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1. Write a program for implementing each of the following functions (don't use string library functions):
    a. Compute the length of a string
        Fn declaration : **int strlen(char *str);**
    b. Copy a string from one location to another
        Fn declaration : **char *strcpy(char *dest, char *src)**;
    c. Concatenate two strings 'dest' and 'src'
        Fn declaration : **char *strcat(char *dest, char *src);**
    d. Returns 1 if the string *t* occurs at the end of string *s*, and otherwise returns 0
        Fn declaration : **int strend(char *s, char *t)**;
    e. Check if the given string is a palindrome or not return 1 is Yes or return 0 if No.
        Fn declaration : int **checkPalindrome(char *s);**
    f. Reverse a given string
        Fn declaration : **char *reverse(char *original);**

2. Write a program to find the number of times that a given word (i.e. a short string) occurs in a sentence (i.e. a long string!). Read data from standard input. The first line is a single word, which is followed by general text on the second line.

   Sample Input
   the
   the cat sat on the mat

   Sample Output
   2

3. Given a string(it can have all possible letters), you have to count the frequency of occurrence of each character in a newline terminated string by using an array of structures as following: Initially no memory is allocated for any of the letters.

   Sample Input
   ccbbbbaaccaaz (

   Sample Output
   c 4
   b 4
   a 4
   z 1
     1
   (1

Notice that space character has occurred once in the input above (look at the outline line with bold **1**).

4. Write a program to encode a given message. The encoding algorithm first performs reverse operation on each word and then transforms each character into its third successor in the series. (considers series of characters arranged in a circle so last characters like **x** will have **a** as third successor) For an example, the message "have a good day" will be encoded as "hydk d grrj bdg". Your program should also be able to decode a given coded message into its original form i.e. if I give an encoded message it should decode the original message.

5. Write a program that read n and find the last 10 digit of 2^n where $0 <= n <= 100$. You have to take care of how to handle large numbers.

   Sample Input
   10

   Sample Output
   1024

6. You have infinitely many balls and each of them is colored with one of the C colors. You decided to fill each of the N boxes (B_1, B_2, B_3, ..., B_N) with exactly one ball. In how many ways can you do that? Two ways are considered different if there is at least one box in one way that has different colored ball than in the other way. The answer can get really huge, so just output the (answer%P), where % is the modulus operator. Input contains one line containing integers C N P

   Sample Input
   2 4 10

   Sample Output
   6\n

   Explanation: We have 4 boxes and 2 colors. Each box has 2 options, so answer is just 2 x 2 x 2 x 2 = 16 and 16 % 10 = 6

7. Given an integer N ($0 \leq N \leq 10^{18}$) (use long long), count the number of 1s in the binary representation of N

   Sample Input
   5

   Sample Output
   2

8. Ramesh is learning to chat on Facebook and he wants to say "goodbye" (*no space between good and bye*) to his friend Suresh. Ramesh typed the word **w**. It is considered that Ramesh managed to say "goodbye" if several letters can be deleted from the typed word **w** so that it results in the

word "goodbye". For example, if Ramesh types the word "btagpotodbqqyeekje", it will be considered that he said "goodbye", and if he types "pngodtbeyz", it will be considered that he didn't manage to say goodbye. Determine whether Ramesh managed to say "goodbye" by the given word **w** to Suresh.

Sample Input-1
btagpotodbqqyeekje
Sample Output-1
Yes

Explanation: b,t,a,p,t,q,q,e,k,j,e can be deleted to get goodbye

Sample Input-2
pngodtbeyz
Sample Output-2
No

9. You are given two matrices $A_{m \times p}$ and $B_{p \times n}$
    Find $AB_{m \times n}$ and only print the sum of all elements in AB . You will read first m and p and then elements of matrix A then p and n and then elements of matrix B.

    Sample Input
    2 3
    9 2 1
    4 5 6
    3 1
    1
    2
    3

    Sample Output
    48\n

10. Write a program to read n and find the value of n! , where $0 \leq n \leq 200$. You have to take care of how to handle large numbers.

    Sample Input
    5
    Sample Output
    120