Assignment 1 – Object Oriented Programming Using Java

For this assignment, you will solve problems based on what you have learned in topics of Java programming viz. **Elementary Programming, Selections, Loops**

Instructions

- Review notes of the Chapter.
- There are 21 questions in this assignment.
- **Assignment submitted after due date will not be evaluated and a score of zero will be awarded for this assignment.**
- Upload a **pdf version** of the document.

Due Date: 5 pm, August 31, 2015.

Submitting this Assignment

You will submit (upload) this assignment in Blackboard. Email/paper submissions will not be accepted.

- Write code for the program after each question in this document followed by the screen print of output.
- Questions must be answered in the given order.
- Name this document as A1_2015_John_Doe.pdf in case your name is John Doe.

Grading Criteria

Correct and to-the-point answers will be awarded full points. **This assignment has 5 points (with weightage of 5% in your overall 100 points).**

Questions:

1. Write a program that reads three edges for a triangle and determines whether the input is valid. The input is valid if the sum of any two edges is greater than the third edge.
2. Write a program to print ASCII value of all characters.
3. Write a program to find out sum of digits of a given number.
4. Write a program to find out the L.C.M. and H.C.F. of two numbers.
5. Write a program that prompts the user to enter the center coordinates and radii of two circles and determines whether the second circle is inside the first or overlaps with the first.
6. Write a program that prompts the user to enter a decimal integer and displays its corresponding binary value. Don't use Java's **Integer.toBinaryString(int)** in this program.
7. Write a program that prompts the user to enter a decimal integer and displays its corresponding hexadecimal value. Don't use Java's **Integer.toHexString(int)** in this program.

Assignment 1 – Object Oriented Programming Using Java

8. Write a program that simulates flipping a coin one million times and displays the number of heads and tails.
9. Write a program that reads integers, finds the largest of them, and counts its occurrences. Assume that the input ends with number **0**. Suppose that you entered **3 5 2 5 5 5 0**; the program finds that the largest is **5** and the occurrence count for **5** is **4**.
10. Write a program that prompts the user to enter the number of seconds, displays a message at every second, and terminates when the time expires.
11. A solution to find the greatest common divisor of two integers n1 and n2 is as follows: First find d to be the minimum of n1 and n2, then check whether d, d-1, d-2, 2, or 1 is a divisor for both n1 and n2 in this order. The first such common divisor is the greatest common divisor for n1 and n2. Write a program that prompts the user to enter two positive integers and displays the gcd.
12. Write a program to input a set of integers and count the number of primes.
13. Write a program to determine input the marks of n students in a subject and determine the frequency count of marks obtained i.e. how many students obtained 100, how many 99, how many 98 and so on up to 0.
14. Write programs to produce each of the following patterns as output:

(a)

```
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
```

(b)

```
*
* *
* * *
* * * *
* * * * *
```

(c)

```
* * * * *
 * * * *
  * * *
   * *
    *
```

15. Write a program to read an integer and reverse it. Your program output would look like this:

    12345 (input)
    54321 (output)

    (Hint: Use a combination of % and / operations to do this).

16. Write an interactive program that will convert a positive integer quantity to a roman numeral (e.g., 12 will be converted to XII, 14 will be converted to XIV, and so on). Design the program so that it will execute repeatedly, until a value of zero is read in from the keyboard.
17. An Armstrong number is one in which the sum of the cubes of digits of a number is equal to the original number. Write a program to check given number is Armstrong number or not. For example: n=153 => $1^3 + 5^3 + 3^3$ = 1+125+27= 153, so 153 is an Armstrong number.

Assignment 1 – Object Oriented Programming Using Java

18. Write a program to generate the following pyramid of digits, using nested loops. (Hint: Try to develop a general expression to print out the appropriate line)

1
232
34543
4567654
567898765
67890109876
7890123210987
890123454321098
90123456765432109
0123456789876543210

19. In a strong number, the sum of the factorials of digits of a number is equal to the original number. Write a program to check given number is strong number or not.
20. Write a program to generate multiplication tables for 1 ,2, …, 10. Each table up to 1**0** should look as follows:

2x1=2
2x2=4
...
2x10=20

21. Modify (20) so that your output now looks like this:

2x1=2 3x1=3 ... 5x1=5
2x2=4 3x2=6 ... 5x2=10
... ...
2x10=20 3x10=30 ... 5x10=50