

King Saud University
College of Computer & Information Science
CSC111 – Tutorial02
IO, Variables, Expressions
All Sections

Objectives:

- 1- Student should learn how to define variable, assign them values and write arithmetic expressions.
- 2- Student should learn how to use class Scanner to read inputs.
- 3- Student should learn how to output results using `System.out.print(ln)`.
- 4- Student should learn how to read a problem statement and analyze it as following:
 - a. Find out if program needs input, how many inputs it is going to accept and of what type.
 - b. Decide if variables are needed, how many variable and of what type.
 - c. Understand the computation operations that are needed to solve the problem (i.e., if program needs to compute certain values using arithmetic expression).
 - d. Decide what is the program is going to output to the end user.

Exercise 1

- a) Write a statement that defines a variable **length** of type **double** and reads its value from the input using a predefined **Scanner** object named **input**.

b) Which of the following identifiers are valid? Which are Java keywords?

miles, Test, a++, --a, 4#R, \$4, #44, apps
class, public, int, x, y, radius

c) Identify and fix the errors in the following code:

```
public class Test {  
  
    public void main(String args) {  
        int i = j = 2;  
        System.out.println(i + " " ++ j);  
    }  
}
```

Solution

a) **double** length = input.nextDouble();

b) Valid: miles, Test, \$4, apps, radius, x, y,

Keywords: class, public, int,

c) Here are the errors:

```
public class Test {  
    public void main(String args) {  
        int i = j = 2;  
        System.out.println(i + " " ++ j);  
    }  
}
```

Missing static (arrow to public)

Missing (arrow to closing brace of main)

Variable j is not defined (arrow to j in int i = j = 2;)

A closing brace } is missing (arrow to closing brace of class)

We need only one + (arrow to ++ in ++ j)

Here is the program after correcting the errors:

```
public class Test {  
  
    public static void main(String[] args) {  
        int j;  
        int i = j = 2;  
        System.out.println(i + " " + j);  
    }  
}
```

Exercise 2

What is the output of the following program?

```
public class FindMyOutput {  
    public static void main(String args[]) {  
        int j, k, L;  
        j = 30;  
        k = 10;  
        k = k - 5;  
        L = k / 5;  
  
        System.out.println(" j = " + j);  
        System.out.print(" k = " + k + ", ");  
        System.out.print(" L = " + L);  
    }  
}
```

Solution

<pre>j = 30 k = 5, L = 1</pre>

Exercise 3

Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters. Write a program that prompts the user to enter a weight in kilograms and height in meters and displays the BMI.

Here is a sample run:

```
Enter weight in kilograms: 70 ↵
Enter height in meters: 1.7 ↵
BMI is 24.221453287197235
```

Solution

Here are the steps in developing the solution program to this problem:

1. First try to understand the problem by manually finding your BMI.
Use your height and weight to calculate your BMI
2. Find what is the input to the program. The program should take two inputs: weight and height.
3. The program has to store the inputs into variables. So you need to define two variables weight and height.
4. The computation that your program will carry out is:

$$bmi = \frac{weight}{height^2}$$

You need to write the equivalent expression in java.

5. The value that is computed by the expression above has to be stored somewhere. This means that you have to define a variable named bmi to store the computed value in it.

6. Find what the program is supposed to output. The program is supposed to print the BMI of a person.

```
import java.util.Scanner;

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

        // Prompt the user to enter weight in kilograms
        System.out.print("Enter weight in kilograms: ");
        double weight = input.nextDouble();

        // Prompt the user to enter height in meters
        System.out.print("Enter height in meters: ");
        double height = input.nextDouble();

        double bmi = weight / (height * height);

        System.out.print("BMI is " + bmi);
    }
}
```

Done...