Vanier College, Continuing Education
Programming in Java
Winter 2015, Assignment-5

Teacher: Shamima Mithun **Due Date: March 30, 2015**

Objectives

- User Defined Methods

Question 1:

Write a value-returning method, `isVowel`, that returns the value true if a given character is a vowel, and otherwise returns false. Also write a program to test your method.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
input#1
Enter a character: a
output: true
```

```
input#2
Enter a character: g
output: false
```

Question 2:

Write a Java program that prompts the user to input a sequence of characters and outputs the number of vowels (Use the method `isVowel` written in Question 1)

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter characters in a line: I love programming in Java.

Output: There are 9 vowel in the input line
```

Question 3:

Write a method, `reverseDigit`, that takes an integer as a parameter and returns the number with its digits reversed. For example, the value of `reverseDigit`(12345) is 54321. Also write a program to test your method.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Input#1

Enter an integer: 637387

637387 with digits reversed = 783736 leading zeros if any are not
shown


input#2

Enter an integer: 5360

5360 with digits reversed = 635 leading zeros if any are not shown.
```

Question 4:

A nonnegative integer is called a **palindrome** if it reads forward and backward in the same way.

For example, the numbers 5, 121, 3443, and 123454321 are palindromes. Write a method that takes as input a nonnegative integer and returns true if the number is a palindrome; otherwise, it returns false. (When determining whether the umber is a palindrome, do not convert the number into a string.) Also write a program to test your method.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter an integer: 34543

34543 is a palindrome number.
```

Question 5:

The formula for converting a temperature from Fahrenheit to Celsius is

$$C= 5/9 (F - 32)$$

where F is the Fahrenheit temperature and C is the Celsius temperature. Write a method named *celsius* that accepts a Fahrenheit temperature as an argument. The method should return the temperature, converted to Celsius. Demonstrate the method by calling it in a loop that displays a table of the Fahrenheit temperatures 0 through 10 and their Celsius equivalents.

Sample runs of your program should generate the following outputs:

```
Fahrenheit Celsius
====================
1          -17.22
2          -16.67
3          -16.11
4          -15.56
5          -15.00
6          -14.44
7          -13.89
8          -13.33
9          -12.78
10         -12.22
```

Question 6:

Write a Java program that asks the user to enter a distance in meters. The program will then present the following menu of selections:

1. Convert to kilometers
2. Convert to inches
3. Convert to feet
4. Quit the program

The program will convert the distance to kilometers, inches, or feet, depending on the user's selection. Here are the specific requirements:

- Write a void method named `showKilometers`, which accepts the number of meters as an argument. The method should display the argument converted to kilometers. Convert the meters to kolometers using the following formula:
  `kilometers = meters * 0.001`
- Write a void method `showInches,` which accepts the number of meters as an argument. The method should display the argument converted to inches. Convert the meters to inches using the following formula:
  `inches = meters * 39.37`
- Write a void method `showFeet,` which accepts the number of meters as an argument. The method should display the argument converted to feet. Convert the meters to feet using the following formula:
  `feet = meters * 3.281`
- Write a void method named `menu` that displays the menu of selections. This method should not accept any argument.
- The program should continue to display the menu until the user enters 4 to quit the program.
- The program should not accept negative numbers for the distance in meters.
- If the user selects an invalid choice from the menu, the program should displays an error message.

Sample runs of your program should generate the following outputs (user input is shown in blue text):

```
Enter a distance in meters: 34
1. Convert to kilometers
2. Convert to inches
3. Convert to feet
4. Quit the program

Enter your choice: 2
34.0 meters is 1338.58 inches.

1. Convert to kilometers
2. Convert to inches
3. Convert to feet
4. Quit the program

Enter your choice: 1
34.0 meters is 0.034 kilometers.

1. Convert to kilometers
2. Convert to inches
3. Convert to feet
4. Quit the program

Enter your choice: 6
Invalid selection. Enter your choice: 4
Bye!
```

Question 7:

Write a method that rolls a pair of dice until the sum of the numbers rolled is a specified number (pass this number as a parameter). You also need to output the number of times the dice are rolled to get the desired sum.

Sample runs of your program should generate the following outputs

sample#1

The number of times the dice are rolled to get the sum: 10

output: 91

sample#2

The number of times the dice are rolled to get the sum: 6

output: 7

-End-