(String)

Person(fn,ln) : constructor
getFirstName() String

getLastName(). String

Employee

-jobName :(String)
-employeeId : (int)

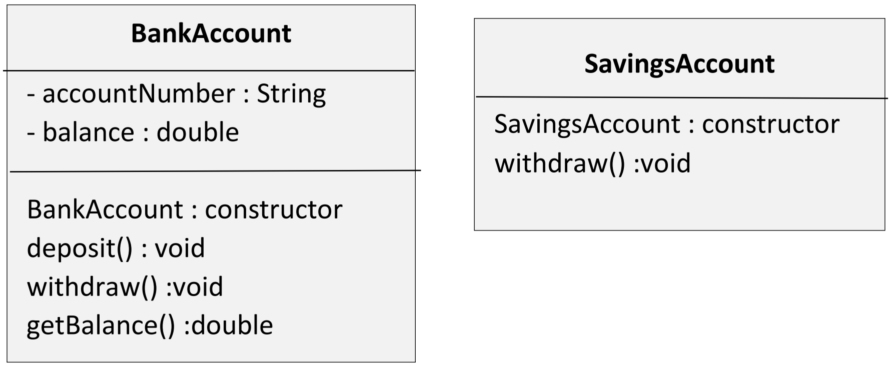
Employee (fn,ln,jn,eid):
constructor

getEmployeeId (). int

Exercise 04 :

Write a Java program to create a class known as "BankAccount" with methods called deposit() and withdraw(). Create a subclass called SavingsAccount that overrides the withdraw() method to prevent withdrawals if the account balance falls below one hundred.

Provide a constructor that generates a random 8-digit :account number .



BankAccount

- accountNumber : String
- balance : double

BankAccount : constructor
deposit() : void
withdraw() :void
getBalance() :double

SavingsAccount

SavingsAccount : constructor
withdraw() :void