Java Variables – Part 3

Scanner's methods, **next()** and **nextLine()**, are used to acquire input as a String type. The following examples show you how to receive input as both an integer and a real number.

To create an integer and a real number variable, the following two types are used.

1. Type **int** is used for an integer.
   For example:
   int x = 1;

2. Type **double** is used for any real number.
   For example:
   double x = 1;
   double y = 1.0;
   double z = 1.234;

Acquiring input as an integer

The following example acquires two integers and performs addition of the two integers.

1. Scanner provides a method, nextInt(), to acquire an input from the user as an integer.

```
4       Scanner input = new Scanner(System.in);
5       int x = 0;
6       System.out.print("Enter x:");
7       x = input.nextInt();
```

   - Line 5: **Declare (int x)** and **initialize (= 0)** an integer x to 0;
   - Line 6: **Prompt** the user to enter an integer value for variable x.
   - Line 7: **Acquire** an input and **store** it in the variable x
   - Notice that **on line 7, x** is used **without the type int** in front of it unlike the one appeared on line 5. A variable can only be **declared once in a program**. When using it again in the same program, its type must not be included.

2. Acquire another integer and store it in another variable.

```
8       System.out.print("Enter y:");
9       int y = input.nextInt();
```

   - Line 9: **Declare variable y** and **initialize it** with Scanner's nextInt() method unlike when creating the x variable above.
   - Either approach of declaring appeared on line 5 for variable x or line 9 for variable y is absolutely valid.

3. Perform a mathematic operation by adding the two integers received from the user and display the result.

```
10      int sum = x + y;
11      System.out.println("sum = " + sum);
12      System.out.println(x + "+" + y + "=" + sum);
```

- Line 10: **Declare an int** variable named **sum** to store **the result of addition**.
- Line 11 and 12: Examples of displaying the result of addition in different formats.

4. Here is a sample run of the codes from line 4 to 12.

```
> run NumberExample
Enter x: 10
Enter y: 5
sum = 15
10+5=15
```

The following example acquires two real numbers and performs division of the two numbers.

1. Scanner provides a method, nextDouble(), to acquire an input from the user as a real number.

```
14      System.out.print("Enter numerator:");
15      double n = input.nextDouble();
16      System.out.print("Enter denominator:");
17      double d = input.nextDouble();
```

- Line 14: **Prompt** the user to enter any number value for variable n as a numerator.
- Line 15: **Declare (double n)** and **initialize it** with Scanner's nextDouble() method.
- Line 16: **Prompt** the user to enter any number value for variable d as a denominator.
- Line 7: **Declare (double d)** and **initialize it** with Scanner's nextDouble() method.

2. Perform a mathematic operation by dividing the two numbers received from the user and display the result.

```
19      double div = n / d;
20      System.out.println(n + "/" + d + "=" + div);
21      System.out.printf("%f / %f = %.2f", n, d, div);
```

- Line 19: **Declare a double** variable named **div** to store **the result of division**.
- Line 20 and 21: Examples of displaying the result of addition in different formats.

3. Here is a sample run of the codes from line 14 to 21.

```
Enter numerator: 100
Enter denominator: 3
100.0/3.0=33.333333333333336
100.000000 / 3.000000 = 33.33
```

NumberExample.java full codes

NumberExample.java

```
1  import java.util.Scanner;
2  public class NumberExample {
3    public static void main(String [] args) {
4      Scanner input = new Scanner(System.in);
5      int x = 0;
6      System.out.print("Enter x:");
7      x = input.nextInt();
8      System.out.print("Enter y:");
9      int y = input.nextInt();
10     int sum = x + y;
11     System.out.println("sum = " + sum);
12     System.out.println(x + "+" + y + "=" + sum);
13
14     System.out.print("Enter numerator:");
15     double n = input.nextDouble();
16     System.out.print("Enter denominator:");
17     double d = input.nextDouble();
18
19     double div = n / d;
20     System.out.println(n + "/" + d + "=" + div);
21     System.out.printf("%f / %f = %.2f", n, d, div);
22   }
23 }
```

Symbols of mathematic operations in Java Statement

+ Addition
- Subtraction
* Multiplication
/ Division