

Aim:

Write a C program that takes an array of n integers and counts the number of increasing subsequences in the array of size k .

Input Format:

- The first line reads an integer n representing the size of the array.
- The next line reads n space-separated integers representing the elements of the array.
- The next line reads an integer representing the value of k .

Output Format:

- The output is an integer representing the count of increasing subsequences in the array.

Note:

- Elements of the subsequences need not be consecutive.
- Refer to visible test cases for better understanding and to produce the exact input-output format.

Source Code:subsequences.c

```
#include<stdio.h>
int main(){
    int n,k;
    printf("Enter the size: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements: ");
    for(int i=0;i<n;i++)
    {
        scanf("%d", &arr[i]);
    }
    printf("value of k: ");
    scanf("%d", &k);
    int dp[n+1][k+1];
    for(int i=0;i<=n;i++)
    {
        for(int j=0;j<=k;j++)
        {
            dp[i][j] = 0;
        }
    }
    for(int i=1;i<=n;i++)
    {
        dp[i][1]=1;
    }
    for(int i=1;i<=n;i++)
    {
        for(int j=2;j<=k;j++)
        {
            for(int l=i-1;l>=1;l--)
            {
                if(arr[l] < arr[i])
                    dp[i][j] += dp[l][j-1];
            }
        }
    }
    printf("The number of increasing subsequences of size %d in the array is %d", k, dp[n][k]);
}
```

```

        if(arr[i-1]>arr[l-1])
        {
            dp[i][j] +=dp[l][j-1];
        }
    }
}

int result = 0;
for(int i=1;i<=n;i++)
{
    result += dp[i][k];
}
printf("Result: %d\n", result);
return 0;
}

```

Execution Results - All test cases have succeeded!

Test Case - 1

User Output

Enter the size: 5

Enter the elements: 1 2 3 0 -1

value of k: 3

Result: 1

Test Case - 2

User Output

Enter the size: 5

Enter the elements: 10 11 12 13 15

value of k: 3

Result: 10