Q1. Write a C++ program to print the perfect square number pattern series, using 2D array.

**Example**

**Input**

Input N: 10

**Output**

[1 2 3 4 5 6 7 8 9 10](javascript:%20void(0);)

[36 37 38 39 40 41 42 43 44 11](javascript:%20void(0);)

[35 64 65 66 67 68 69 70 45 12](javascript:%20void(0);)

[34 63 84 85 86 87 88 71 46 13](javascript:%20void(0);)

[33 62 83 96 97 98 89 72 47 14](javascript:%20void(0);)

[32 61 82 95 100 99 90 73 48 15](javascript:%20void(0);)

[31 60 81 94 93 92 91 74 49 16](javascript:%20void(0);)

[30 59 80 79 78 77 76 75 50 17](javascript:%20void(0);)

[29 58 57 56 55 54 53 52 51 18](javascript:%20void(0);)

[28 27 26 25 24 23 22 21 20 19](javascript:%20void(0);)

HINT: You can have two variables “left” & “top” which maintain the information of storing mechanism. “You will be needing at least four for loops”.

**OR**

Q1. Implement the function compress, the compresses a 2D array to size R x 8, and compresses it to size (R-2) x 6. The compression is done as follows: taking a slot and its 8 neighboring cells, and calculate their average. Store the average in output.

void compress(int input[][8], int output[][6], int R)

Note: the number of rows of input must be exactly 2 more than output.

The working of the function is explained in the diagram below:

Input (7x8):

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 3 | 2 | 3 | 4 | 5 | 7 | 8 |
| 2 | 2 | 1 | 8 | 3 | 4 | 5 | 2 |
| 3 | 4 | 5 | 7 | 2 | 1 | 4 | 6 |
| 9 | 1 | 2 | 3 | 1 | 5 | 3 | 4 |
| 7 | 8 | 8 | 8 | 9 | 4 | 6 | 65 |
| 7 | 6 | 11 | 2 | 1 | 3 | 5 | 6 |
| 3 | 4 | 5 | 66 | 7 | 1 | 9 | 0 |

Output(5x6):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2 |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  | 5 |  |

Q2. Input a string from user and remove every white space and give options to him for 1,2,3 to UPPER, lower and Sentence case respectively. And convert respectively in separate function.

**Input: I am a boy, and I LOVE to eat.**

**Give choice:**

1. UPPER
2. lower
3. Sentence

Choice : 1

**IAMABOY,ANDILOVETOEAT.**

Choice: 2

**iamaboy,andilovetoeat.**

Choice: 3

**I Am A Boy, And I Love To Eat.**