These problems are ONLY meant for your practice.

Write a program that reads in a number n using cin. It should print out the letter T using '*' characters with each line in the T having width n. Further, the length of the horizontal bar should be 3n, and that of the vertical bar 2n. Look at the sample output for clarity.
Note: To print characters on a new line write '**\n**' in the cout statement. For example:
cout << "hello" << "\n" << "bye"; will print **hello** on the first line and **bye** on the 2nd line.

Note: Use **cin** statement for input
Sample Input: 3
Sample output:

```
*********
*********
*********
  ***
  ***
  ***
  ***
  ***
  ***
```

Filename for code: **Tee.cpp**

Write a program that prints a zig-zag pattern. The pattern is as follows: the first line prints 5 space-separated **'*'** characters. The second line starts after 2 spaces, and prints 5 space-separated **'*'** characters. Accept a number '**n**' from the user using **'cin'**. The number of zig-zag lines to be printed should be '**2*n**'. Look at the example provided below. **Note**:To put space between the two characters, Use **cout << " ";**
Filename: zigzag.cpp

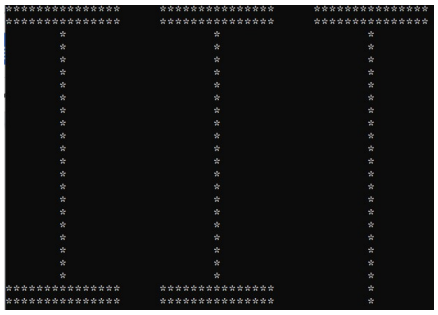
Sample Input:
4

Sample Output:

```
* * * * *
 * * * * *
* * * * *
 * * * * *
* * * * *
 * * * * *
* * * * *
 * * * * *
```

Write a program that prints IIT using '*'. Adjust the sizes of your I and T as you want. The only requirement is that their heights must be the same.
Filename: IIT.cpp

Sample Output:



Draw a half pyramid using the character ***.** Your program should take input **n** using **'cin'** and draw a half pyramid with **n** rows. Given is an example half pyramid for **n=5. [Hint:** You've to use a counter variable, say **i**. Make the counter 0 before starting the repeat**()** loop and increase it inside the repeat() loop. At **i**th row, you should print the character *** i** times using a nested loop.]
Filename: half-pyramid.cpp]

```
*
* *
* * *
* * * *
* * * * *
```

Challenge Problems:

(1) Write a program in C++ to check whether a number is prime or not.
    (a) Input : 13
    (b) Output : True
(2) Write a program in C++ to find prime numbers within a range.
    (a) Input : 1 100
    (b) Output : 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97

Fun Problem:

I want to calculate **A%b** where A is very large number that can't be stored in **int** data type, whereas you can store b in **int.** Fortunately, we know n integers whose product will give us A. A=a_1*a_2*a_3*.....*a_n.
I will give you n integer (a_1, a_2, a_3..., a_n) and b, you have to give me A%b, where A is same as defined above.
Write your approach in reply.
One might think we can store the product in an int variable and then will take %b but in that case the product will be too large to be stored in int, values will overflow and will give you some nonsense result.