ĐẠI HỌC BÁCH KHOA HÀ NỘI
TRƯỜNG CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG

BÁO CÁO THỰC HÀNH
IT3103-744527-2024.1

BÀI THỰC HÀNH -LAB01

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BÁO CÁO THỰC HÀNH LAB 1

The Very First Java Programs

2.2.1 Write, compile the first Java application:

```java
// Example 1: HelloWorld.java
// Text-printing program

public class HelloWorld {

    Run | Debug
    public static void main(String args[]) {
        System.out.println("Xin chao \ncac ban!");
        System.out.println("Hello \t World!");
    } // end of method main
}
```

Hình 1: Mã nguồn chương trình HelloWorld.java

Kết quả

```java
// Example 1: HelloWorld.java
// Text-printing program

public class HelloWorld {

    Run | Debug
    public static void main(String args[]) {
        System.out.println("Xin chao \ncac ban!");
        System.out.println("Hello \t World!");
    } // end of method main
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\Hung\Documents\GitHub\IT3103.744528.2024.1.202261
ava\jdt_ws\Lab01_7c6669c0\bin' 'HelloWorld'
Xin chao
cac ban!
Hello    World!
```

2.2.2 Write, compile the first dialog Java program

```java
// Example 2: FirstDialog.java

import javax.swing.JOptionPane;

public class FirstDialog {
    Run | Debug
    public static void main(String[] args) {
        JOptionPane.showMessageDialog(null, "Hello Nguyen Dang Phuc Hung! How are you?");
        System.exit(0);
    }
}
```

Hình 2: Mã nguồn chương trình FirstDialog.java

Kết quả

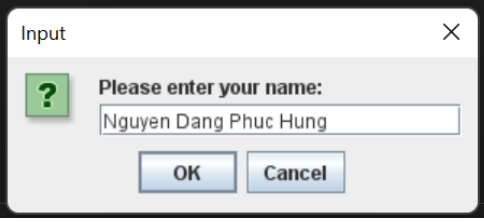
2.2.3 Write, compile the first input dialog Java application

```java
public class HelloNameDialog {
    Run | Debug
    public static void main(String[] args) {
        String result;
        result = JOptionPane.showInputDialog("Please enter your name:");
        JOptionPane.showMessageDialog(null, "Hi " + result + "!");
        System.exit(0);
    }
}
```

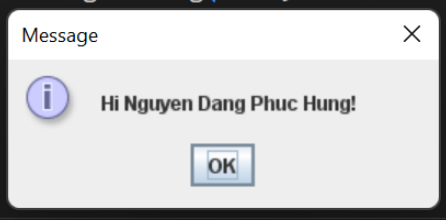
Hình 3: Mã nguồn chương trình HelloNameDialog.java

Kết quả

```java
public class HelloNameDialog {
    Run | Debug
    public static void main(String[] args) {
        String result;
        result = JOptionPane.showInputDialog("Please enter your name:");
        JOptionPane.showMessageDialog(null, "Hi " + result + "!");
        System.exit(0);
    }
}
```




```java
public class HelloNameDialog {
    Run | Debug
    public static void main(String[] args) {
        String result;
        result = JOptionPane.showInputDialog("Please enter your name:");
        JOptionPane.showMessageDialog(null, "Hi " + result + "!");
        System.exit(0);
    }
}
```

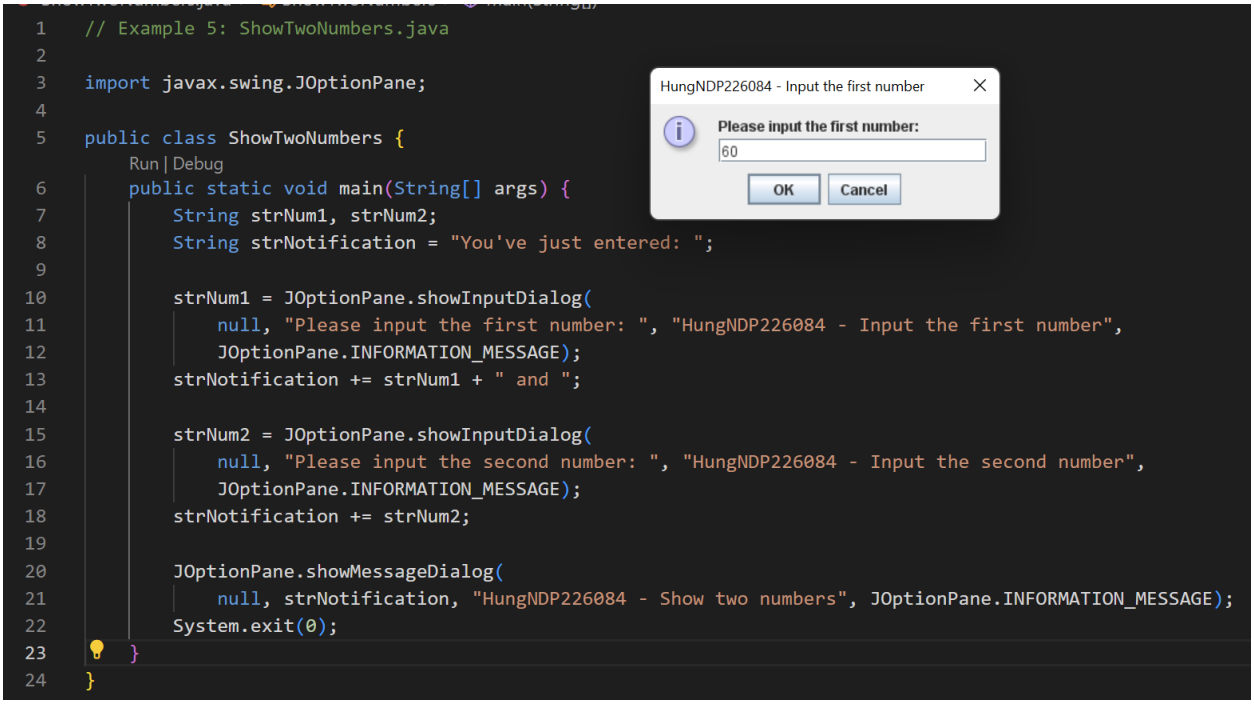


2.2.4 Write, compile, and run the following example:

```java
// Example 5: ShowTwoNumbers.java

import javax.swing.JOptionPane;

public class ShowTwoNumbers {
    Run | Debug
    public static void main(String[] args) {
        String strNum1, strNum2;
        String strNotification = "You've just entered: ";

        strNum1 = JOptionPane.showInputDialog(
            null, "Please input the first number: ", "HungNDP226084 - Input the first number",
            JOptionPane.INFORMATION_MESSAGE);
        strNotification += strNum1 + " and ";

        strNum2 = JOptionPane.showInputDialog(
            null, "Please input the second number: ", "HungNDP226084 - Input the second number",
            JOptionPane.INFORMATION_MESSAGE);
        strNotification += strNum2;

        JOptionPane.showMessageDialog(
            null, strNotification, "HungNDP226084 - Show two numbers", JOptionPane.INFORMATION_MESSAGE);
        System.exit(0);
    }
}
```

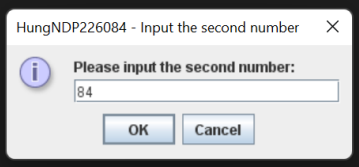
Hình 4: Mã nguồn chương trình ShowTwoNumbers.java

Kết quả



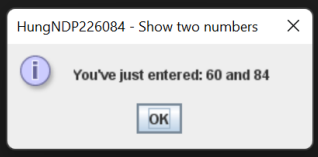
ShowTwoNumbers.java > ShowTwoNumbers > main(String[])

```java
// Example 5: ShowTwoNumbers.java

import javax.swing.JOptionPane;

public class ShowTwoNumbers {
    Run | Debug
    public static void main(String[] args) {
        String strNum1, strNum2;
        String strNotification = "You've just entered: ";

        strNum1 = JOptionPane.showInputDialog(
            null, "Please input the first number: ", "HungNDP226084 - Input the first number",
            JOptionPane.INFORMATION_MESSAGE);
        strNotification += strNum1 + " and ";

        strNum2 = JOptionPane.showInputDialog(
            null, "Please input the second number: ", "HungNDP226084 - Input the second number",
            JOptionPane.INFORMATION_MESSAGE);
        strNotification += strNum2;

        JOptionPane.showMessageDialog(
            null, strNotification, "HungNDP226084 - Show two numbers", JOptionPane.INFORMATION_MESSAGE);
        System.exit(0);
    }
}
```



ShowTwoNumbers.java > ShowTwoNumbers > main(String[])

```java
// Example 5: ShowTwoNumbers.java

import javax.swing.JOptionPane;

public class ShowTwoNumbers {
    Run | Debug
    public static void main(String[] args) {
        String strNum1, strNum2;
        String strNotification = "You've just entered: ";

        strNum1 = JOptionPane.showInputDialog(
            null, "Please input the first number: ", "HungNDP226084 - Input the first number",
            JOptionPane.INFORMATION_MESSAGE);
        strNotification += strNum1 + " and ";

        strNum2 = JOptionPane.showInputDialog(
            null, "Please input the second number: ", "HungNDP226084 - Input the second number",
            JOptionPane.INFORMATION_MESSAGE);
        strNotification += strNum2;

        JOptionPane.showMessageDialog(
            null, strNotification, "HungNDP226084 - Show two numbers", JOptionPane.INFORMATION_MESSAGE);
        System.exit(0);
    }
}
```



BÀI TẬP

2.2.5 Write a program to calculate sum, difference, product, and quotient of 2 double numbers which are entered by users.

```java
// 2.2.5: Write a program to calculate sum, difference, product, and quotient of 2 double numbers which are entered by users.
// CalcTwoDoubles.java

import java.util.Scanner;

public class CalcTwoDoubles {
    Run | Debug
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Input a = ");
        Double num1 = sc.nextDouble();

        System.out.print("Input b = ");
        Double num2 = sc.nextDouble();

        // Caculate sum, difference and product of the 2 numbers
        Double sum, dif_hungndp, product, quotient;
        sum = num1 + num2;
        dif_hungndp = num1 - num2;
        product = num1 * num2;

        // Output sum, difference and sum
        System.out.println(num1 + " + " + num2 + " = " + sum);
        System.out.println(num1 + " - " + num2 + " = " + dif_hungndp);
        System.out.println(num1 + " * " + num2 + " = " + product);

        // Calculate quotient of the 2 numbers and output
        if (num2 == 0.0) {
            System.out.println(num1 + " is not divisible by " + num2 + ".");
        } else {
            quotient = num1 / num2;
            System.out.println(num1 + " / " + num2 + " = " + quotient);
        }

        sc.close();
    }
}
```

Hình 5: Mã nguồn chương trình CalcTwoDoubles

Kết quả

```java
// 2.2.5: Write a program to calculate sum, difference, product, and quotient of 2 double numbers which are entered by users.
// CalcTwoDoubles.java

import java.util.Scanner;

public class CalcTwoDoubles {
    Run | Debug
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Input a = ");
        Double num1 = sc.nextDouble();

        System.out.print("Input b = ");
        Double num2 = sc.nextDouble();

        // Caculate sum, difference and product of the 2 numbers
        Double sum, dif_hungndp, product, quotient;
        sum = num1 + num2;
        dif_hungndp = num1 - num2;
        product = num1 * num2;

        // Output sum, difference and sum
        System.out.println(num1 + " + " + num2 + " = " + sum);
        System.out.println(num1 + " - " + num2 + " = " + dif_hungndp);
        System.out.println(num1 + " * " + num2 + " = " + product);

        // Calculate quotient of the 2 numbers and output
        if (num2 == 0.0) {
            System.out.println(num1 + " is not divisible by " + num2 + ".");
        } else {
            quotient = num1 / num2;
            System.out.println(num1 + " / " + num2 + " = " + quotient);
        }

        sc.close();
    }
}
```

```
PROBLEMS 2  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\Hung\Documents\GitHub\IT3103.744528.2024.1.20226104.NguyenDangPhucHung\Lab01>  & 'C:\Program Files\Java\jre-1.8\bin\java.exe' '-c
ava\jdt_ws\jdt.ls-java-project\bin' 'CalcTwoDoubles'
Input a = 70
Input b = 32
70.0 + 32.0 = 102.0
70.0 - 32.0 = 38.0
70.0 * 32.0 = 2240.0
70.0 / 32.0 = 2.1875
PS C:\Users\Hung\Documents\GitHub\IT3103.744528.2024.1.20226104.NguyenDangPhucHung\Lab01>
```

2.2.6 Write a program to solve linear equation with one variable, linear system with two variables and second-degree equation with one variable.

```java
// 2.2.6: Write a program to solve linear equation, linear system and second-degree equation.
// EquationSolver.java

import java.util.Scanner;
import java.lang.Math;

public class EquationSolver {
    Run | Debug
    public static void main(String[] args) {
        // Initialize Scanner object
        Scanner sc = new Scanner(System.in);

        // GIAI PHUONG TRINH TUYEN TINH BAC NHAT
        System.out.println("==============================");
        System.out.println("Giai phuong trinh a * x + b = 0");

        // Nhap a, b tu ban phim
        System.out.print("Input a = ");
        Double a_hungndp = sc.nextDouble();

        System.out.print("Input b = ");
        Double b = sc.nextDouble();

        if (a_hungndp != 0.0) {
            Double result = -b / a_hungndp;
            System.out.println("x = " + result);
        } else {
            if (b == 0.0) {
                System.out.println("Phuong trinh vo so nghiem.");
            } else {
                System.out.println("Phuong trinh vo nghiem.");
            }
        }


        // GIAI HE PHUONG TRINH TUYEN TINH BAC NHAT 2 AN
        System.out.println("==============================");
        System.out.println("Giai he phuong trinh a11 * x1 + a12 * x2 = b1; a21 * x1 + a22 * x2 = b2");

        // Nhap a11, a12, b1, a21, a22, b2 tu ban phim
        System.out.print("Input a11 = ");
        Double a11 = sc.nextDouble();
        System.out.print("Input a12 = ");
        Double a12 = sc.nextDouble();
        System.out.print("Input b1 = ");
        Double b1 = sc.nextDouble();
        System.out.print("Input a21 = ");
        Double a21 = sc.nextDouble();
        System.out.print("Input a22 = ");
        Double a22 = sc.nextDouble();
        System.out.print("Input b2 = ");
```

Hình 6: Mã nguồn chương trình EquationSolver.java (1)

```
        Double b2 = sc.nextDouble();

        // Tinh cac dinh thuc
        Double d = a11 * a22 - a12 * a21;
        Double d1 = b1 * a22 - b2 * a12;
        Double d2 = a11 * b2 - a21 * b1;

        // Giai he phuong trinh
        Double x1, x2;
        if (d != 0.0) {
            x1 = d1 / d;
            x2 = d2 / d;
            System.out.println("x1 = " + x1 + "\nx2 = " + x2);
        } else {
            if (d1 == 0.0 && d2 == 0) {
                System.out.println("He co vo so nghiem.");
            } else {
                System.out.println("He vo nghiem.");
            }
        }
        // GIAI PHUONG TRINH DA THUC BAC 2
        System.out.println("==============================");
        System.out.println("Giai he phuong trinh a * x^2 + b * x + c = 0");

        // Nhap a, b, c tu ban phim
        System.out.print("Input a = ");
        Double a = sc.nextDouble();
        System.out.print("Input b = ");
        Double b_hungndp = sc.nextDouble();
        System.out.print("Input c = ");
        Double c = sc.nextDouble();

        // Tinh delta
        Double delta = b_hungndp * b_hungndp - 4 * a * c;
        if (delta < 0) {

            System.out.println("Phuong trinh vo nghiem.");
        } else if (delta == 0.0) {
            Double result = - b_hungndp / (2 * a);

            System.out.println("Phuong trinh co nghiem kep x1 = x2 = " + result);
        } else {
            Double qx1 = (- b_hungndp - Math.sqrt(delta)) / (2 * a);
            Double qx2 = (- b_hungndp + Math.sqrt(delta)) / (2 * a);

            System.out.println("Phuong trinh co 2 nghiem phan biet:");
            System.out.println("x1 = " + qx1);
            System.out.println("x2 = " + qx2);
        }
        sc.close();
    }
}
```

Hình 7: Mã nguồn chương trình EquationSolver (2)

Kết quả

```
b01>  & 'C:\Program Files\Java\jre-1.8\bin\java.exe' '-cp' 'C:\Users\Hung
==============================
Giai phuong trinh a * x + b = 0
Input a = 1.2
Input b = 0.6
x = -0.5
==============================
Giai he phuong trinh a11 * x1 + a12 * x2 = b1; a21 * x1 + a22 * x2 = b2
Input a11 = 1
Input a12 = 2
Input b1 = 3
Input a21 = 2
Input a22 = 4
Input b2 = 6
He co vo so nghiem.
==============================
Giai he phuong trinh a * x^2 + b * x + c = 0
Input a = 1
Input b = 4
Input c = 10
Phuong trinh vo nghiem.
```

YOUR FIRST JAVA PROJECTS (ECLIPSE IDE)

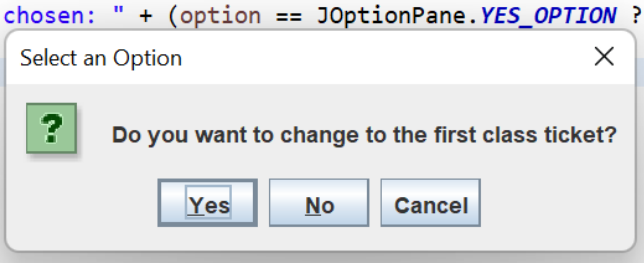
6.1. Write, compile and run the ChoosingOption program.

```java
package choosing_option;
import javax.swing.JOptionPane;

public class ChoosingOption {
    public static void main(String[] args) {
        int option = JOptionPane.showConfirmDialog(null,
        "Do you want to change to the first class ticket?");

        JOptionPane.showMessageDialog(null,
                "You've chosen: " + (option == JOptionPane.YES_OPTION ? "Yes" : "No"));
        System.exit(0);
    }
}
```

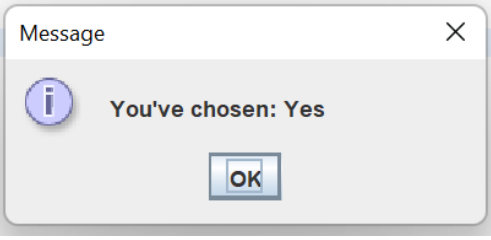
Hình 8: Mã nguồn chương trình ChoosingOption.java

Kết quả

```java
package choosing_option;
import javax.swing.JOptionPane;

public class ChoosingOption {
    public static void main(String[] args) {
        int option = JOptionPane.showConfirmDialog(null,
        "Do you want to change to the first class ticket?");

        JOptionPane.showMessageDialog(null,
                "You've chosen: " + (option == JOptionPane.YES_OPTION ? "Yes" : "No"));
        System.exit(0);
    }
}
```

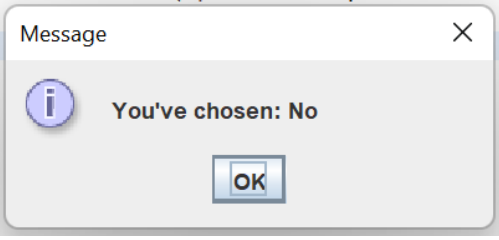



```java
package choosing_option;
import javax.swing.JOptionPane;

public class ChoosingOption {
    public static void main(String[] args) {
        int option = JOptionPane.showConfirmDialog(null,
        "Do you want to change to the first class ticket?");

        JOptionPane.showMessageDialog(null,
                "You've chosen: " + (option == JOptionPane.YES_OPTION ? "Yes" : "No"));
        System.exit(0);
    }
}
```



Hình 9: Kết quả nếu người dùng chọn "Yes"

```java
package choosing_option;
import javax.swing.JOptionPane;

public class ChoosingOption {
    public static void main(String[] args) {
        int option = JOptionPane.showConfirmDialog(null,
        "Do you want to change to the first class ticket?");

        JOptionPane.showMessageDialog(null,
                "You've chosen: " + (option == JOptionPane.YES_OPTION ? "Yes" : "No"));
        System.exit(0);
    }
}
```



Hình 10: Kết quả nếu người dùng chọn "No" hoặc "Cancel"

➔ Người dùng chọn “Cancel” thì JOptionPane.YES_OPTION trả về giá trị “No”.

- Để tùy chỉnh các lựa chọn, cần sử dụng phương thức *showOptionDialog()* thay vì phương thức *showConfirmDialog()*. Cụ thể mã nguồn như sau:

```java
// Exercise 6.1
package choosing_option;
import javax.swing.JOptionPane;

public class ChoosingOption {
    public static void main(String[] args) {

        // Tập lựa chọn
        String[] options = {"I do", "I don't"};

//      int option = JOptionPane.showConfirmDialog(null,
//              "Do you want to change to the first class ticket?");
//
//      JOptionPane.showMessageDialog(null,
//              "You've chosen: " + (option == JOptionPane.YES_OPTION ? "Yes" : "No"));
        int option = JOptionPane.showOptionDialog(null,
                "Do you want to change to the first class ticket?",
                "Custom Confirm Dialog Example",
                JOptionPane.YES_NO_OPTION,
                JOptionPane.QUESTION_MESSAGE,
                null,
                options,
                options[0]);

//      JOptionPane.showMessageDialog(null,
//              "You've chosen: " + (option == JOptionPane.YES_OPTION ? "Yes" : "No"));
        JOptionPane.showMessageDialog(null,
                "You've chosen: " + options[option]);

        System.exit(0);
    }
}
```

Hình 11: Mã nguồn chương trình ChoosingOption với tùy chỉnh lựa chọn

6.2. Write a program for input/output from project

```java
// Exercise 6.2
package choosing_option;
import java.util.Scanner;

public class InputFromKeyboard {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        String strName = keyboard.nextLine();
        System.out.println("How old are you?");
        int iAge = keyboard.nextInt();
        System.out.println("How tall are you (m)?");
        double dHeight = keyboard.nextDouble();

        System.out.println(
                "Mrs/Ms. " + strName + ", " + iAge + " years old. " + "Your height is " + dHeight + ".");

        keyboard.close();
    }
}
```

Hình 12: Mã nguồn chương trình InputFromKeyboard.java

Kết quả

InputFromKeyboard.java

```java
// Exercise 6.2
package choosing_option;
import java.util.Scanner;

public class InputFromKeyboard {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
        String strName = keyboard.nextLine();
        System.out.println("How old are you?");
        int iAge = keyboard.nextInt();
        System.out.println("How tall are you (m)?");
        double dHeight = keyboard.nextDouble();

        System.out.println(
                "Mrs/Ms. " + strName + ", " + iAge + " years old. " + "Your height is " + dHeight + ".");

        keyboard.close();
    }
}
```

Problems Javadoc Declaration Console Terminal

```
<terminated> InputFromKeyboard [Java Application] C:\Users\Hung\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_23.0.0.v202
Nguyen Dang Phuc Hung
How old are you?
20
How tall are you (m)?
1.80
Mrs/Ms. Nguyen Dang Phuc Hung, 20 years old. Your height is 1.8.
```

6.3. Write a program to display a triangle with a height of n stars (*), n is entered by user.

```java
// Exercise 6.3
package display_star;
import java.util.Scanner;

public class DisplayStar {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);

        // Khoi tao bien n: chieu cao cua tam giac
        int n_hungndp = -1;
        while (n_hungndp <= 0) {
            System.out.print("Input n (n > 0, if not you must reinput until n > 0)\n n = ");
            n_hungndp = keyboard.nextInt();
        }

        keyboard.close();

        int space = n_hungndp - 1;

        for (int i = 1; i <= n_hungndp; i++) {

            // Dich đi n-1 khoảng trắng
            for (int j = 0; j < space; j++) {
                System.out.print(" ");
            }

            // Điền 2n-1 dấu *
            for (int k = 0; k < 2 * i - 1; k++) {
                System.out.print("*");
            }

            System.out.print("\n");
            space--;
        }
    }
}
```

Hình 13: Mã nguồn chương trình DisplayStar.java

Kết quả

```java
// Exercise 6.3
package display_star;
import java.util.Scanner;

public class DisplayStar {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);

        // Khoi tao bien n: chieu cao cua tam giac
        int n_hungndp = -1;
        while (n_hungndp <= 0) {
            System.out.print("Input n (n > 0, if not you must reinput until n > 0)\n n = ");
            n_hungndp = keyboard.nextInt();
        }

        keyboard.close();

        int space = n_hungndp - 1;

        for (int i = 1; i <= n_hungndp; i++) {

            // Dich đi n-1 khoảng trắng
            for (int j = 0; j < space; j++) {
                System.out.print(" ");
            }

            // Điền 2n-1 dấu *
            for (int k = 0; k < 2 * i - 1; k++) {
                System.out.print("*");
            }

            System.out.print("\n");
            space--;
        }
    }
}

```

Problems Javadoc Declaration Console Terminal

```
<terminated> DisplayStar (1) [Java Application] C:\Users\Hung\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_2
Input n (n > 0, if not you must reinput until n > 0)
 n = 0
Input n (n > 0, if not you must reinput until n > 0)
 n = 4
   *
  ***
 *****
*******
```

6.4. Write a program to display the number of days of a month, month and year are entered by user. If the month/year is invalid, ask the user to enter again.

```java
// Exercise 6.4
package calc_day;
import java.util.Scanner;

public class CalcDay {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);

        // Khởi tạo các đầu vào hợp lệ cho tháng
        String[][] months = {
                {"January", "Jan", "Jan.", "1"},
                {"February", "Feb", "Feb.", "2"},
                {"March", "Mar", "Mar.", "3"},
                {"April", "Apr", "Apr.", "4"},
                {"May", "May", "May", "5"},
                {"June", "June", "Jun", "6"},
                {"July", "July", "Jul", "7"},
                {"August", "Aug", "Aug.", "8"},
                {"September", "Sep", "Sep.", "9"},
                {"October", "Oct", "Oct.", "10"},
                {"November", "Nov", "Nov.", "11"},
                {"December", "Dec", "Dec.", "12"}
        };

        // Nhập tháng
        System.out.print("Input month: ");
        String inputMonth = keyboard.nextLine();
        int month = 0;

        boolean monthIsValid = false;
        for (int i = 0; i < months.length; i++) {
            for (int j = 0; j < months[i].length; j++) {
                if (inputMonth.equals(months[i][j])) {
                    month = i + 1;
                    monthIsValid = true;
                    break;
                }
            }
        }

        // Xử lí nhập không hợp lệ
        while (monthIsValid == false) {
            System.out.print("Invalid input! Reinput month: ");
            inputMonth = keyboard.nextLine();

```

Hình 14: Mã nguồn chương trình CalcDay.java (1)

```
            monthIsValid = false;
            for (int i = 0; i < months.length; i++) {
                for (int j = 0; j < months[i].length; j++) {
                    if (inputMonth.equals(months[i][j])) {
                        month = i + 1;
                        monthIsValid = true;
                        break;
                    }
                }
            }
        }

        // Nhập năm
        System.out.print("Input year (must input the whole year, in non-negative number): ");
        int year_hungndp = keyboard.nextInt();

        // Xử lí nhập không hợp lệ (nhỏ hơn 0)
        while (year_hungndp < 0) {
            System.out.print("Invalid input! Reinput year: ");
            year_hungndp = keyboard.nextInt();
        }

        if (month == 1 || month == 3 || month == 5 || month == 7 || month == 8 || month == 10 || month == 12) {
            System.out.println(month + "/" + year_hungndp + " has 31 days.");

        } else if (month == 4 || month == 6 || month == 9 || month == 11) {
            System.out.println(month + "/" + year_hungndp + " has 30 days.");

        } else { // Xử lí tháng 2
            if (year_hungndp % 4 != 0) {
                System.out.println(month + "/" + year_hungndp + " has 28 days.");

            } else {
                if (year_hungndp % 100 == 0 && year_hungndp % 400 != 0) {
                    System.out.println(month + "/" + year_hungndp + " has 28 days.");

                } else {
                    System.out.println(month + "/" + year_hungndp + " has 29 days.");
                }
            }
        }

        keyboard.close();
    }
}
```

Hình 15: Mã nguồn chương trình CalcDay.java (2)

Kết quả

```
                {"August", "Aug", "Aug.", "8"},
                {"September", "Sep", "Sep.", "9"},
                {"October", "Oct", "Oct.", "10"},
                {"November", "Nov", "Nov.", "11"},
                {"December", "Dec", "Dec.", "12"}
        };

        // Nhập tháng
        System.out.print("Input month: ");
        String inputMonth = keyboard.nextLine();
        int month = 0;

        boolean monthIsValid = false;
        for (int i = 0; i < months.length; i++) {
            for (int j = 0; j < months[i].length; j++) {
                if (inputMonth.equals(months[i][j])) {
                    month = i + 1;
                    monthIsValid = true;
                    break;
                }
            }
        }

        // Xử lí nhập không hợp lệ
        while (monthIsValid == false) {
            System.out.print("Invalid input! Reinput month: ");
            inputMonth = keyboard.nextLine();

            monthIsValid = false;
            for (int i = 0; i < months.length; i++) {
                for (int j = 0; j < months[i].length; j++) {
                    if (inputMonth.equals(months[i][j])) {
                        month = i + 1;
```

Problems Javadoc Declaration Console Terminal

```
<terminated> CalcDay [Java Application] C:\Users\Hung\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full
Input month: xyz
Invalid input! Reinput month: Jan
Input year (must input the whole year, in non-negative number): 2025
1/2025 has 31 days.
```

Hình 16: Kết quả thực hiện chương trình CalcDay (1)

```
18                  {"August", "Aug", "Aug.", "8"},
19                  {"September", "Sep", "Sep.", "9"},
20                  {"October", "Oct", "Oct.", "10"},
21                  {"November", "Nov", "Nov.", "11"},
22                  {"December", "Dec", "Dec.", "12"}
23          };
24
25          // Nhập tháng
26          System.out.print("Input month: ");
27          String inputMonth = keyboard.nextLine();
28          int month = 0;
29
30          boolean monthIsValid = false;
31          for (int i = 0; i < months.length; i++) {
32              for (int j = 0; j < months[i].length; j++) {
33                  if (inputMonth.equals(months[i][j])) {
34                      month = i + 1;
35                      monthIsValid = true;
36                      break;
37                  }
38              }
39          }
40
41          // Xử lí nhập không hợp lệ
42          while (monthIsValid == false) {
43              System.out.print("Invalid input! Reinput month: ");
44              inputMonth = keyboard.nextLine();
45
46              monthIsValid = false;
47              for (int i = 0; i < months.length; i++) {
48                  for (int j = 0; j < months[i].length; j++) {
49                      if (inputMonth.equals(months[i][j])) {
50                          month = i + 1;
```

Problems Javadoc Declaration Console Terminal

```
<terminated> CalcDay [Java Application] C:\Users\Hung\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32
Input month: 2
Input year (must input the whole year, in non-negative number): 2020
2/2020 has 29 days.
```

Hình 17: Kết quả thực hiện chương trình CalcDay (2)

6.5. Write a Java program to sort a numeric array, and calculate the sum and the average value of array elements.

```java
// Exercise 6.5
package array;
import java.util.Scanner;

public class Array {
    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);

        // Nhập số phần tử mảng
        System.out.print("Nhap so phan tu mang (> 0): ");
        int n = keyboard.nextInt();

        while (n <= 0) {
            System.out.print("Nhap loi! Moi nhap lai so phan tu cua mang: ");
            n = keyboard.nextInt();
        }

        // Khởi tạo mảng
        Double[] myArray = new Double[n];

        // Nhập phần tử mảng
        for (int i_hungndp = 0; i_hungndp < n; i_hungndp++) {
            System.out.print("array[" + i_hungndp + "] = ");
            myArray[i_hungndp] = keyboard.nextDouble();
        }

        // Hiển thị mảng vừa nhập
        System.out.println("Mang vua duoc nhap:");
        for (int i = 0; i < n; i++) {
            System.out.print(myArray[i] + "\t");
        }
        System.out.print("\n");

        // Sắp xếp mảng theo thứ tự tăng dần
        for (int i = 0; i < n - 1; i++) {
            for (int j = i + 1; j < n; j++) {
                if (myArray[i] > myArray[j]) {
                    Double temp_hungndp = myArray[i];
                    myArray[i] = myArray[j];
                    myArray[j] = temp_hungndp;
                }
            }
        }

        // Hiển thị mảng đã sắp xếp
        System.out.println("Mang vua sap xep:");
        for (int i = 0; i < n; i++) {
            System.out.print(myArray[i] + "\t");
        }
        System.out.print("\n");

        // Tính tổng và trung bình
        Double sum = 0.0, avg = 0.0;

        for (int i = 0; i < n; i++) {
            sum += myArray[i];
        }
        avg = sum / n;

        System.out.println("sum = " + sum);
        System.out.print("avg = " + avg);

        keyboard.close();
    }
}
```

Hình 18: Mã nguồn chương trình Array.java

Kết quả

```
52          // Tính tổng và trung bình
53          Double sum = 0.0, avg = 0.0;
54
55          for (int i = 0; i < n; i++) {
56              sum += myArray[i];
57          }
58          avg = sum / n;
59
60          System.out.println("sum = " + sum);
```

Problems Javadoc Declaration Console Terminal

```
<terminated> Array [Java Application] C:\Users\Hung\.p2\pool\plugins\org.ecli
Nhap so phan tu mang (> 0): 0
Nhap loi! Moi nhap lai so phan tu cua mang: 4
array[0] = 1021
array[1] = 32
array[2] = 9
array[3] = 1
Mang vua duoc nhap:
1021.0  32.0    9.0     1.0
Mang vua sap xep:
1.0     9.0     32.0    1021.0
sum = 1063.0
avg = 265.75
```

6.6. Write a Java program to add two matrices of the same size.

```java
// Exercise 6.6
package add_matrices;
import java.util.Scanner;

public class AddMatrices {

    public static void main(String[] args) {
        Scanner keyboard_hungndp = new Scanner(System.in);

        // Nhập kích thước ma trận
        System.out.print("Nhap kich thuoc ma tran MxN, cach nhau boi dau cach (m, n > 0): ");
        int m = keyboard_hungndp.nextInt();
        int n = keyboard_hungndp.nextInt();

        while (m * n <= 0) {
            System.out.print("Nhap loi! Moi nhap lai: ");
            m = keyboard_hungndp.nextInt();
            n = keyboard_hungndp.nextInt();
        }

        // Khởi tạo 2 ma trận
        Double[][] mat1 = new Double[m][n];
        Double[][] mat2 = new Double[m][n];

        // Nhập ma trận thứ nhất
        System.out.println("Nhap ma tran dau tien (moi dong la 1 hang, moi phan tu cach nhau boi dau cach):");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                mat1[i][j] = keyboard_hungndp.nextDouble();
            }
        }

        // Nhập ma trận thứ hai
        System.out.println("Nhap ma tran thu hai (moi dong la 1 hang, moi phan tu cach nhau boi dau cach):");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                mat2[i][j] = keyboard_hungndp.nextDouble();
            }
        }

        // Tính tổng 2 ma trận
        Double[][] result = new Double[m][n];
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                result[i][j] = mat1[i][j] + mat2[i][j];
            }
        }

        // Hiển thị kết quả
        System.out.println("Ket qua la:");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                System.out.print(result[i][j] + "\t");
            }
            System.out.print("\n");
        }

        keyboard_hungndp.close();
    }
}
```

Hình 19: Mã nguồn chương trình AddMatrices.java

Kết quả

```
Nhap kich thuoc ma tran MxN, cach nhau boi dau cach (m, n > 0): 0 1
Nhap loi! Moi nhap lai: 2 3
Nhap ma tran dau tien (moi dong la 1 hang, moi phan tu cach nhau boi dau cach):
12 34 50
10 23 1
Nhap ma tran thu hai (moi dong la 1 hang, moi phan tu cach nhau boi dau cach):
20 12 3
2 3 6
Ket qua la:
32.0    46.0    53.0
12.0    26.0    7.0
```