CSC 210.03, WED 11/18/2019, 12:35 – 1:45 PM

Midterm Exam 2 Wednesday: 100 points

Show your work on Answer Sheet "Midterm Exam 2 Wednesday Answer Sheet". Your writing must be clear and readable to the grader(s).

HONOR CODE: - Please follow CS Department's policies: https://cs.sfsu.edu/cheating-and-plagiarism-policy

Use this code below for 1a – 1d. Please do not write within the code below

```
public class Test {
        public static void main(String[] args) {
A.                  Employee x = new Employee("Nancy");
B.                  System.out.println(Employee.employeeCount);

D.                  // The statement you write in "d." above will be
placed here

E.                  //x.setEmployeeName("George");
        }
}
class Employee{
        private String employeeName;

        static int employeeCount=0;
//        constructor you enter in "a." will be placed here

//        the getter method for employeeName will be placed here

//        the setter method from "e." will be placed here

}
```

1a- 1e 20 points. Complete the following prompts

(Hint: If you think there will be a compile error, just write "error")

1a.-4 points Define the constructor that would make the statement on "A." in main valid

1b.-4 points Write the code in Employee class to keep track of each new object, i.e. employeeCount is incremented by 1, every time a new object is created. For ex. the value of line "B." should be 1

1c.-4 points Define a getter method for employeeName for class Employee

1d.-4 points. Using the getter method created in c, write a statement in main to print the employeeName

1e.-4points Define the setter method that will make the statement on line "E." in main valid.

2a – 2d 16 points

2a.-3 points Write the value-returning method: returnGreeting

- When "Coding" is passed to this method, it returns "Happy Coding!"

- Write a statement to invoke it in the main method.

2b.-3 points Write the void method: makeGreeting

- When "Coding" is passed to this method, it prints "Happy Coding!"

- Write a statement to invoke it in the main method.

2c.-3 points Write the void method: displayGreeting

- This method when invoked prints: "Happy Coding!"

- Write a statement to invoke it in the main method.

2d.- 7 points Write a complete Java program: GreetingHub

- This program prompts users to enter input. If users enter "Coding", the program displays "Happy Coding!"

- This program must have at least 2 methods. (1 of them is the main method.)

- The output must be identical to the output below:

Enter the event: Coding

Happy Coding!

3a – 3f 25 points

Please use the code below for questions 3a-3d. Please provide answers to the questions in the empty space following each question. Do not write within the code below.

```
public class SFSUClubDriver {
        public static void main(String[] args) {
//...
        }
}
public class SFSUClub {
// ...
        private String name;
        private int numOfMembers;
//...
}
```

3a.-5 points In class SFSUClub, code a data field to keep track of the number of objects created.

Indicate clearly if you will make the data field private or public, non-static or static?

Please also explain in detail how the data field should be used. Write code of how you would use it.

3b.-5 points Write a no-argument constructor and a two-argument constructor.

3c.-5 points Code instructions to create 2 objects using both constructors above that would go in the main.

Please also explain in detail how each of the constructors should be used.

3d.-6 points Write a getter and setter method for name and numOfMembers

3e.-2 points When should data fields be private?

3f. -2 points When should data field be static?

4.-2 points Explain your understanding of encapsulation and data abstraction.

5.- 2 points If you do not write any additional constructor for class CSC210Exam below, note that it already has a constructor of 1 parameter, will Java give the class a constructor?

Circle

YES

or

NO

If yes, what is it called? What does it look like?

```
public class CSC210Exam {
   // Static Variables

   // Instance Variables

   // Contructor

   public CSC210Exam(String examName) {
       this.examName = examName;

   }
   // Static Methods

   // Instance Methods

}
```

6a-6c. 10 points

6a.-5 points Write statements to display the contents of the following 2D array. Each row is displayed in a separate new line. Elements are separated by a space. Please use for-loop.

String [][] animalArray = {

{"Ant", "Bat", "Cat", "Dog"},

{"Emu", "Fox", "Gar"},

{"Hare", "Ibis"},

{"Jackal"}

};

Example output:

```
Ant Bat Cat Dog
Emu Fox Gar
Hare Ibis
Jackal
```

Please also explain how you have constructed this for loop.

6b.-3 points Given this 2D array, how do you get the number of rows which the array contains? Please write the code for it.

6c.-2 points How do you get the number of columns in the 2nd row of **animalArray** array? Please write the code for

7a - 7e.25 points

7a.-5 points How is a class different from an object/an instance? Please explain.

7b.-5 points Write a getter to get the number of members and name in each club.This is a duplicate of #3d just reference that one or copy & paste it here.

7c.-5 points Write statements to display the contents of the following 1D array using the getter in 7b. Please use for-loop.

SFSUClub c1 = new SFSUClub("Black Excellence in STEM", 80);

SFSUClub c2 = new SFSUClub("Society of Women Engineers", 70);

SFSUClub c3 = new SFSUClub("ACM", 60);

SFSUClub[] clubArray = {c1,c2,c3};

Example output:

```
Black Excellence in STEM 80
Society of Women Engineers 70
ACM 60
```

7d.-5 points Write a method in your main class (not in the SFSUClub class) that accepts as parameter the SFSUClub objects array parameter and returns the double average of all club members. Please use a loop. See below image for placement of this method

7e.-5 points Write a statement that would go in the main method that calls the method written in 7c and prints out the average with 2 decimals.

```
public class MainClass {

        public static void main(String[] args){
                //7C--------
        }

        //7D----------
}


public class SFSUClub {
}
    private String name;
        private int numOfMembers;
   // Static Variables

   // Instance Variables

   // Constructor


   // Static Methods

   // Instance Methods
        7B------------


}
```