Challenging Questions to do in Java

1. PALINDROME

Write a program that takes an English word and test whether or not this word is a palindrome. (e.g. a word that reads the same both forwards and backwards such as "level").

2. ALL IS NOTHING

Consider the sequence of digits from 1 through N (N<=9) in increasing order: 1 2 3 4 ... N Insert either a '+' (for addition) or a '-' (for subtraction) between each of the digits so that the resultant sum is zero. Print all possible combinations that sum to zero.

Example: Enter a number: 7 1+2-3+4-5-6+7=0 1+2-3-4+5+6-7=0 1-2+3+4-5+6-7=0 1-2-3-4-5+6+7=0

3. ROTATE THE SQUARE

Imagine a square pattern divided into smaller squares as shown below. As you can see seven of the smaller squares are filled in. If this is rotated *clockwise* by 90 degrees and placed on top of the original pattern then more squares are filled in.

The total number of filled in squares is now 13. Continuing in this way you can again rotate and add the original pattern to the combination giving 19 black squares and one more rotation + addition gives 25 black squares.

You must write a program that will read in a square pattern and output the original number of black squares and the number that result from each rotation.

Input:

- an integer N on a single line
- the next N lines consist of the NxN square,

(where 1 represents a black square and 0 represents a white square)

Output:

- four lines containing the number of black squares before each rotation

Example 1 :

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nput:	5	Output:	7
	10100	*	13

	01100		25
	01000		
	00000		
Exampl	e 2:		
Input:	4	Output:	3
	0000		6
	0100		7
	0010		8
	0001		

4. SQUARE ENCRYPT

10001

A secret code encrypts a message by putting it in an array and reading down the columns (blanks are replaced by asterisks and full stops are added to fill up the array).

19

Write a program that encrypts an input string. (For extra marks write a program that decrypts a given string using the rules outlined above.)

LETS*G O*TO*T HE*SAN DWICH* SHOP*T ODAY..

Example:

Input: **"Lets go to the sandwich shop today"** Output: "Lohdsoe*ewhdtt*ioasoscpy**ah*.gtn*t."