

C++

Assignment – Program

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1)

```
#include <bits/stdc++.h>
using namespace std;

void countsubarray()
{
    int arr[] = {10, 2, 4, 1, 9, 7, 2, 1, 2};
    int k = 10;

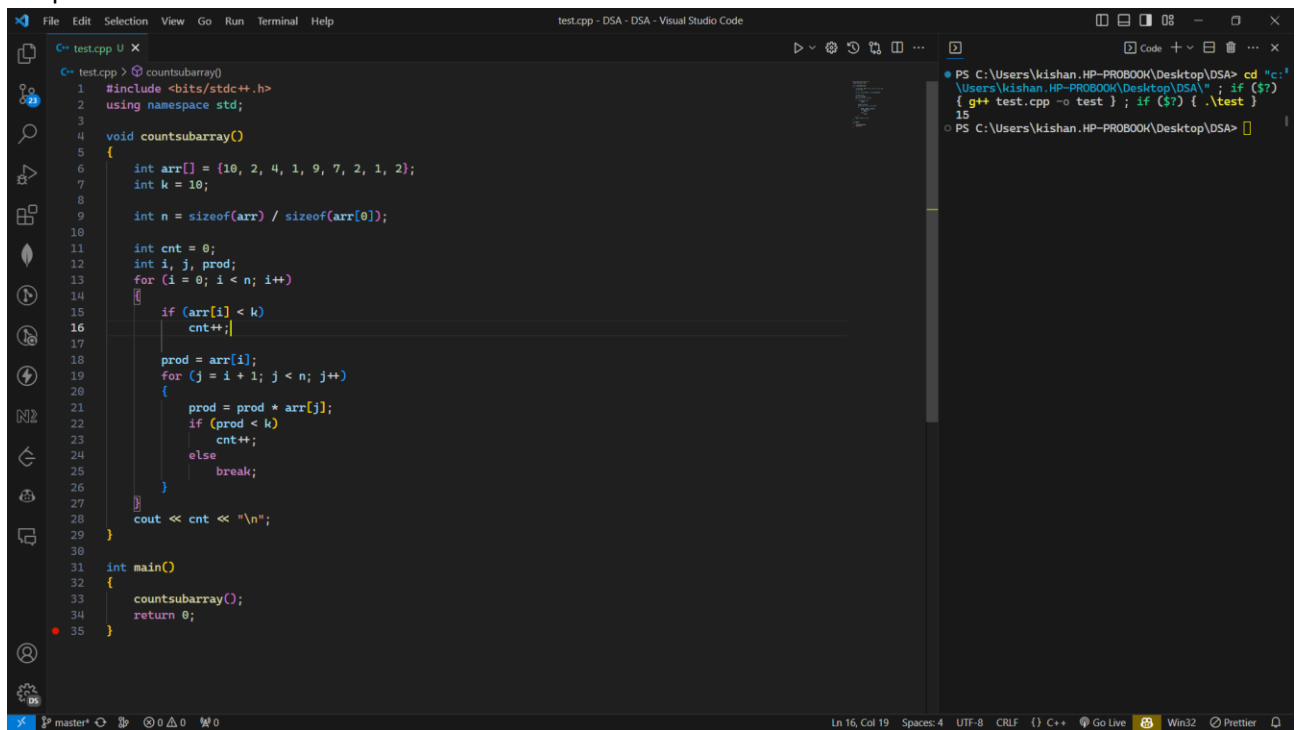
    int n = sizeof(arr) / sizeof(arr[0]);

    int cnt = 0;
    int i, j, prod;
    for (i = 0; i < n; i++)
    {
        if (arr[i] < k)
            cnt++;

        prod = arr[i];
        for (j = i + 1; j < n; j++)
        {
            prod = prod * arr[j];
            if (prod < k)
                cnt++;
            else
                break;
        }
    }
    cout << cnt << "\n";
}

int main()
{
    countsubarray();
    return 0;
}
```

Output:



The screenshot shows the Visual Studio Code editor with a C++ file named `test.cpp`. The code defines a function `countsubarray()` that counts the number of subarrays with a product less than or equal to `k`. The array `arr` is `{10, 2, 4, 1, 9, 7, 2, 1, 2}` and `k` is `10`. The `main` function calls `countsubarray()` and prints the result. The output window on the right shows the command prompt execution: `PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "C:\Users\kishan.HP-PROBOOK\Desktop\DSA" ; if ($?) { g++ test.cpp -o test } ; if ($?) { .\test } 15 PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>`

```
1 #include <bits/stdc++.h>
2 using namespace std;
3
4 void countsubarray()
5 {
6     int arr[] = {10, 2, 4, 1, 9, 7, 2, 1, 2};
7     int k = 10;
8
9     int n = sizeof(arr) / sizeof(arr[0]);
10
11     int cnt = 0;
12     int i, j, prod;
13     for (i = 0; i < n; i++)
14     {
15         if (arr[i] < k)
16             cnt++;
17
18         prod = arr[i];
19         for (j = i + 1; j < n; j++)
20         {
21             prod = prod * arr[j];
22             if (prod < k)
23                 cnt++;
24             else
25                 break;
26         }
27     }
28     cout << cnt << "\n";
29 }
30
31 int main()
32 {
33     countsubarray();
34     return 0;
35 }
```

2)

```
#include <bits/stdc++.h>
using namespace std;

void maxLength()
{
    string s = "00100011101";

    int n = s.size();
    int i = 0, j = 0;

    int maxi = INT_MIN;

    int noofzeros = 0;
    for (j = 0; j < n; j++)
    {
        if (s[j] == '0')
        {
            noofzeros++;
        }
        while (noofzeros > 1)
        {
```

```

        if (s[i] == '0')
        {
            noofzeros--;
        }
        i++;
    }
    maxi = max(maxi, j - i + 1);
}
cout << maxi;
}

int main()
{
    maxLength();
    return 0;
}

```

Output:

The screenshot shows the Visual Studio Code editor with a C++ file named `test.cpp`. The code is the same as shown in the first block. The output window on the right shows the command prompt output:

```

PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "c:\Users\kishan.HP-PROBOOK\Desktop\DSA" ; if ($?) { g++ test.cpp -o test } ; if ($?) { .\test }
5
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

```

The status bar at the bottom indicates the file is `test.cpp`, line 18, column 25, with 4 spaces, UTF-8 encoding, CRLF line endings, C++ language, and the Go Live extension is active. The window title is `test.cpp - DSA - DSA - Visual Studio Code`.

3)

```
#include <bits/stdc++.h>
using namespace std;

void maxSubarrayLen()
{
    int arr[] = {3, 1, 2, 0, 4, 2, 1, 1, 5};
    int n = sizeof(arr) / sizeof(arr[0]);
    int target = 8;
    map<int, int> mp;

    int totalSum = 0;
    int ans = 0;
    int pos1 = -1, pos2 = -1;

    for (int i = 0; i < n; i++)
    {
        if (arr[i] == target)
        {
            ans = max(ans, 1);
        }
        totalSum += arr[i];

        int temp = totalSum - target;
        if (mp.find(temp) != mp.end())
        {
            int len = i - mp[temp];

            if (len > ans)
            {
                pos1 = mp[temp] + 1;
                pos2 = i;
                ans = len;
            }
        }
        if (mp.find(totalSum) == mp.end())
            mp[totalSum] = i;
    }
    cout << ans << "\n";
    for (int i = pos1; i <= pos2; i++)
    {
        cout << arr[i] << " ";
    }
}
```

```

}

int main()
{
    maxSubarrayLen();
    return 0;
}

```

Output:

The screenshot shows the Visual Studio Code editor with a C++ file named `test.cpp`. The code implements a function `maxSubarrayLen()` that finds the maximum length of a subarray with a sum of 8. The array is `{3, 1, 2, 0, 4, 2, 1, 1, 5}`. The output of the program is `0 4 2 1 1`.

```

1 #include <bits/stdc++.h>
2 using namespace std;
3
4 void maxSubarrayLen()
5 {
6     int arr[] = {3, 1, 2, 0, 4, 2, 1, 1, 5};
7     int n = sizeof(arr) / sizeof(arr[0]);
8     int target = 8;
9     map<int, int> mp;
10
11     int totalSum = 0;
12     int ans = 0;
13     int pos1 = -1, pos2 = -1;
14
15     for (int i = 0; i < n; i++)
16     {
17         if (arr[i] == target)
18         {
19             ans = max(ans, 1);
20         }
21         totalSum += arr[i];
22
23         int temp = totalSum - target;
24         if (mp.find(temp) != mp.end())
25         {
26             int len = i - mp[temp];
27
28             if (len > ans)
29             {
30                 pos1 = mp[temp] + 1;
31                 pos2 = i;
32                 ans = len;
33             }
34         }
35         if (mp.find(totalSum) == mp.end())
36             mp[totalSum] = i;
37     }
38     cout << ans << "\n";
39     for (int i = pos1; i <= pos2; i++)
40

```

The output window shows the following command and output:

```

PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "c:\Users\kishan.HP-PROBOOK\Desktop\DSA" ; if ($?) { g++ test.cpp -o test } ; if ($?) { .\test }
0 4 2 1 1
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

```