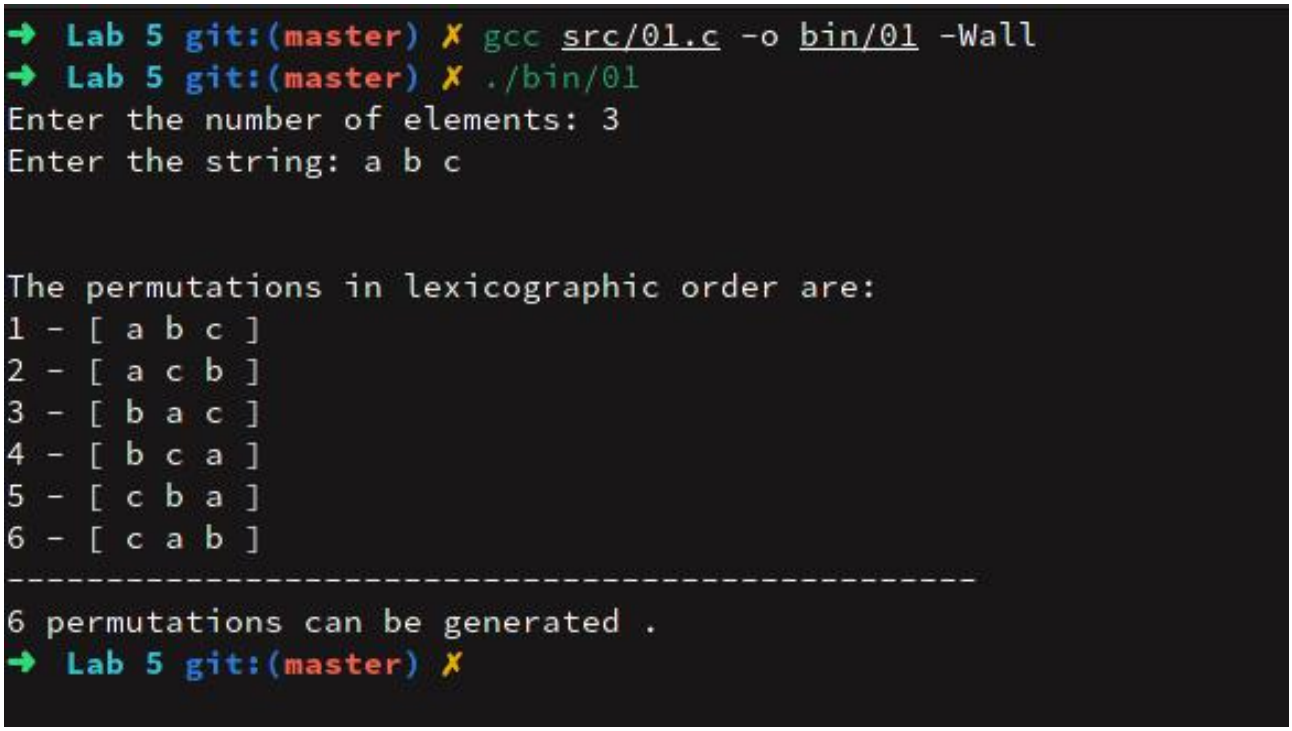
1. Write a program to generate permutations

Source Code:

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>

void swap(char *x, char *y)
{
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}
int fact(int n){
    if(n == 0 )        return 1;
    else               return n * fact(n - 1);
}

void permute(char *arr, int left, int right)
{
    int i;
    static int j = 0;
    if (left == right-1)
        printf("%d - [%s]` \n",++j, arr);
    else{
        for (i = left; i < right; i++){
            swap((arr+ left), (arr+ i));
            permute(arr, left + 1, right);
            swap((arr+ left), (arr+ i)); //backtrack
        }
    }
}

int main()
{
    int num;
    printf("Enter the number of elements: ");
```

```
    scanf("%d", &num);

    char *str1 = malloc(num *sizeof(char *));

    printf("Enter the string: ");
    for (int i = 0; i < num; i++)
        scanf("%s", &str1[i]);
    printf("\n\nThe permutations in lexicographic order are:\n");
    permute(str1, 0, num );
    int k = fact(num);
    printf("\n**********************************************\n\n");
    printf("%d permutations can be generated .\n", k);
    return 0;
}
```

Output:



2. Write a program to generate combination

Source Code:

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>

int fact(int n){
    if(n == 0 )         return 1;
    else                return n * fact(n - 1);
}

void combinationUtil(char* arr, char *data, int start, int end, int index, int
r){
    if (index == r){
        static int k = 0;
        printf("%d - [ ",++k);
        for (int j = 0; j < r; j++)
            printf("%c ", *(data + j));
        printf("]\n");
    }
    for (int i=start; i<=end && end-i+1 >= r-index; i++){
        data[index] = arr[i];
        combinationUtil(arr, data, i+1, end, index+1, r);
    }
}
void printCombination(char arr[], int n, int r){
    char data[r];
    combinationUtil(arr, data, 0, n-1, 0, r);
}



// Driver program to test above functions
int main()
{
    int r,num;
    printf("Enter the number of elements of the array: ");
    scanf("%d", &num);
```

```
    char *str =(char *) malloc(num *sizeof(char *));
    printf("Enter the elements of array: ");
    for (int i = 0; i < num; i++)
        scanf("%s", (str + i));

    printf("Enter the number of elements to select: ");
    scanf("%d", &r);

    int combination;
    combination = fact(num) / (fact(r)*fact(num - r));

    printf("\nThe %d-combination of a set with %d distinct elements is %d and\n\
all the combination are:\n",r,num, combination);
    printCombination(str, num, r);
}
```

Output: