Lab 3 - Questions

Question 1. Write a program that reads an integer (N), and prints all the perfect numbers smaller than smaller than N as integers.

NOTE: A perfect number is defined as follows: Any positive number whose sum of its positive divisors except itself is equal to itself.

(e.g., 6 and 28 are perfect numbers (6 = 1 + 2 + 3), (28 = 1 + 2 + 4 + 7 + 14):

Input	7	500	1000
Output	6	6 28 496	6 28 496

Question 2. Write a program that reads an integer value (N), and computes the sum of the second powers of each digit as an integer.

(e.g., N = 572, the output will be $2^5 + 2^7 + 2^2 = 32 + 128 + 4 = 164$

Input	572	1452	9502
Output	164	54	549

Question 3.

Write a program that displays the following shape (i.e., sand hour) with '*' and ' ' characters. The height of one side of the hour glass will be given as an integer (height).

(e.g., height = 4, the output will be like this;

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

1st row: 7 star characters
2nd row: 1 blank character + 5 star characters
3rd row: 2 blank characters + 3 star characters
4th row: 3 blank characters + 1 star character
5th row: 3 blank characters + 1 star character
6th row: 2 blank characters + 3 star characters
7th row: 1 blank character + 5 star characters
8th row: 7 star characters

Input

4

5

Output

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

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