New York University
Computer Science Department
Introduction to Software Development
Dr. Anasse Bari
Homework#2: Expressions, assignment statements and arithmetic operators in Java
 Deadline: *See NYUclasses for the deadline, 15% off per day after the deadline (3 days maximum).*

Learning Objectives:

- Understanding Java expressions and assignment statements
- Learning how to work with variables in Java
- Learning the process of going from simple algorithms to implementation
- Practicing selection statements and Java's Math Library
- Learning how to research for appropriate Java classes and use them properly.
- Learning random number generators in Java

Read the guidelines bellow carefully to avoid receiving a zero grade on the HW:

- Please use the following naming convention "ExerciseX.java", where X is the number of the exercise. Please apply this convention to all future homework assignments during the semester.
- Compile and run the program for each exercises.
- Make an archive (zip file or compressed file) with all the **java files (the .java files NOT the .class files)** and post it on NYU Classes (StudentName_Homework_X.zip)
- It is your responsibility to make sure that the Zip files has your actual files. You may send the file to yourself by email to double check before you upload on NYU classes.
- **If the graders cannot open the file, you will receive a grade of zero.**
- **If you send the .class files instead of the .java files (source files) you will receive a zero.**
- Please **do not send the entire project**, the Java file for each exercise is all that we need.
- Cheating will be severely addressed with an immediate zero on the homework and a report to the academic advisor and the administration.
- You will automatically lose 50%of the points for an exercise if the program does not compile and run correctly.

Exercise 1 (10pts):

Write a program that calculates the addition, subtraction, division, multiplication, and the remainder of two numbers (Integers) being entered by the user.

Data Requirements

Problem input

X   /* first number */

Y   /*second number */

Problem output

Sum of x and y

Subtraction of x and y

Division of x and y

Multiplication of x and y

Reminder of x and y

Exercise 2 (10pts):

Write a program that converts Kilometers to Miles

Problem input

/* Number of m kilometers */

Problem output

/* Number of miles */

Relevant Formula

1Km = 0.6214 miles

Exercise 3 (10pts):

Write a program that predicts the score needed on a final exam to achieve a desired grade in a course. The program should interact with the user as follows:

Enter desired grade> B

Enter minimum average required> 79.5

Enter current average in course> 74.6

Enter how much the final count as a percentage of the course grade> 25

You need a score of 94.2 on the final to get **B**

Relevant Formula

Score needed = (minimum average required - (current average * (1- final percentage decimal)) / final percentage decimal

Exercise 4 (10pts):

Write a program that converts temperature in Fahrenheit to Celsius
Problem input
/* Number of degrees in Fahrenheit */
Problem output
/* Number of degrees in Celsius */
C = (5/9) * (*F*-32)

Exercise 5 (10pts):

Write a computer program that asks the user for a password and checks if the password is correct. If the password is valid, you display a message to the user saying "Valid Password". Otherwise, you display the message "Invalid Password".

Assume that the valid password is "NYU1256"

Note: You will need to research how to use Strings in Javas and find the right method to compare two Strings. You will also need to use a selection statement.

Exercise 6 (10pts):

Write a Java program that computes the maximum of two given numbers using Java.Lang.Math

You need to read the numbers from the console and display the maximum to the console.

Exercise 7 (10pts):

Write a Java program that computes the arithmetic mean of your grades for the first three exams. The grading scale is 1-10. Use 2 decimals for mean value.
Input: Output:
8 8 9   8.33

The input has to be in the format as shown above.

Exercise 8 (10pts):

Write Java program to generate a *random number* between 1 to 10.

Exercise 9 (10pts):

Write a Java program to declare two integer variables, one float variable, and one string variable and assign 20,3,14.6, and "Hello 101 " to them respectively. Then display their values on the screen.

Exercise 10 (10pts):

Define the following concepts in your own words:

1. Java Virtual Machine (1pts)
2. Compilation Process (2pts)
3. CPU is one of the main components of computer hardware, briefly define a CPU (1pts)
4. What is a variable in Java? Provide two example of two variable declaration and initialization (2pts)
5. What is a String in Java? Provide an example (1pts)
6. What is Scanner? (1pts)
7. What is a Java Library? Provide an example. (2pts)

For exercises 11 and 12, you will need to conduct your own research for the proper Java library that you will need to use to answer exercise 11 and 12. Please cite your sources as comments for those two exercises if you use external sources.

Exercise 11 (2.5pts): (BONUS) Write a Java program that gets your system IP address and display it on screen. Output (it's just an example, you may have a different output).
    IP of my system is: 192.168.8.116 7.

Exercise 12 (2.5pts): (BONUS) Write a Java program that gets you system time and date and display them on screen. Input:
    Output(it's just an example, you may have a different output):
    Sun Sep 15 15:12:40 2013