DIP in IT

DIT 409 Java programming

**Instructions:**

All programs should be written, and linked to an online repository like GitHub.

A video to get you started with GitHub has been posted on Moodle.

After completing your assignment, post the link on the link on Moodle. An instructor will follow the posted link to access and grade your work.

Note that: Your program should always be well-commented. At the top of your assignment file, you should write a short description of what your program does and add other comments to help in explaining your code.

All of your variables should be given a deceptive name. Avoid giving your variables names like a, b, I, x, y etc.

In case you copy your friend's work, you both get a Zero (0).

**Task one: Deadline 12th November, 2022**

**Section 1:**

1. Write a Java program that asks the user to enter their sir name and current age then print the number of characters of their sir name and even or odd depending on their age number.

Example of Expected result:

If sir name is Saruni and age is 29, output will be;

then the number of characters is 6.

Your current age is an odd number

1. Write Java program to ask student to enter the marks of the five units they did last semester, compute the average and display it on the screen. (Average should be given in two decimal places).
2. Write a program that will help kids learn divisibly test of numbers of integers. The program should check whether the given integer is divisible by integers in the range of 0-9. For example, if a number (955) is divisible by five, the program should print, the number is divisible by 5 because it ends with a 5, and 900 is divisible by 5 because it ends with a 0(zero).
3. Write a Java program to display all the multiples of 2, 3 and 7 within the range 71 to 150.
4. Create a calculator using java to help user perform the basic operations (+, -, \* and /).
   1. User should be asked to enter a number, then an operation, the program computes the operation and display the output to the computer screen.

**Section 2:**

**Task two: assignment on methods Deadline 12th November, 2022**

**Instructions**

*Answer all the questions.*

*Each question is five marks.*

***QUESTION ONE:***

Create a java project, name it methods\_in\_java, in the project create a package named java\_methods and in the package, create a class and named methods.

b. in the classmethods, write a method that asks user to enter three numbers, using if statement determine the largest number, the smallest number and display the results in the following format.   
The smallest number: ?  
The largest number number: ?  
? is your largest and ? smallest number.

***QUESTION 2:***

Create a java project, package and class. In the class, write a method that asks a lecturer to enter marks for three units, java programming, networking and maths. The method should compute the average marks for three units and output the data in the following format.

marks for java programming is: ?  
marks for networking is: ?

marks for maths is: ?

the average is: ?

***QUESTION 3:***

Write a method that asks user to enter the year, the program should check if the year is a leap year, and output the text the year you entered is a leap year.

Create a java project, a package and a class, in the class, write a program to calculate the area of a triangle. The program should have thee non-static methods:

One of the methods should ask the user to enter the base and the height of a triangle.

The other method should compute the area of the rectangle.

The other method should output the calculated area of the triangle an display it to the user.

***QUESTION 4***

Create a java program that has one non-static method, two static methods and a constructor.

***Task Three: Deadline 18th November 2022***

1. Explain the differences between primitive and reference data types.
2. Define the scope of a variable (hint: local and global variable)
3. Why is initialization of variables required.
4. Differentiate between static, instance and local variables.
5. Differentiate between widening and narrowing casting in java.
6. the following table shows data type, its size, default value and the range. Filling in the missing values.

|  |  |  |  |
| --- | --- | --- | --- |
| **TYPE** | **SIZE (IN BYTES)** | **DEFAULT** | **RANGE** |
| boolean | 1 bit |  | true, false |
| Char | 2 |  | ‘\0000’ to ‘\ffff’ |
| Byte |  | 0 | -27 to +27-1 |
| Short |  | 0 | -215 to +215-1 |
| Int | 4 |  | -231 to +231-1 |
| Long |  | 0L | - |
| Float | 4 | 00.0f |  |
| Double | 8 |  | -1.8E+308 to +1.8E+308 |

1. Explain the importance of using Java packages
2. Explain three controls used when creating GUI applications in Java language.
3. Explain the difference between containers and components as used in Java.
4. Write a Java program to reverse an array having five items of type int.
5. Programs written for a graphical user interface have to deal with “events.”

Explain what is meant by the term event.

Give at least two different examples of events, and discuss how a program might

respond to those events.

1. Explain the difference between the following terms as used in Java programming.

Polymorphism and encapsulation

method overloading and method overriding

class and interface

inheritance and polymorphism

1. sing examples, explain the two possible ways of implementing polymorphism. Show your code in java.

1. With relevant examples, explain the following concepts as used in Java programming.

a. Mutable classes.

Explain what is meant by mutable class

Write a program that implements the concept of mutable class

b. Immutable classes.

Explain what is meant by immutable class

Write a program that implements the concept of immutable class

c. Explain the situations where mutable classes are more preferable than immutable classes when writing a Java program.

2. Explain what a String buffer class is as used in Java

the syntax of creating an object of StringBuffer class

Explain the methods in the StringBuffer class

b. Write the output of the following program.

class Myoutput

1. {
2. public static void main(String args[])
3. {
4. String ast = "hello i love java";
5. System.out.println(ast.indexOf('e')+" "+ast.indexOf('ast')+" "+ast.lastIndexOf('l')+" "+ast .lastIndexOf('v'));
6. }
7. }

c. Explain your answer in (2b) above.

d. With explanation, write the output of the following program.

class Myoutput

1. {
2. public static void main(String args[])
3. {
4. StringBuffer bfobj = new StringBuffer("Jambo");
5. StringBuffer bfobj1 = new StringBuffer(" Kenya");
6. c.append(bfobj1);
7. System.out.println(bfobj);
8. }
9. }

e. With explanation, write the output of the following program.

class Myoutput

1. {
2. public static void main(String args[])
3. {
4. StringBuffer str1 = new StringBuffer("Jambo");
5. StringBuffer str2 = str1.reverse();
6. System.out.println(str2);
7. }
8. }

f. With explanation, write the output of the following program.

**class Myoutput**

1. {
2. class output
3. {
4. public static void main(String args[])
5. {
6. char c[]={'A', '1', 'b' ,' ' ,'a' , '0'};
7. for (int i = 0; i < 5; ++i)
8. {
9. i++;
10. if(Character.isDigit(c[i]))
11. System.out.println(c[i]+" is a digit");
12. if(Character.isWhitespace(c[i]))
13. System.out.println(c[i]+" is a Whitespace character");
14. if(Character.isUpperCase(c[i]))
15. System.out.println(c[i]+" is an Upper case Letter");
16. if(Character.isLowerCase(c[i]))
17. System.out.println(c[i]+" is a lower case Letter");
18. i++;
19. }
20. }
21. }

***Task Four: Deadline 25th November 2022***

PART 1:

1. Write a Java program that takes 15 values of type integer as inputs from user, store the values in an array.

a) Print the values stored in the array on screen.  
b) Ask user to enter a number, check if that number (entered by user) is present in array

or not. If it is present print, “the number found at index (index of the number) ” and the text “number not found in this array”

1. A prime number is a number that is evenly divisible only by itself and 1. For example, the number 5 is prime because it can be evenly divided only by 1 and 5. The number 6, however, is not prime because it can be divided evenly by 1, 2, 4, and 6.   
   Write a method named isPrime, which takes an integer as an argument and returns true if the argument is a prime number, or false otherwise. Also write main method that displays prime numbers between 1 to 500.

Part 2:

Design the following registration and login forms using java. Make sure to use the most appropriate layout.



