

University of Petra	 جامعة البترا University of Petra	 30 Year Anniversary جامعة البترا - ثلاثون عاما University of Petra
Faculty of Information Technology		كلية تكنولوجيا المعلومات
Department of Computer Science		قسم علم الحاسوب

**Information Technology Fundamentals Lab**

**601106**

**Final Exam – 2025 (1)**

**Form A**

**Your Name:** .....

**Your ID:** .....

**Your Instructor Name:** .....

**Instructions for the Exam:**

- Write your name and ID number on the exam and answer sheets.
- Write the number of the section that you enrolled in.
- Write the name of your instructor.
- Questions in the exam not allowed.
- Using any type of technology (mobiles, smart watches) not allowed
- Using extra papers or sheets not allowed.
- The exam consists of three questions.
- Read the questions from the exam paper and answer on VS Code.
- Compress your answer file and submit the compressed file to Moodle.

**For instructor use only:**

Question number	Course ILO	Program ILO	Question weight	Student mark
<b>Q1</b>	<b>P1</b>		<b>17</b>	
<b>Q2</b>	<b>P2</b>		<b>20</b>	
<b>Q3</b>	<b>P2</b>		<b>8</b>	
			<b>Total /45</b>	

**Question 1:** Write a program that meets the following requirements: **(17 Marks)**

- Declare a method to determine whether an integer is a prime number. Use the following method header:

```
public static boolean isPrime(int num)
```

An integer greater than 1 is a prime number if its only divisor is 1 or itself. For example, `isPrime(11)` returns `true`, and `isPrime(9)` returns `false`.

- Call the `isPrime` method from the main method to find the **first 100 prime numbers** and display every **ten prime numbers in a row**.

**Solution:**

```
public class PrimeNumbers { // (1 mark)
    public static boolean isPrime(int num) { // (2 marks)
        for (int i = 2; i <= num-1; i++) { // (2 marks)
            if (num % i == 0) // (2 marks)
                return false; // (1 mark)
        }
        return true; // (1 mark)
    }
    public static void main(String[] args) { // (1 mark)
        int count = 0; // (0.5 mark)
        int number = 2; // (0.5 mark)
        while (count < 100) { // (1 mark)
            if (isPrime(number)) { // (1 mark)
                System.out.print(number + "\t"); // (1 mark)
                count++; // (1 mark)
            }
            if (count % 10 == 0) // (1 mark)
                System.out.println(); // (0.5 mark)
            number++; // (0.5 mark)
        }
    }
}
```

**Question 2:**

**(20 marks)**

**Q2.1** Declare a user-defined method **printShape** that prints the following number pattern based on the value of N:

Example when N = 5:

1

22

333

4444

55555

**Q2.2** Declare another user-defined method named, **switch\_Numbers()** that accepts two numbers, **swaps them**, and displays the swap result.

### Main Method Requirements

The main method contains the following:

- Read a positive integer N from the user.
- Read two integers num1, num2 from the user.
- Call the methods you have declared in **Q2.1** and **Q2.2** with the input N, num1, and num2.

### Solution:

```
import java.util.Scanner; //0.25
public class Test { //0.25
    public static void main(String[] args) { //0.25
        Scanner input = new Scanner(System.in); //0.25
        System.out.print("Enter a positive integer N: "); //0.5
        int N = input.nextInt(); //1
        System.out.print("Enter first number: "); //0.5
        int num1 = input.nextInt(); //1
        System.out.print("Enter second number: "); //0.5
        int num2 = input.nextInt(); //1
        PrintShape(N); //1
        switch_Numbers(num1, num2); //1.5
    }
    public static void PrintShape(int n) { //1.5
        for (int i = 1; i <= n; i++) { //1
            for (int j = 1; j <= i; j++) { //1
                System.out.print(i); //0.5
            }
        }
        System.out.println(); //1
    }
}
```

```

}
public static void switch_Numbers(int a, int b) { //1.5
    int temp = a; //1
    a = b; //1
    b = temp; //1
    System.out.println("After swapping:"); //0.5
    System.out.println("num1 = " + a); //1
    System.out.println("num2 = " + b); //1
}
}
}

```

### Question 3:

(8 marks)

Conversion from kilograms to pounds: Write a program that displays the following table (note that 1 kilogram is 2.2 pounds):

Kilograms	Pounds
1	2.2
3	6.6
...	
197	433.4
199	437.8

### Solution:

```

public class KilogramsToPounds { // (1 mark)
    public static void main(String[] args) { // (1 mark)
        System.out.println("Kilograms\tPounds"); // (1 mark)
        for (int i = 1; i <= 199; i += 2) { // (2 marks)
            double pounds = i * 2.2; // (2 marks)
            System.out.println(i + "\t\t" + pounds); // (1 mark)
        }
    }
}

```