ISD Week 3 Lab

1. Write a program that prompts the user to enter a number representing a starting amount in an account, and a number between 0 and 100 representing the annual interest earned. The program should output the new balance after year 1, year 2 etc. The program should stop when the balance has exceeded double the initial amount.

2. Write a program that reads in twelve temperature values (representing the average temperatures for the months January 2011 to December 2011) and prints out the name of the month that had the highest temperature.

3. Write a program that first asks the user to input the exchange rate from UK pounds to Euros, and then asks the user to repeatedly enter an amount in UK pounds that they want to be converted to Euros. For each amount entered, the program should output the value in Euros. If the user enters an amount 0, then the program should end (so 0 is the "sentinel" value for the sequence of amounts input by the user).

4. Write a program that reads in a word and prints out each character of the word on a separate line. Hint: use a "for" loop and the charAt method.

5. Write a program that reads in a word and prints it out in reverse. Hint: use a "for" loop and the charAt method.

6. Write a program that prints out a multiplication table like this:

```
 1  2  3  4  5  6  7  8  9  10
 2  4  6  8 10 12 14 16 18  20
 3  6  9 12 15 18 21 24 27  30
 . . .
10 20 30 40 50 60 70 80 90 100
```

   Hint: use a nested "for" loop, with the outer loop iterating over the 10 rows, and the inner loop iterating over the 10 columns.

7. Write a program that reads in a word and prints out all its substrings, sorted by length. For example, if the user inputs the word "drum", then the program should print:

```
d
r
u
m
dr
ru
um
dru
rum
drum
```

Hint: Use a nested “for” loop, with the outer loop iterating over the length of the substrings (1,2,...) and the inner “for” loop printing out all the substrings of that length.

8. Write a program that prompts the user to enter a word, and that outputs the number of vowels in the word (i.e. the number of occurrences of A,E,I,O,U or a,e,i,o,u).

   For this program, write and use a ***method*** called countVowels that takes as an argument a string and returns the number of vowels in the string. So countVowels starts like this:

   ```
   public static int  countVowels(String str)
   ```

   Comment your method as shown in the lecture:

   Start with /**

   Briefly describe the purpose of the method

   Describe each parameter in a line starting with @param

   Describe the return value in a line starting with @return

   End with */

   In BlueJ, Click on Tools and select Project Documentation to generate the Javadoc for your program. Back in the editor, change the “Source Code” selection in the top right-hand corner to “Documentation” to see the documentation generated about your program and the method you’ve written and commented.

9. Write a program prompts the user to input: (i) a number representing an initial amount in an account, (ii) a number between 0 and 100 representing the annual interest rate, and (iii) a number representing how many years the initial amount will be invested for. The program should output the new balance after that number of years.

   For this program, write and use a ***method*** that takes as arguments an initial amount, a yearly interest rate, and a number of years; and returns the balance after that number of years. Comment your method, and generate Javadoc for your program.