(1) Print all **distinct** permutations of "BANGLADESH". Calculate the count of distinct permutations in your code. Also calculate the count using combinatorial approach (using calculator). Do they match ?

(2) You'll be given n and S. Print all the integer solutions for,
$x_1 + x_2 + x_3 + ... + x_n = S$
$x_1, x_2, ..., x_n >= 0$

For example, for n = 3, S = 4
The solutions are:

(0,0,4)
(0,1,3)
(0,2,2)
(0,3,1)
(0,4,0)
(1,0,3)
(1,1,2)
(1,2,1)
(1,3,0)
(2,0,2)
(2,1,1)
(2,2,0)
(3,0,1)
(3,1,0)
(4,0,0)

(3) Given base, power and M find (base^power)%M. You must do it on O(log(power)) time complexity.

(4) Given a large integer N (with at most 100 digits), for all its suffix, you have to find the remainder when divided by M. For example,
N = 12345, M = 6
Suffixes are:

12345
2345
345
45
5
For all suffixes, dividing by 6, we have to output the remainder:
3
5
3
3
5

You must solve it in O(# of digits of N) time complexity.

(5) Given a large integer N (with at most 100 digits), for all its prefixes, you have to find the remainder when divided by M. For example, N = 12345, M = 6
prefixes are:
12345
1234
123
12
1
For all prefixes, dividing by 6, we have to output the remainder:
3
4
3
0
1

You must solve it in O(# of digits of N) time complexity.

(6) Given a large integer N (with at most 100 digits), find the sum of all
    substring numbers modulo M. For example,

      N = 1234, M = 6

      Sum of all substrings:

      1 + 2 + 3 + 4 + 12 + 23 + 34 + 123 + 234 + 1234 = 1670

      Output: 1670%6 = 2

    Bonus: Can you solve it in O(# of digits of N) time complexity ?