North South University

Department of Electrical and Computer Engineering

CSE 215L: Programming Language II Lab

Lab – 5: Methods

Learning Objectives:

- to learn about methods in detail (defining a method, calling a method, passing arguments by values, overloading methods, the scope of variables, method abstraction)
- to design and implement methods for problem solving

Ex-1: Simple Method Examples

```
import java.util.Scanner;
public class Main {
  public static void main(String[] args) {
    printHello();
    System.out.println("Input number: " + printInput());
  }

  public static void printHello() {
    System.out.println("Hello World");
  }

  public static int printInput() {
    Scanner input = new Scanner(System.in);

    System.out.print("Enter an int value: ");
    int intValue = input.nextInt();

    return intValue;
  }
}
```

Ex-2: Method with no return value

```
public class Main {
  public static void main(String[] args) {
    int a = 5, b = 3;

    max(a, b);
  }

  public static void max(int n1, int n2) {
    int result = (n1 > n2) ? n1: n2;

    System.out.println("Maximum of " + n1 + " and " +
n2 + " is: " + result);
  }
}
```

Ex-3: Method with a return value

```
public class Main {
  public static void main(String[] args) {
    int a = 5, b = 3;
    int k = max(a, b);

    System.out.println("Maximum of " + a + " and " + b
+ " is: " + k);
  }

  public static int max(int n1, int n2) {
    int result = (n1 > n2) ? n1: n2;
    return result;
  }
}
```

Ex-4: Overloading a method (related to Ex-3)

```
public class Main {
  public static void main(String[] args) {
    double a = -5.3, b = 3.2;
    double k = max(a, b);

    System.out.println("Maximum of " + a + " and " + b
+ " is: " + k);
  }

  public static double max(double n1, double n2) {
    double result = (n1 > n2) ? n1: n2;
    return result;
  }
}
```

Lab Task:

1. Write a method that generates a random year between 1995 and 2022 and displays if it is a leap year or not using the following header:

    public static void printYearStatus()

Write a test program that invokes the printYearStatus method to display the status of a year. [Hint: A leap year must be divisible by 400 or divisible by 4 and not divisible by 100]

2. Write a method that returns the area of a pentagon using the following header:

    public static double areaOfPentagon(double side)

The area of a pentagon can be computed using the following formula:

$$Area = \frac{n \; x \; s2}{4 \; x \; tan(\frac{\Pi}{n})}$$

Write a test program that prompts the user to enter the side of a pentagon and displays its area (upto 3 decimal points).

3. Write a method that returns the prime status of an integer using the following header:

    public static boolean isPrime(int a)

Write a test program that prompts the user to enter an integer and checks if it is prime or not.

4. Write a method that returns the GCD (Greatest Common Divisor) of the two integers using the following header:

    public static int findGCD(int a, int b)

Write a test program that prompts the user to enter two integers and displays their GCD.

5. Write two methods those respectively count the number of uppercase and lowercase letters in a string using the following header:

    public static int countLowercaseLetters(String s1)
    public static int countUppercaseLetters(String s1)

Write a test program that prompts the user to enter a string and displays the number of uppercase and lowercase letters in that string.