## CSCI 145 PA \_\_4\_\_ Submission

## Due Date:\_\_March 21, 2023\_\_ Late (date and time):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Name(s):\_\_Ivan Leung\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exercise 1 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

package pa4;

/\* Java Class: CSCI 145

Modified by: Ivan Leung

Class: Mon/Wed

Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

//Student.java

//

//Define a student class that stores name, score on test 1, and

//score on test 2. Methods prompt for and read in grades,

//compute the average, and return a string containing student's info.

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

import java.util.Scanner;

public class Student {

// declare instance data

private String name;

private double test1Score;

private double test2Score;

private static Scanner scan = new Scanner(System.in);

// ---------------------------------------------

// constructor

// ---------------------------------------------

public Student(String studentName) {

this.name = studentName;

}

// ---------------------------------------------

// inputGrades: prompt for and read in student's grades for test1 and test2.

// Use name in prompts, e.g., "Enter's Joe's score for test1".

// ---------------------------------------------

public void inputGrades() {

// add body of inputGrades

System.out.print("Enter " + this.name + "'s score for test1: ");

this.test1Score = scan.nextDouble();

System.out.print("Enter " + this.name + "'s score for test2: ");

this.test2Score = scan.nextDouble();

}

// ---------------------------------------------

// getAverage: compute and return the student's test average

// ---------------------------------------------

// add header for getAverage

public double getAverage() {

// add body of getAverage

return (test1Score + test2Score) / 2;

}

// ---------------------------------------------

// getName: print the student's name

// ---------------------------------------------

// add header for printName

public String getName() {

// add body of printName

return this.name;

}

}

**package** pa4;

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\*/

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

// Grades.java

//

// Use Student class to get test grades for two students

// and compute averages

//

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public** **class** Grades {

**public** **static** **void** main(String[] args) {

Student student1 = **new** Student("Mary");

// create student2, "Mike"

Student student2 = **new** Student("Mike");

// input grades for Mary

student1.inputGrades();

// print average for Mary

System.***out***.printf("%s's average grade is %.1f%n", student1.getName(), student1.getAverage());

System.***out***.println();

// input grades for Mike

student2.inputGrades();

// print average for Mike

System.***out***.printf("%s's average grade is %.1f%n", student2.getName(), student2.getAverage());

}

}

Input/output below:

Enter Mary's score for test1: 89

Enter Mary's score for test2: 56

Mary's average grade is 72.5

Enter Mike's score for test1: 83

Enter Mike's score for test2: 87

Mike's average grade is 85.0

Exercise 2 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

**package** pa4;

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Modified by: Ivan Leung

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Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

**public** **class** Name {

**public** Name(String first, String middle, String last) {

**this**.first = first;

**this**.middle = middle;

**this**.last = last;

}

**public** String getFirst() {

**return** **this**.first;

}

**public** String getMiddle() {

**return** **this**.middle;

}

**public** String getLast() {

**return** **this**.last;

}

**public** String firstMiddleLast() {

**return** (**this**.first + " " + **this**.middle + " " + **this**.last);

}

**public** String lastFirstMiddle() {

**return** (**this**.last + ", " + **this**.first + " " + **this**.middle);

}

**public** **boolean** equals(Name otherName) {

**return** **this**.first.equalsIgnoreCase(otherName.getFirst()) && **this**.middle.equalsIgnoreCase(otherName.getMiddle()) && **this**.last.equalsIgnoreCase(otherName.getLast());

}

**public** String initials() {

**return** (**this**.first.substring(0, 1).toUpperCase() + **this**.middle.substring(0, 1).toUpperCase() + **this**.last.substring(0, 1).toUpperCase());

}

**public** **int** length() {

**return** (**this**.first.length() + **this**.middle.length() + **this**.last.length());

}

**private** String first;

**private** String middle;

**private** String last;

}

**package** pa4;

/\* Java Class: CSCI 145

Modified by: Ivan Leung

Class: Mon/Wed

Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

**import** java.util.Scanner;

**public** **class** TestNames {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

Scanner scan = **new** Scanner(System.***in***);

Name user1;

Name user2;

System.***out***.print("Enter the first user's name in first-middle-last format with space in between: ");

user1 = **new** Name(scan.next(), scan.next(), scan.next());

System.***out***.print("Enter the second user's name in first-middle-last format with space in between: ");

user2 = **new** Name(scan.next(), scan.next(), scan.next());

System.***out***.println("The first user's name in first-middle-last format is: " + user1.firstMiddleLast());

System.***out***.println("The first user's name in last-first-middle format is: " + user1.lastFirstMiddle());

System.***out***.println("The first user's initial is: " + user1.initials());

System.***out***.println("The first user's full name in length is: " + user1.length());

System.***out***.println();

System.***out***.println("The second user's name in first-middle-last format is: " + user2.firstMiddleLast());

System.***out***.println("The second user's name in last-first-middle format is: " + user2.lastFirstMiddle());

System.***out***.println("The second user's initial is: " + user2.initials());

System.***out***.println("The second user's full name in length is: " + user2.length());

System.***out***.println();

**if** (user1.equals(user2))

System.***out***.println("The first and second users have the same name");

**else**

System.***out***.println("The first and second users do not have the same name");

}

}

Input/output below:  
  
Enter the first user's name in first-middle-last format with space in between: Ivan Honyan Leung

Enter the second user's name in first-middle-last format with space in between: Mary Jane Smith

The first user's name in first-middle-last format is: Ivan Honyan Leung

The first user's name in last-first-middle format is: Leung, Ivan Honyan

The first user's initial is: IHL

The first user's full name in length is: 15

The second user's name in first-middle-last format is: Mary Jane Smith

The second user's name in last-first-middle format is: Smith, Mary Jane

The second user's initial is: MJS

The second user's full name in length is: 13

The first and second users do not have the same name

Exercise 3 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

**package** pa4;

//Created by T. Vo for CSCI 145 Spring 2023

//It can be as an option for PA 4 instead of JavaFX

//Modified by: Ivan Leung

/\* Java Class: CSCI 145

Modified by: Ivan Leung

Class: Mon/Wed

Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

**import** java.awt.Color;

**import** java.awt.Dimension;

**import** java.awt.Graphics;

**import** java.awt.Rectangle;

**import** java.util.Random;

**import** javax.swing.JFrame;

**public** **class** DrawingRectangleApp **extends** JFrame {

**public** DrawingRectangleApp() {

**super**("Drawing Rectangles");

// getContentPane().setBackground(Color.GREEN);

setDefaultCloseOperation(JFrame.***EXIT\_ON\_CLOSE***);

setPreferredSize(**new** Dimension(600, 400));

pack();

}

**public** **void** paint(Graphics page) {

**super**.paint(page);

Random rand = **new** Random();

// add your code to draw the 5 rectangles

**int** x = rand.nextInt(401);

**int** y = rand.nextInt(201);

**int** width = (rand.nextInt(501) + 100) - x;

**int** height = (rand.nextInt(301) + 100) - y;

page.setColor(Color.***red***);

page.drawRect(x, y, width, height);

x = rand.nextInt(401);

y = rand.nextInt(201);

width = (rand.nextInt(501) + 100) - x;

height = (rand.nextInt(301) + 100) - y;

page.setColor(Color.***green***);

page.drawRect(x, y, width, height);

x = rand.nextInt(401);

y = rand.nextInt(201);

width = (rand.nextInt(501) + 100) - x;

height = (rand.nextInt(301) + 100) - y;

page.setColor(Color.***blue***);

page.drawRect(x, y, width, height);

x = rand.nextInt(401);

y = rand.nextInt(201);

width = (rand.nextInt(501) + 100) - x;

height = (rand.nextInt(301) + 100) - y;

page.setColor(Color.***cyan***);

page.drawRect(x, y, width, height);

x = rand.nextInt(401);

y = rand.nextInt(201);

width = (rand.nextInt(501) + 100) - x;

height = (rand.nextInt(301) + 100) - y;

page.setColor(Color.***magenta***);

page.drawRect(x, y, width, height);

}

// -----------------------------------------------------------------

// Creates the main frame of the program.

// -----------------------------------------------------------------

**public** **static** **void** main(String[] args) {

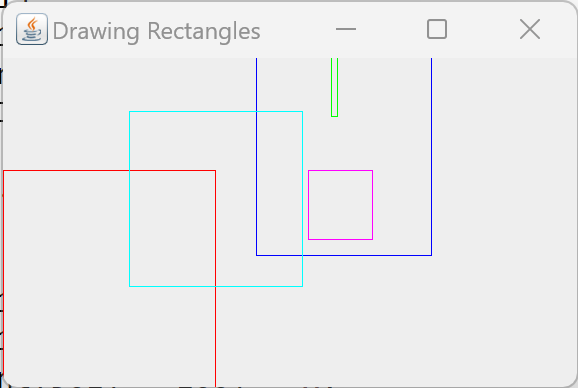
JFrame frame = **new** DrawingRectangleApp();

frame.setVisible(**true**);

frame.repaint();

}

}

Input/output below:  
  


*Add more exercises as needed*

Exercise 4 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

**package** pa4;

//Class Roulette for CSCI 145 PA 4 Spring 2023

//Modified by: Ivan Leung

/\* Java Class: CSCI 145

Modified by: Ivan Leung

Class: Mon/Wed

Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

**import** java.util.\*;

//Class Roulette represents a roulette betting game.

**class** Roulette {

// public name constants -- accessible to others

**public** **final** **static** **int** ***BLACK*** = 0; // even numbers

**public** **final** **static** **int** ***RED*** = 1; // odd numbers

**public** **final** **static** **int** ***GREEN*** = 2; // 00 OR 0

**public** **final** **static** **int** ***NUMBER*** = 3; // number bet

**public** **final** **static** **int** ***MIN\_NUM*** = 1; // smallest number to bet

**public** **final** **static** **int** ***MAX\_NUM*** = 36; // largest number to bet

**public** **final** **static** **int** ***MIN\_BET*** = 1; // minimum amount to bet

// private name constants -- internal use only

**private** **final** **static** **int** ***MAX\_POSITIONS*** = ***MAX\_NUM*** + 2; // number of positions on wheel

**private** **final** **static** **int** ***NUMBER\_PAYOFF*** = ***MAX\_NUM*** - 1; // payoff for number bet

**private** **final** **static** **int** ***COLOR\_PAYOFF*** = 2; // payoff for color bet

// private variables -- internal use only

**private** **static** **int** *ballPosition* = 0; // 00, 0, 1 .. MAX\_NUM

**private** **static** **int** *color* = ***GREEN***; // GREEN, RED, OR BLACK

// private variables -- testing only

**private** **static** **int** *next* = 0; // next value in the list

**private** **static** **int**[] *randValues* = { 20, 5, 0, 1, 36 }; // 5 values

// Contains the main processing loop for the roulette game.

**public** **static** **void** main(String[] args) {

Scanner scan = **new** Scanner(System.***in***);

Player player = **new** Player("Jane", 100); // $100 to start for Jane

**boolean** done = **false**;

**int** currentSpin;

System.***out***.println("Author: [Your Name]\n");

*welcomeMessage*();

**while** (!done) {

System.***out***.println("Money available for " + player.getName() + ": " + player.getMoney());

*betOptions*();

// Add code so player can make a bet

player.makeBet(scan);

// spin() and display value

currentSpin = *spin*();

System.***out***.println("Spinning ...");

System.***out***.println("Current number: " + currentSpin);

// Assume player lost a bet so no payment at this point

done = !player.playAgain(scan);

System.***out***.println();

}

System.***out***.println("Game over! Thanks for playing.");

scan.close();

}

// =====================================================================

// Presents welcome message

// =====================================================================

**public** **static** **void** welcomeMessage() {

System.***out***.println("Welcome to a simple version of roulette game.");

System.***out***.println("You can place a bet on black, red, or a number.");

System.***out***.println("A color bet is paid " + ***COLOR\_PAYOFF*** + " times the bet amount.");

System.***out***.println("A number bet is paid " + ***NUMBER\_PAYOFF*** + " times the bet amount.");

System.***out***.println("You can bet on a number from " + ***MIN\_NUM*** + " to " + ***MAX\_NUM*** + ".");

System.***out***.println("Gamble responsibly. Have fun and good luck!\n");

}

// =====================================================================

// Presents betting options

// =====================================================================

**public** **static** **void** betOptions() {

System.***out***.println("Betting Options:");

System.***out***.println(" 1. Bet on black (even numbers)");

System.***out***.println(" 2. Bet on red (odd numbers)");

System.***out***.println(" 3. Bet on a number between " + ***MIN\_NUM*** + " and " + ***MAX\_NUM***);

System.***out***.println();

}

// Spins the wheel

**public** **static** **int** spin() {

**int** result;

// use nextRandom() for testing now

result = *nextRandom*();

**return** result;

// comment above code and add your code to spin

}

// Payoff method for number bet

**public** **static** **int** payoff(**int** betAmt, **int** betType, **int** numberBet) {

**int** pay = 0;

**return** pay;

}

// Returns a simulated "random" value for testing

// Assume a value between 0 and 36

**public** **static** **int** nextRandom() {

**int** num = *randValues*[*next*];

*next*++;

*next* = *next* % *randValues*.length; // back to 0 if needed

**return** num;

}

}

**package** pa4;

//Class Player for CSCI 145 PA 4 Spring 2023

//Modified by: Ivan Leung

/\* Java Class: CSCI 145

Modified by: Ivan Leung

Class: Mon/Wed

Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

**import** java.util.\*;

//Class Player represents one roulette player.

**class** Player {

**private** **static** **final** **int** ***RELOAD\_AMOUNT*** = 100;

**private** **int** bet, money, betType, number;

**private** String name;

// The Player constructor sets up name and initial available money.

**public** Player(String playerName, **int** initialMoney) {

name = playerName;

money = initialMoney;

}

// Returns this player's name.

**public** String getName() {

**return** name;

}

// Returns this player's current available money.

**public** **int** getMoney() {

**return** money;

}

// Prompts the user and reads betting information.

**public** **void** makeBet(Scanner scan) {

System.***out***.print("Enter a bet option, " + name + " (1, 2, or 3): ");

betType = scan.nextInt();

System.***out***.print("How much to bet: ");

bet = scan.nextInt();

money = money - bet;

}

// Determines if the player wants to play again.

**public** **boolean** playAgain(Scanner scan) {

String answer;

System.***out***.print("Play again, " + name + "? [y/n] ");

answer = scan.next();

**return** (answer.equals("y") || answer.equals("Y"));

}

// payment method (determines winnings)

**public** **int** payment() {

**return** 0;

}

}

Input/output below:  
  
Author: [Your Name]

Welcome to a simple version of roulette game.

You can place a bet on black, red, or a number.

A color bet is paid 2 times the bet amount.

A number bet is paid 35 times the bet amount.

You can bet on a number from 1 to 36.

Gamble responsibly. Have fun and good luck!

Money available for Jane: 100

Betting Options:

1. Bet on black (even numbers)

2. Bet on red (odd numbers)

3. Bet on a number between 1 and 36

Enter a bet option, Jane (1, 2, or 3): 1

How much to bet: 100

Spinning ...

Current number: 20

Play again, Jane? [y/n] n

Game over! Thanks for playing.

Answer for Question 1

Constructor is used to initialize instance data. The main difference between other methods is that it can only be called once only when an object is created. Also, the constructor must have the same name as the class name, and it does not have a return type as it cannot return any values.

Answer for Question 2  
 The import components inside a Java class include instance data, constructor, and method. My way to learn more about an existing Java class is identifies all the components int the class. Then, I would look at the comment on how each instance data, and methods work. Last, I would run the program to see what it does.

Extra Credit – provide if applicable

Pseudocode below if applicable:

Source code below:

**package** pa4;

/\* Java Class: CSCI 145

Author: Ivan Leung

Class: Mon/Wed

Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

**public** **class** BandBooster {

**public** BandBooster(String name) {

**this**.name = name;

boxesSold = 0;

}

**public** String getName() {

**return** **this**.name;

}

**public** **void** updateSales(**int** boxesSold) {

**this**.boxesSold += boxesSold;

}

**public** String toString() {

**return** **this**.name + ": " + **this**.boxesSold + " boxes";

}

**private** String name;

**private** **int** boxesSold;

}

**package** pa4;

/\* Java Class: CSCI 145

Author: Ivan Leung

Class: Mon/Wed

Date: Mar 14 2023

Description:

I certify that the code below is my own work.

Exception(s): N/A

\*/

**import** java.util.Scanner;

**public** **class** TestBandBooster {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

Scanner scan = **new** Scanner(System.***in***);

BandBooster sales1 = **new** BandBooster("John");

BandBooster sales2 = **new** BandBooster("Mary");

System.***out***.print("Enter the number of boxes sold by " + sales1.getName() + " the first week: ");

sales1.updateSales(scan.nextInt());

System.***out***.print("Enter the number of boxes sold by " + sales1.getName() + " the second week: ");

sales1.updateSales(scan.nextInt());

System.***out***.print("Enter the number of boxes sold by " + sales1.getName() + " the last week: ");

sales1.updateSales(scan.nextInt());

System.***out***.print("Enter the number of boxes sold by " + sales2.getName() + " the first week: ");

sales2.updateSales(scan.nextInt());

System.***out***.print("Enter the number of boxes sold by " + sales2.getName() + " the second week: ");

sales2.updateSales(scan.nextInt());

System.***out***.print("Enter the number of boxes sold by " + sales2.getName() + " the last week: ");

sales2.updateSales(scan.nextInt());

System.***out***.println();

System.***out***.printf("%s%n%s", sales1, sales2);

}

}

Input/output below:  
  
Enter the number of boxes sold by John the first week: 39

Enter the number of boxes sold by John the second week: 40

Enter the number of boxes sold by John the last week: 89

Enter the number of boxes sold by Mary the first week: 10

Enter the number of boxes sold by Mary the second week: 39

Enter the number of boxes sold by Mary the last week: 50

John: 168 boxes

Mary: 99 boxes