CSE 1001: Introduction to Computer Programming

Programming Assignment-VI

(Methods & String)

Question-1:

Design a Simple Calculator using methods in java containing the following functionalities, namely, with Addition, Subtraction, Multiplication, Remainder, Division and Square Root. The signature of the methods are given below.

- `public static int additionSimple(int x, int y)`
  - Two inputs, x and y. Return the result of adding x to y.

- `public static int subtractionSimple(int x, int y)`
  - Two inputs, x and y. Return the result of subtracting x from y i.e y-x.

- `public static int multiplicationSimple(int x, int y)`
  - Two inputs, x and y. Return the result of multiplying x to y i.e. x*y.

- `public static double divisionSimple(int x, int y)`
  - Two inputs, x and y. Return the result of dividing y by x. Please check whether x is zero before dividing.
- `public static int remainderSimple(int n, int m)`
  - Please make sure that remainderSimple() takes two inputs, namely, a number (int) n and a number (int) m. The method should return the remainder of n divided by m.

- `public static double squareRootSimple(int n)`
  - Takes one input, namely a number n, and returns the square root of the number. The return should be double. Please kindly make sure that the number n is positive.

Question-2:

A pentagonal number is defined as n (3n–1)/2 for n = 1, 2, . . ., and so on. Therefore, the first few numbers are 1, 5, 12, 22, ...
Write a method with the following header that returns a pentagonal number:

`public static int getPentagonalNumber(int n)`

Write a java program that uses this method to display the first 100 pentagonal numbers with 10 numbers on each line.

Question-3:

Write the methods with the following headers
// Return the reversal of an integer. Example: `reverse (456)`, returns 654

```
public static int reverse(int number)
```

// Return true if number is a palindrome

```
public static boolean isPalindrome(int number)
```

Use the reverse method to implement isPalindrome. A number is a palindrome if its reversal is the same as itself. Write a java program that prompts the user to enter an integer and reports whether the integer is a palindrome.

Question-4:

Write a method that returns the number of days in a year using the following header:

public static int numberOfDaysInAYear(int year)

Write a java program that displays the number of days in year from 2000 to 2020.

Question-5:

A regular polygon is an *n*-sided polygon in which all sides are of the same length and all angles have the same degree (i.e., the polygon is both equilateral and equiangular). The formula for computing the area of a regular polygon is

$$\text{Area} = \frac{n \times S^2}{4 \times \tan\left(\frac{\pi}{n}\right)}$$

Write a method that returns the area of a regular polygon using the following header:

```
public static double area(int n, double side)
```

Question-6:

Write a method that finds the number of occurrences of a specified character in a string using the following header:

```
public static int count(String str, char a)
```

For example, `count ("Welcome", 'e')` returns 2.

Write a java program that prompts the user to enter a string followed by a character and displays the number of occurrences of the character in the string.

Question-7:

Write java method called *count* accepts a string as input and returns the number of vowels in it. The method header is given below.

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

For example, `count ("Welcome")` returns 2.

Question-8:

Write a java method to check a string is palindrome or not.

Question-9:

Some websites impose certain rules for passwords.
Write a method that checks whether a string is a valid password. Suppose the password rules are as follows:

- A password must have at least eight characters.
- A password consists of only letters and digits.
- A password must contain at least two digits.

Write a program that prompts the user to enter a password and displays *Valid Password* if the rules are followed or *Invalid Password* otherwise.

Question-10:

Write a java program to calculate the area of triangle, square, circle, rectangle by using method overloading.

Home Assignment (Methods & Strings)

Question-1:

Write a program to find the first non-repeated character in a given String, for example, if the given String is "Java" then the first non-repeated character is "J".

Question -2:

Write a java program to calculate the volume of sphere, cuboid and cube by using method overloading.

Volume of a cube = s * s * s [s: Side of the cube]

Volume of a Sphere = $\frac{4}{3} \times \pi \times r^3$ [r: radius]

Volume of a cuboid = L × b × h [L: Length, b: Breadth, h: Height]

Question-3:

Write a Java method to display the middle character of a string.

Note:

a) If the length of the string is odd there will be one middle characters.
b) If the length of the string is even, then there would be two middle characters, we need to print the second middle character.

Example:
Input a string: ABC

Expected Output:

```
The middle character in the string: B
```

Example:
Input a string: JAVA

Expected Output:

```
The middle character in the string: V
```

Question-4:

Write a Java method to count all words in a string.

Example:

```
Input the string:

The quick brown fox jumps over the lazy dog.
```

Expected Output:

```
Number of words in the string: 9
```

Question-5:

Write a Java method that accept three integers and check whether they are consecutive are not. Return true or false.

Expected Output:

```
Input the first number:  15
Input the second number:  16
Input the third number:  17
Check whether the three said numbers are consecutive or not!
true
```

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