

LAB 2 - Extra

The objective of this lab is to explain how java does basic input and to introduce the class Scanner. Scanner is used if you want to get the values of variables from the user.

In order to do that, you must include the import directive to import the class Scanner, add the line `import java.util.Scanner;` at the top of your class.

Inside the program, you must define an object of class Scanner and use it to stream input from the keyboard. For example, here we define the variable `input` as our Scanner object.

```
Scanner input = new Scanner(System.in);
```

To read an int variable x, we write : `x = input.nextInt();`

To read a double variable y, we write: `y = input.nextDouble();`

To read a String s, we write: `s = input.next();`

To read a String s to the end of the line, we write: `s = input.nextLine();`

ملاحظات:

1. إختيار إسم المتغيرك input ليس مقيدا.. ممكن تختار أي إسم.
2. للقراءة من لوحة المفاتيح تحتاج متغير واحد فقط من نوع سكانر لكل البرنامج.
3. عند طلب إدخال قيمة من المستخدم فإن البرنامج سيتوقف عن التنفيذ بإنتظار إدخال تلك القيمة.

Q1) Write a Java Program that will read two integers x and y and print the following:

1- $x+y$

2- $x-y$

3- $x*y$

Create a project **Lab02**

Name your class **TwoNumbers**

Sample Run:

Please Enter X and Y: 2 7 ↵

X+Y = 9

X-Y = -5

X*Y = 14

Q2) Write a Java program that will read the radius r of a circle and then compute and print the area of that circle using the formula $Area=\pi*r^2$.

Where π is a constant 3.14159265359....

Name your class **Circle**

Hint:

You can use **Math.PI** to represent pi.

Sample Run:

Please enter the radius of the circle: 4.5 ↵

The area of the circle is = 63.617197499999996

Q3) Write a Java program that will read the first and last name of a Student, his GPA (double) and his age in one line. And then print them Each on one line exactly as shown in the sample run.

Name your class **Info**.

Hint: Declare two Strings, one for first name and one for last name.

Sample Run:

Enter name, GPA and age: Fahad Hamad 4.2 20 ↵

The Student name is: Fahad Hamad

His GPA is: 4.2

His Age is: 20

Q4) Write a Java program that will read two double numbers x and y, and compute and print x to the power y.

Name your class **XpowerY**

Hint: Use **Math.pow**(Base,Power) to compute x to the power y.

Example: `Math.pow(3,4)` is 3 to the power 4 = 81

Sample Run:

Please Enter X and Y: 3 7 ↵

The result of raising 3.0 to the power 7.0 is 2187.0

Q5) Write a Java Program that will read two double variables x and y and print the following:

1- $|x-y|$ القيمة المطلقة

2- $\sqrt{(x * x) + 2}$

Name your class **XandY**

Hint: Use **Math.pow(Base,Power)** to compute the square root.

For example:

$x^2 = \text{Math.pow}(x,2)$.

$\sqrt{z-3} = (z-3)^{1/2} = \text{Math.pow}(z-3), 0.5)$

Use **Math.abs(number)** to compute absolute value.

For example:

$|x-y| = \text{Math.abs}(x-y)$

Sample Run:

Please Enter X and Y: **-6 2** ↵

$|x-y| = 8.0$

$\text{SQRT}((x*x)+2) = 6.164414002968976$

Solutions:

Q1:

```
import java.util.Scanner;
public class TwoNumbers {
public static void main(String args[]) {
// Read x and y
Scanner input = new Scanner(System.in );
System.out.print("Please Enter X and Y: ");
int x = input.nextInt();
int y = input.nextInt();

System.out.println("x+y = " + (x+y));
// Complete the solution قم بإكمال الحل

}
}
```

Q2:

```
import java.util.Scanner;
public class Circle {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        System.out.print("Please enter raduis of the circle: ");
        double r = kb.nextDouble();
        double area = Math.PI * r * r;
        System.out.println("The area of the circle is = "+area);
        kb.close();
    }
}
```

Q3:

```
import java.util.Scanner;
public class Info {
public static void main(String args[]) {
Scanner kb = new Scanner(System.in );
String n1, n2;
double GPA;
int age;
// First we read the data
System.out.print("Enter name, GPA and age: ");
n1 = kb.next();
n2 = kb.next();
GPA = kb.nextDouble();
Age = kb.nextInt();
// Now we print the output
System.out.print("The Student name is: "+n1+" "+n2);
System.out.print("His GPA is: "+GPA);
System.out.print("His Age is: "+age);
    }
}
```

Q4:

```
import java.util.Scanner;
public class Power {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        System.out.print("Please enter two numbers ");
        double x = kb.nextDouble(), y=kb.nextDouble();
        System.out.println("The result of raising "+x+" to the power"
+y+" is "+ Math.pow(x,y));
        kb.close();
    }
}
```

Q5:

```
import java.util.Scanner;
public class XandY {
public static void main(String args[]) {
Scanner kb = new Scanner(System.in );
System.out.print("Please Enter X and Y:");
// Read x and y
double x = kb.nextDouble();
double y = kb.nextDouble();

System.out.println("|x| = " + Math.abs(x));
// Complete the solution قم بإكمال الحل

}
}
```