CSE 1001: Introduction to Computer Programming

Programming Assignment-IV

(Iterative Statements-1)

Question-1:

Write a java program that gets three integer numbers from the user. Count from the first number to the second number increments by the third number. Use **for loop** to do it. Also, display the sum of numbers displayed between the first number and second number.

Sample run:

```
Enter first number: 4
Enter second number: 13
Enter third number: 3
4 7 10 13
The sum of number displayed is 34
```

Question-2:

An integer n is divisible by 9 if the sum of its digits is divisible by 9. Use this concept in your program to determine whether or not the number is divisible by 9. Test it on the following numbers: Use **while loop**.

```
n = 123456
n = 154368
n = 621594
```

Hint: Use the % operator to get each digit; then use / operator to remove the digit.

Sample run 1:

```
Enter a number: 154368
The number 154368 is divisible by 9.
```

Sample run 2:

```
Enter a number: 123456
The number 123456 is not divisible by 9.
```

Question-3:

Write a java program that takes an integer N from user, uses Math. Random () to print N random integer numbers between 1 to N, and then prints their average value. Use **do while loop**.

Sample run:

```
Enter a number: 6
Random numbers generated are: 6 4 5 2 2 5
Average of 6 random numbers are 4
```

Question-4:

Write a program that finds greatest common divisor (GCD) of two numbers using Euclid's algorithm, which is an iterative computation based on the following observation: if y divides x, the GCD of x and y is y; otherwise, the GCD of x and y is same as GCD of x % y and y.

Sample run:

```
Enter the first number: 56
Enter the second number: 98
GCD of 56 and 98 is 14.
```

Question-5:

Write a Java program to check if a number is **perfect number** or not.

(**Hints:** A number N is called **perfect number**, if the sum of factors except N as a factor is equals to the number N.

Example:
N = 28 is a perfect number as (1 + 2 + 4 + 7 + 14 = 28.)

Sample run1:

```
Enter a number: 496
496 is a perfect number.
```

Sample run2:

```
Enter a number: 490
490 is not a perfect number.
```

Question-6:

Write a java program to enter two numbers through the keyboard. Write a program to find the value of one number raised to the power of another. (Do not use Java built-in method).

Sample run:

```
Enter the base: 5
Enter the power: 4
5 to the power 4 is: 625
```

Question-7:

Write a java program to print the multiplication table of a number entered by the user.

Sample run:

```
Enter a no. for which you want to find the multiplication table:
8
The multiplication table of 8 is:

8x1=8
8x2=16
8x3=24
8x4=32
8x5=40
8x6=48
8x7=56
8x8=64
8x9=72
8x10=80
```

Question-8:

Write a program that generates a random integer number between 1 to 10 and asks the user to guess what the number is. If the user's guess is higher than the random number, the program should display "Too high, try again." If the user's guess is lower than the random number, the program should display "Too low, try again." The program should use a loop that repeats until the user correctly guesses the random number and display good guess.

Sample run:

```
Computer guess: 7

User guess: 5

Too low, try again

Computer guess: 5

User guess: 7

Too high, try again

Computer guess: 5

User guess: 5

Good guess
```

Question-9:

Write a java program to take an integer input from the user and print the input by removing all zeros.

Example: Input = 10200 then Output = 12.

Sample run:

```
Enter an integer number: 10203040

After removing 0 from number 10203040, the new number is 1234.
```

Question-10:

Write a java program to print largest power of three less than or equal to N.

Sample run:

```
Enter a number: 100

The largest power of 3 less than or equal to 100 is 81
```

Home Assignment (Iterative Statement-1)

Question-1:

Write a java program to find the difference between the sum of the squares of the first ten natural numbers and the square of the sum.

The sum of the squares of the first ten natural numbers is:
$1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + 8^2 + 9^2 + 10^2 = 385$

The square of the sum of the first ten natural numbers is:
$(1 + 2 + ... + 10)^2 = 55^2 = 3025$

Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is 3025 – 385 = 2640.

Question -2:

If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23. Write a java program to find the sum of all the multiples of 3 or 5 below 1000.

Question-3:

Write a java program in which using one for loop and one if statement, prints the integers from 1,000 to 2,000 with five integers per line. **Hint:** Use the % operation.

Question-4:

Write a java program to print the sum of all even numbers and the product of all odd numbers from 1 to N. Where, N is the input to the program.

```
For input, N = 10
Sum of all even numbers = 2 + 4 + 6 + 8 + 10 = 30
Product of all odd numbers = 1 * 3 * 5 * 7 * 9 = 945
```

Question-5:

Write a java program to print the following output using loop. Where, input is the number of rows in output pattern.

For input, N = 4.

```
1
121
1213121
121312141213121
```

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