**HW3**

**Due Date: 24/11/2015, Midnight**

1. (Math: approximate the square root) There are several techniques for implementing the sqrt method in the Math class. On such technique is known as the Babylonian method. It approximates the square root of a number, **n**, by repeatedly performing a calculation using the following formula:

**nextGues** = (**lastGuess** + **n** / **lastGuess**) / 2

When **nextGuess** and **lastGuess** are almost identical, **nextGuess** is the approximated square root. The initial guess can be any positive value (e.g., 1). This value will be the starting value for **lastGuess**. If the difference between **nextGuess** and **lastGuess** is less than a very small number, such as 0.0001, you can claim that **nextGuess** is the approximated square root of **n**. If not, **nextGuess** becomes **lastGuess** and the approximation process continues. Implement the following method that returns the square root of **n**.

public static double sqrt(long n)

1. Write a program that requests a pattern string from the user. The pattern includes wild card character “\*” in addition to any other characters. Each occurrence of the wild chard character represents a sequence of any characters. After getting the pattern, the program continuously requests the user to enter a string and checks if the pattern occurs in the string using a method **public static boolean occursIn(String pattern, String str)**. The program will exit when the user enters “**exit**”.

Example outputs of the program would be as follows:

Enter the pattern string: s\*h\*l

Enter a string: school

s\*h\*l occurs in ”school”

Enter a string: okul

s\*h\*l does NOT occur in ”okul”

Enter a string: salaries are neither high nor low

s\*h\*l occurs in ”salaries are neither high nor low”

Enter a string: This is a good school, isn’t it?

s\*h\*l occurs in ”This is a good school, isn’t it?”

Enter a string: I love programming

s\*h\*l does NOT occur in ”I love programming”

Enter a string: exit

Bye

1. Write a program that checks the suffixes of two given words. Your program must make use of the **commonSuffix** method with the following header:

public static String commonSuffix (String s1, String s2)

For example, the common suffix of “caption” and “action” is “tion”. If the two strings have no common suffix, the method returns an empty string. In the run() method of your program, prompt the user to enter two strings and display their common suffix.