Fakultas Ilmu Komputer, Universitas Indonesia
Foundations of Programming (Dasar-Dasar Pemrograman) 2
Worksheet 02 – Feb 2023

1. What's wrong with this program?

```
public class Overloading {
    public static void main(String[] args) {
        System.out.println(max(1, 2));
    }
    public static double max(int num1, double num2) {
        if (num1 > num2) return num1;
        else return num2;
    }
    public static double max(double num1, int num2) {
        if (num1 < num2) return num2;
        else return num1;
    }
}
```

2.

(*Sum the digits in an integer*) Write a method that computes the sum of the digits in an integer. Use the following method header:

```
public static int sumDigits(long n)
```

For example, `sumDigits(234)` returns `9` (= 2 + 3 + 4). (*Hint*: Use the `%` operator to extract digits and the `/` operator to remove the extracted digit. For instance, to extract 4 from 234, use `234 % 10` (= 4). To remove 4 from 234, use `234 / 10` (= 23). Use a loop to repeatedly extract and remove the digit until all the digits are extracted. Write a test program that prompts the user to enter an integer then displays the sum of all its digits.

3.

(*Sum series*) Write a method to compute the following series:

$$m(i) = \frac{1}{3} + \frac{2}{4} + \cdots + \frac{i}{i+2}$$

Write a test program that displays the following table:

I	m(i)
1	0.3333
2	0.8333
...	
19	14.7093
20	15.6184

4. Fill in the missing parts according to the comments.

```
public class Problem4 {
  public static void main( String[] args ) {
    //create an array for storing 100 integers




    //initialize the array with numbers 2, 4, ..., 200




    //print the contents of the array in reverse order:
    //200, 198, ..., 2



  }
}
```

5. Find the output printed by this program.

```
public class Problem5 {
  public static void main(String[] args) {
    char[] str = {'m','e','r','a','p','i'};
    int p = str.length - 1;
    for (int i = 0; i <= p; i++) {
      str[i] = str[p-i];
    }
    for (char c: str) {
      System.out.print(c);
    }
    System.out.println();
    int k = 1;
    do {
      k = k*4;
    } while (k < 100);
    System.out.println("k: " + k);
  }
}
```

Answer:

6. Show the results of the following programs.

```java
public class Test {
  public static void main(String[] args) {
    int max = 0;
    max(1, 2, max);
    System.out.println(max);
  }

  public static void max(
      int value1, int value2, int max) {
    if (value1 > value2)
      max = value1;
    else
      max = value2;
  }
}
```

(a)

```java
public class Test {
  public static void main(String[] args) {
    int i = 1;
    while (i <= 6) {
      method1(i, 2);
      i++;
    }
  }

  public static void method1(
      int i, int num) {
    for (int j = 1; j <= i; j++) {
      System.out.print(num + " ");
      num *= 2;
    }

    System.out.println();
  }
}
```

(b)

```java
public class Test {
  public static void main(String[] args) {
    // Initialize times
    int times = 3;
    System.out.println("Before the call,"
      + " variable times is " + times);

    // Invoke nPrintln and display times
    nPrintln("Welcome to Java!", times);
    System.out.println("After the call,"
      + " variable times is " + times);
  }

  // Print the message n times
  public static void nPrintln(
      String message, int n) {
    while (n > 0) {
      System.out.println("n = " + n);
      System.out.println(message);
      n--;
    }
  }
}
```

(c)

```java
public class Test {
  public static void main(String[] args) {
    int i = 0;
    while (i <= 4) {
      method1(i);
      i++;
    }

    System.out.println("i is " + i);
  }

  public static void method1(int i) {
    do {
      if (i % 3 != 0)
        System.out.print(i + " ");
      i--;
    }
    while (i >= 1);

    System.out.println();
  }
}
```

(d)