**Department of Computer Science and Engineering**

A

**LAB FINAL EXAMINATION Spring2019**

**CSE 111: Programming Language II**

**Afternoon**

**Section: \_\_\_ ID: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name in CAPITAL: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

#### Question 1 [10 Points]

Given the following classes, write the code for the **Lamborghini** class so that the following output is created [**Lamborghini** extends Car].

|  |
| --- |
| **OUTPUT**  **Garraldo is moving**  **Top Speed of 349**  **==================**  **Huracan is moving**  **Top Speed of 444**  **==================**  **Garraldo is moving**  **Top Speed of 349**  **==================**  **2**  **2** |
| **public abstract class Car implements Moveable{**  **public String color;**  **public String manufacturer;**  **String carName;**  **public static int carCount=0;**  **Car(String color, String manufacturer, String name){**  **this.color = color;**  **this.manufacturer = manufacturer;**  **this.carName = name;**  **}**  **public abstract void setTopSpeed(int topSpeed);**  **public abstract int totalCars();**  **}** |
| **public interface Moveable{**  **public void move();**  **}** |
| **public class CarTesterA {**  **public static void main(String[] args) {**  **Lamborghini car1 = new Lamborghini("Yellow", "Lamborginni", "Garraldo");**  **Lamborghini car2 = new Lamborghini("Yellow", "Lamborginni", "Huracan");**  **Lamborghini car3 = (Lamborghini) car1;**  **car1.setTopSpeed(349);**  **car1.move();**  **System.out.println("==================");**  **car2.setTopSpeed(444);**  **car2.move();**  **System.out.println("==================");**  **car3.move();**  **System.out.println("==================");**  **System.out.println(car1.totalCars());**  **System.out.println(car3.totalCars());**  **}**  **}** |

**Question 2 [10 Points]**

**Assume that the following classes have been defined:**

|  |
| --- |
| **class Alfie extends John {** |
| **String power = "Jewsish leader";** |
| **public void method1() {** |
| **super.method1();** |
| **System.out.println("Gunman m1");** |
| **System.out.println(this);** |
| **}** |
| **public void method3() {** |
| **System.out.println("Gunman m2");** |
| **}** |
| **}** |
| **class Arthur extends TommyShelby {** |
| **String power = "Arthur Shelby";** |
| **public void method1() {** |
| **System.out.println("mercenary m1");** |
| **}** |
| **public void method2() {** |
| **System.out.println("mercenary m2");** |
| **}** |
| **public void method3() {** |
| **System.out.println("mercenary m3");** |
| **method1();** |
| **}** |
| **public String toString(){** |
| **return "The elder brother is "+ power;** |
| **}** |
| **}** |
| **class John extends Arthur {** |
| **String power = "hotShot";** |
| **public void method1() {** |
| **System.out.println("Jonny m1");** |
| **}** |
| **public void method4() {** |
| **System.out.println("Jonny m4");** |
| **}** |
| **public String toString(){** |
| **method2();** |
| **return "Johny gets married because he is "+ power;** |
| **}** |
| **}** |
| **class Polly extends TommyShelby {** |
| **String power = "Polly Gray ";** |
| **public void method2() {** |
| **System.out.println("Polly m2");** |
| **}** |
| **public void method3() {** |
| **System.out.println("Polly m3");** |
| **}** |
| **public String toString(){** |
| **return "The Accountant is "+ power;** |
| **}** |
| **}** |
| **class TommyShelby{** |
| **String power = "Thomas Shelby";** |
| **public void method1() {** |
| **method2();** |
| **System.out.println("Godfather m1");** |
| **}** |
| **public void method2() {** |
| **System.out.println("Godfather m2");** |
| **}** |
| **public String toString(){** |
| **method2();** |
| **return "Godfather is"+ power;** |
| **}** |
| **}** |

**And assume that the following variables have been defined:**

**TommyShelby don1 = new TommyShelby();**

**TommyShelby don2 = new Arthur();**

**Polly newYorker1 = new Polly();**

**Arthur hotHeaded1 = new Arthur();**

**Arthur hotHeaded2 = new John();**

**Object obj1 = new Polly();**

**TommyShelby newSicilian = new Alfie();**

**In the table below, indicate in the right-hand column the output produced by the statement in the left-hand column. If the statement produces more than one line of output, indicate the line breaks with slashes as in "a/b/c" which indicates three lines of output with "a" followed by "b" followed by "c". If the statement causes an error, fill in the right-hand column with either “CT” for “compile time error" or RE for "runtime error" to indicate when the error would be detected.**

|  |  |
| --- | --- |
| **Statement** | **Output** |
| **((Arthur)hotHeaded2).method3();** |  |
| **System.out.println(newYorker1);** |  |
| **((TommyShelby)newYorker1).method2();** |  |
| **((Object)don1).toString();** |  |
| **don2.method2();** |  |
| **System.out.println(((Arthur)hotHeaded2).power);** |  |
| **((TommyShelby)newYorker1).method3();** |  |
| **hotHeaded1.method1();** |  |
| **((John)obj1).method2();** |  |
| **System.out.println(newSicilian);** |  |

**Question 3 [10 Points]**

|  |
| --- |
| **public class A{** |
| **public static int temp = 4;** |
| **public int sum;** |
| **public int y;** |
| **public A(){** |
| **y=y++ + temp;** |
| **sum+= temp + 6;** |
| **temp-=1;** |
| **}** |
| **public A(int x){** |
| **y-=temp - 2 + x;** |
| **sum = temp + 1;** |
| **temp-=2;** |
| **}** |
| **public void methodB(int m, int n){** |
| **int x = 1;** |
| **y+= m + (temp++);** |
| **x-= 22 + n;** |
| **sum = sum + x + y;** |
| **System.out.println(y + " " + x+ " " + sum);** |
| **}** |
| **}public class B extends A {** |
| **public int x;** |
| **public static int sum;** |
| **public B(int p){** |
| **super(p);** |
| **y = temp + p ;** |
| **sum = p+ temp + 1;** |
| **temp-=1;** |
| **}** |
| **public B(B b){** |
| **sum = b.sum;** |
| **x = b.x;** |
| **}** |
| **public void methodB(int m, int n){** |
| **int y =0;** |
| **y = y + this.y;** |
| **x-= this.y + temp;** |
| **super.methodB(x, y);** |
| **sum = x + y + super.sum;** |
| **System.out.println(x + " " + y+ " " + sum);** |
| **}** |
| **}** |

**Consider the following code sequence, what will be the output?**

|  |  |  |  |
| --- | --- | --- | --- |
| **A a1 = new A(3); B b1 = new B(2); B b2 = new B(b1); a1.methodB(3, 2); b2.methodB(2, 3); System.out.println(b1.y);** | **x** | **y** | **sum** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |