**King Saud University**

**College of Computer & Information Science**

**CSC111 – Tutorial03**

**IO, Variables, Expressions**

**All Sections**

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# 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:
   1. Find out if program needs input, how many inputs it is going to accept and of what type.
   2. Decide if variables are needed, how many variable and of what type.
   3. Understand the computation operations that are needed to solve the problem (i.e., if program needs to compute certain values using arithmetic expression).
   4. Decide what is the program is going to output to the end user.
5. Student should learn how to write expressions and use operators according to precedence rules.

# Exercise 1

1. 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**.
2. 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**

# Identify and fix the errors in the following code:

**public** **class** Test {

**public** **static** **void** main(String[] args) {

**int** i = j = k = 2;

System.***out***.println(i + " " + j + " " + k);

}

}

1. Convert the following expression into a Java expression:

# Solution

1. **double** length = input.nextDouble();
2. Valid: **miles, Test, $4, apps, radius, x, y,**

Keywords: **class, public, int,**



**public** **class** Test {

**public** **static** **void** main(String[] args) {

**int** i = 2, j = 2, k = 2;

System.***out***.println(i + " " + j + " " + k);

}

}

1. (x + 3 \* (y + 1)) / (z + x \* y)

# Exercise 2

Write a program that changes a given amount of money into smaller monetary units. The program lets the user enter an amount as a **double** value representing a total in Riyals and Halals, and outputs a report listing the monetary equivalent in the maximum number of riyals, halfs (SR 0.5), quarters (SR 0.25), qirsh (SR 0.5), and halalah (SR 0.01), in this order, to result in the minimum number of coins.

Here is a sample run:

Enter an amount, for example, 11.88: 11.88 **↵**

Your amount 11.56 consists of

11 riyals

1 halfs

1 quarters

2 qirshs

3 halalahs

# Solution

Here are the steps in developing the program:

1. Prompt the user to enter the amount as a decimal number, such as **11.88**.
2. Convert the amount (e.g., **11.88**) into halalas (**1188**).
3. Divide the halalas by **100** to find the number of riyals. Obtain the remaining halalas using the halalas remainder **100**.
4. Divide the remaining halalas by **50** to find the number of halfs. Obtain the remaining halalas using the remaining halalas remainder **50**.
5. Divide the remaining halalas by **25** to find the number of quarters. Obtain the remaining halalas using the remaining halalas remainder **25**.
6. Divide the remaining halalas by **5** to find the number of qirshs. Obtain the remaining halalas using the remaining halalas remainder **5**.
7. The remaining halalas are the halalas (can not be divided).
8. Display the result.

**import** java.util.Scanner;

**public** **class** ComputeChange {

**public** **static** **void** main(String[] args) {

// Create a Scanner

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

// Receive the amount

System.***out***.print("Enter an amount in double, for example 11.88: ");

**double** amount = input.nextDouble();

**int** remainingAmount = (**int**) (amount \* 100);

// Find the number of one riyals

**int** numberOfOneRiyals = remainingAmount / 100;

remainingAmount = remainingAmount % 100;

// Find the number of halfs in the remaining amount

**int** numberOfHalfs = remainingAmount / 50;

remainingAmount = remainingAmount % 50;

// Find the number of quarters in the remaining amount

**int** numberOfQuarters = remainingAmount / 25;

remainingAmount = remainingAmount % 25;

// Find the number of qirshs in the remaining amount

**int** numberOfQirshs = remainingAmount / 5;

remainingAmount = remainingAmount % 5;

// Find the number of halalas in the remaining amount

**int** numberOfHalalas = remainingAmount;

// Display results

System.***out***.println("Your amount " + amount + " consists of");

System.***out***.println(" " + numberOfOneRiyals + " riyals");

System.***out***.println(" " + numberOfHalfs + " halfs ");

System.***out***.println(" " + numberOfQuarters + " quarters");

System.***out***.println(" " + numberOfQirshs + " qirshs");

System.***out***.println(" " + numberOfHalalas + " halalas");

}

}

**Done…**