CIT 130 Beginning Java
**Assignment #7** – Total Points = 100

Assigned Date: 10/1 Date Due: 10/11

**DO NOT share your answers with anyone. DO NOT collaborate on completing work with anyone. DO NOT use the Internet to search for solution to assignments. DO NOT pay anyone to write your code. Failure to meet this requirement leads to a violation of the academic integrity principles.**

**Helper File**: See the helper files located under the assignment link where you picked up this assignment file for a sample question and answer.

**Grading Criteria File**: See the grading criteria file under the assignment link where you picked up this assignment file for a sample question and answer.

**Objective**: Demonstrate your understanding of Java **methods.** This assignment is based on the material covered in **chapter 6** of your textbook.

**Assignment**: Write a Java program to display a menu of 4 options, one for calling each of the methods you will define, below. Option 1 calls method 2, option 2 calls method 3, option 3 calls method 4, and option 4 ends the program. The program must run in a continuous loop until the user wishes to quit. Choose descriptive method names. Avoid using method names such as method1, method2, etc.

**Process**:
NOTE: results of calling individual methods are displayed in the main method.

a) Method 1: A **void** method to display a menu of choices.
b) Method 2: An **int** method to return the factorial of its integer parameter. If the method's parameter value is larger than 10, return -1. This method does display any output. It just returns a value.
c) Method 3: An **int** method that returns the number of occurrences of a given character in a string using the following header: **public static int count(String str, char c).** This method does display any output. It just returns a value.
d) Method 4: A **double** method to calculate future value of investment using compound interest. This method accepts what it needs as parameters and will return the future value. Use the header: **public static double getFutureValue(double principal, double rate, int times, int years**). This method does display any output. It just returns a value.

**Details:**

Method 2: The factorial of a number is the product of the numbers between 1 and the number. For example, factorial of 5 is 1 * 2 * 3 * 4 * 5 = 120. If the factorial of the number cannot be computed, issue a message such as "factorial of your number cannot be calculated". You will use the returned value (-1 for invalid value) of the method to issue the error message.

Method 3: Use a simple loop and a decision statement to count the number of characters in the string.
Method 4: If you deposit money in an account and let the account earn compound interest for a certain number of years, the balance of the account can be calculated using a simple formula:

$$balance = principal\ (1 + rate / times)^{times * years}$$

balance is the amount of money after a certain number of years
principal is the original amount of deposit
rate is the annual interest rate as a whole value; rate of 5% is entered as 5 and not .05. In your code, you must convert the rate to a decimal value by dividing the input rate by 100
times is the number of timers per year that the interest is compounded
years is the specified number of years

Submit your Java file. Use the file format: **firstNameLastNamecit130_hw7.java** for your file name. NOTE: Java class names must being with a capital letter (i.e., FooBarcit130_hw7.java). Submit your file to the assignment dropbox in Canvas. The following is a sample run of the code. Make sure to fully test your program. **Your processing must be VERY similar to the sample run**.

**NOTE: You should always test your code with other values to make sure it works.**

**SAMPLE RUN:**

```
1. Find factorial
2. Find number of occurrence
3. Find Future value
4. End the program
Enter your choice: 4
Thanks for using my program
1. Find factorial
2. Find number of occurrence
3. Find Future value
4. End the program
Enter your choice: 1
Enter the number you want the factorial of: 5
Factorial of 5 is 120
1. Find factorial
2. Find number of occurrence
3. Find Future value
4. End the program
Enter your choice: 1
Enter the number you want the factorial of: 15
Factorial of 15 cannot be calculated
1. Find factorial
2. Find number of occurrence
```

3. Find Future value
4. End the program
Enter your choice: 2
Enter a string: Hello therE
Enter a character to consider: e
The letter e was found in Hello therE, 2 time(s)
1. Find factorial
2. Find number of occurrence
3. Find Future value
4. End the program
Enter your choice: 2
Enter a string: hello
Enter a character to consider: z
The letter z was found in hello, 0 time(s)
1. Find factorial
2. Find number of occurrence
3. Find Future value
4. End the program
Enter your choice: 3
Enter the original balance: 1000
Enter the annual interest rate: 5
Enter the number of times per year that the interest is compounded: 4
Enter the number of years for the account to earn interest: 20
The future balance is: $2701.48