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**Question 1:**

Write a program that reads an integer number  $x$  ( $x > 0$ ) and an integer number  $y$  ( $y > 0$ ) from the user, then displays the value of the following sum:

$$s = 1 + x^2 + 2x^3 + 3x^4 + \dots$$

The program stops when the value of  $s$  becomes  $\geq y$ . The program must then display the value of  $s$ .

**Question 2:**

Write a program that reads an integer  $n$  from the user such that ( $1 \leq n < 10$ ). This program must calculate and display the sum  $s$  of  $n$  terms:  $s = 11 + 22 + 33 + \dots + nn$ .

Example: for  $n=3$ ,  $s=11+22+33$

for  $n=4$ ,  $s=11+22+33+44$

**Question 3:**

Write a program that reads an integer  $n > 0$  from the user and displays a figure of Z stars having  $n$  as height and  $n$  as width. For example for  $n=5$ , the program must display:

```
*****  
---*  
--*  
-*  
*****
```

**Question 4:**

Write a program in C that:

- Declares a matrix of integers  $M[6][6]$  and fills the elements of  $M$  such that: the elements of the main diagonal must be 0 and the other elements must be strictly positive.
- Displays the position  $(i,j)$  of the maximum of each line.
- Displays all the elements of the matrix  $M$  that end by 7 (ex: 7, 17, 27, ...).

**Question 5:**

Write a C program that:

- Declares an array of integers  $A[20]$ .
- Fills the elements of the array  $A$  by strictly positive numbers.
- Displays all the elements of the array  $A$  which are powers of 2 (ex : 2, 4, 8, 16, ...).

Good Luck