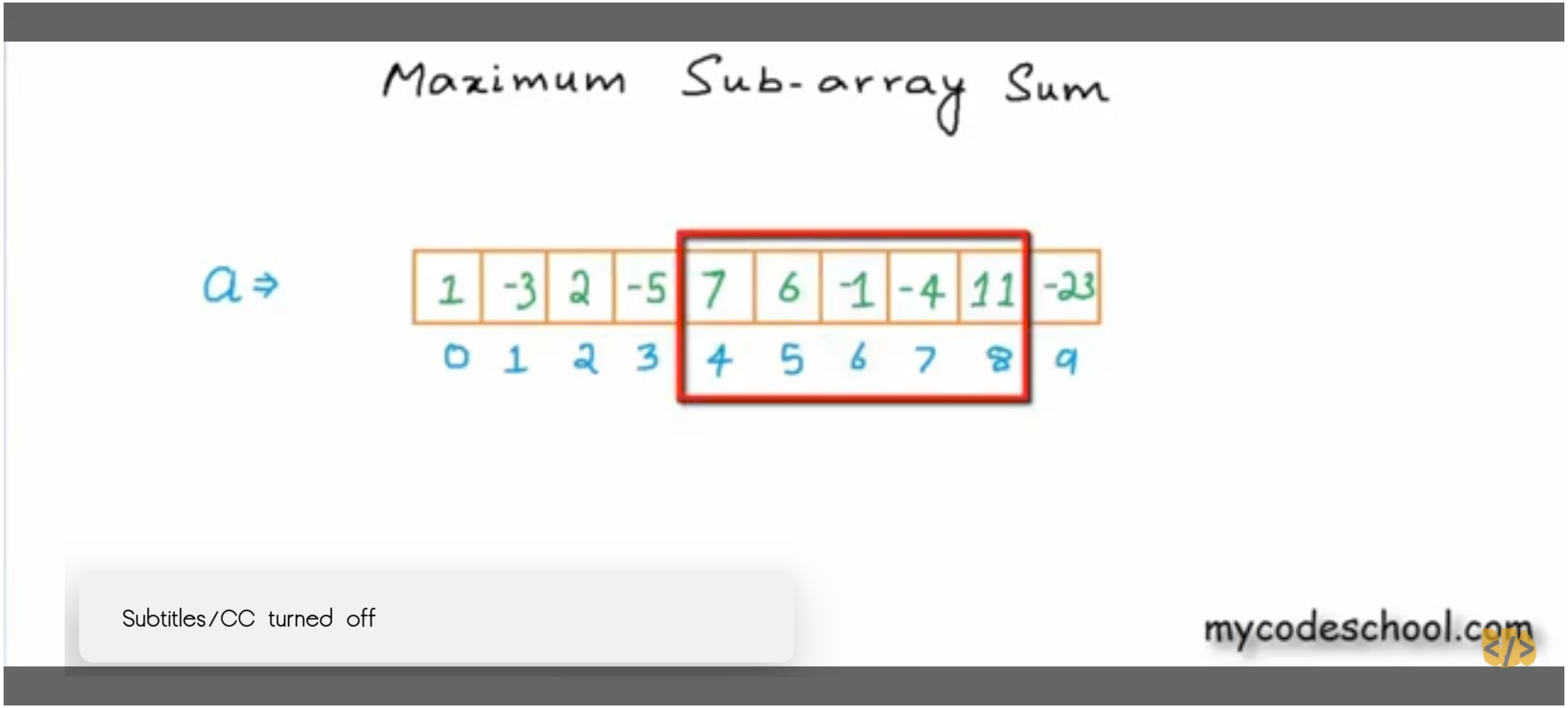

Maximum Sub-array Sum

a ⇒

1	-3	2	-5	7	6	-1	-4	11	-23
0	1	2	3	4	5	6	7	8	9

Subtitles/CC turned off

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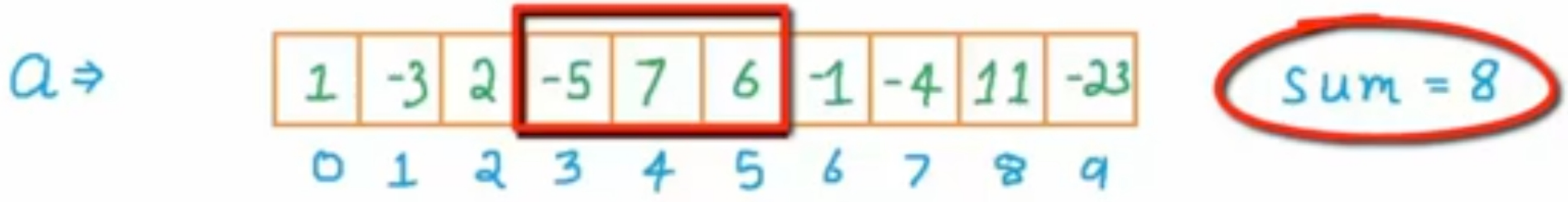
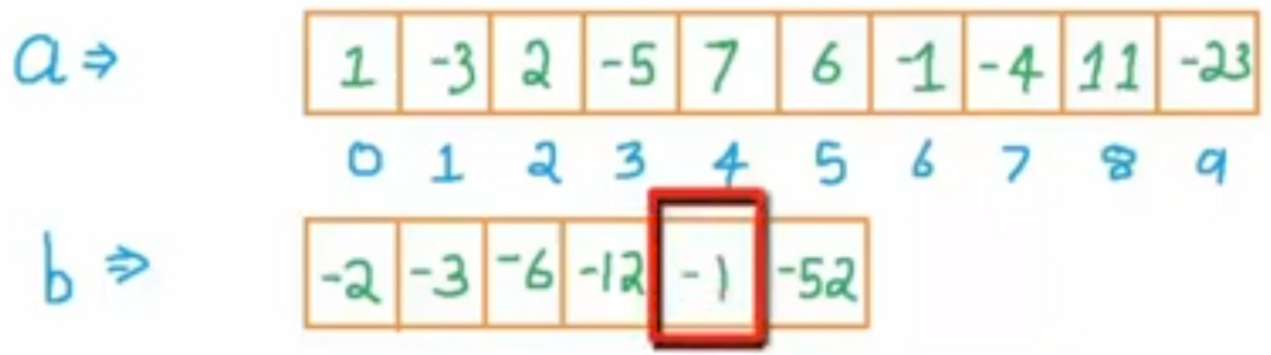
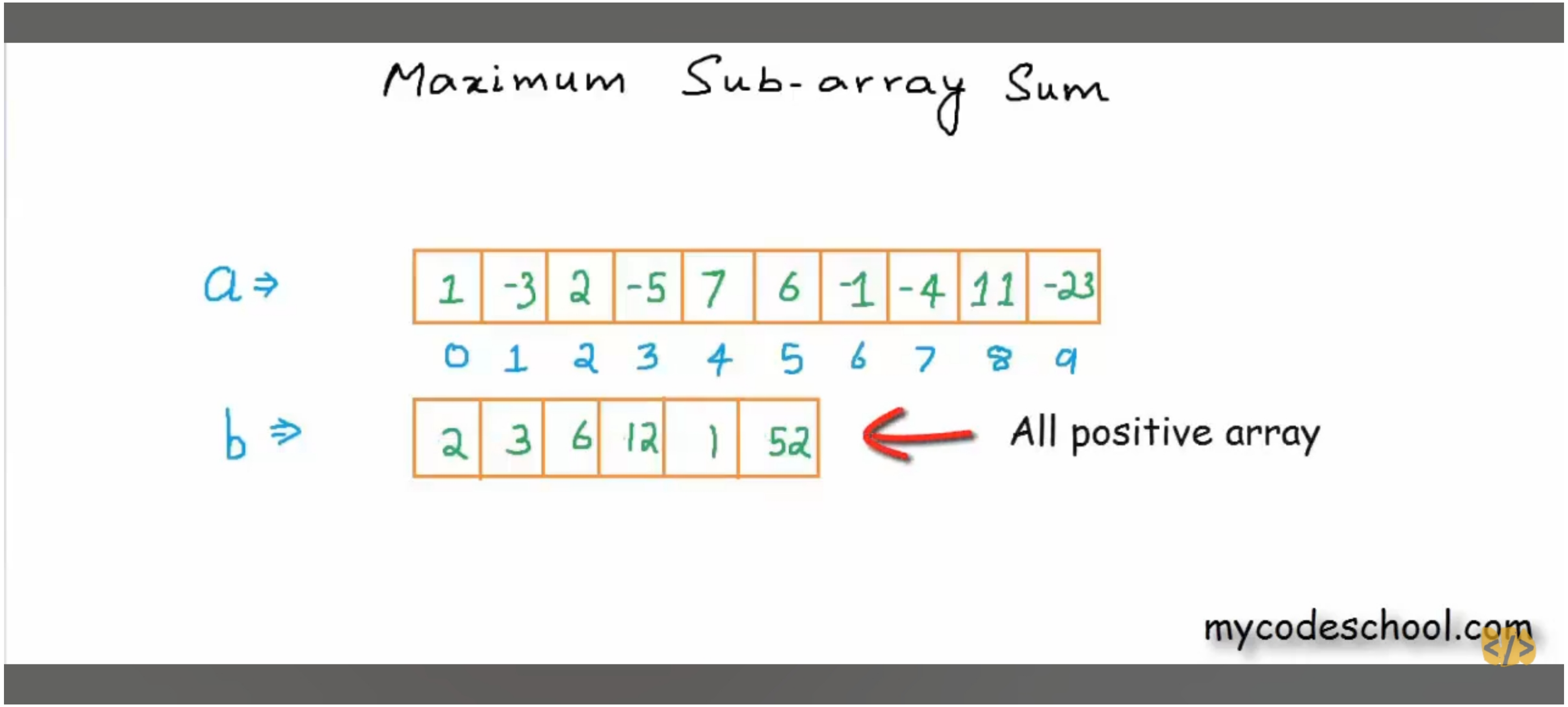
Maximum Sub-array Sum



Maximum Sub-array Sum





Maximum Sub-array Sum

a ⇒

1	-3	2	-5	7	6	-1	-4	11	-23
0	1	2	3	4	5	6	7	8	9

b ⇒

2	3	6	12	1	52

← All positive array

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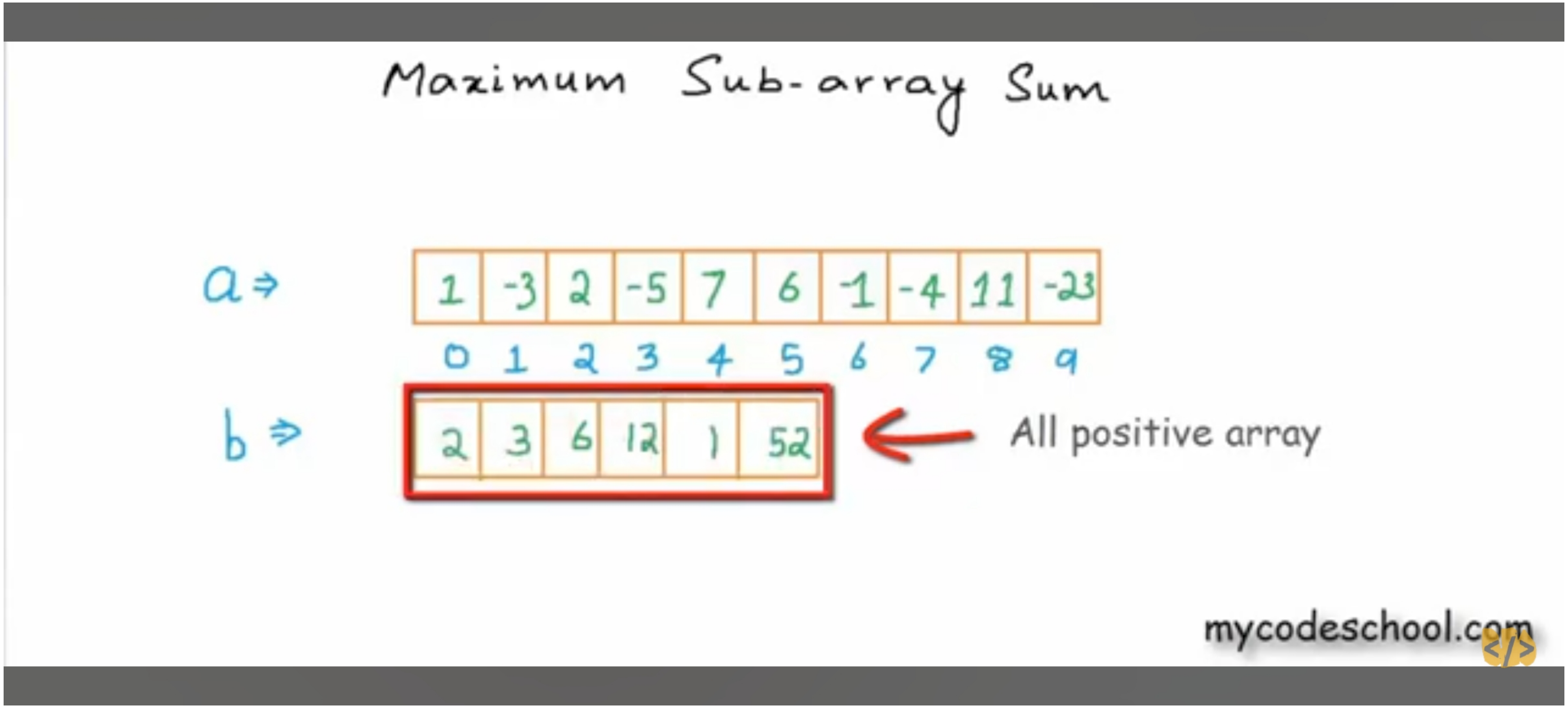


Maximum Sub-array Sum

a ⇒

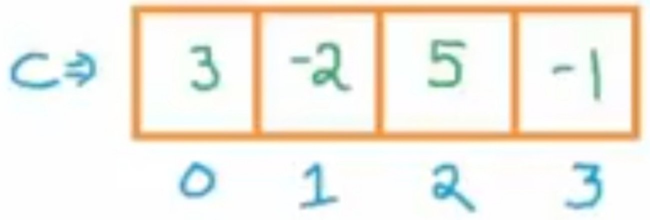
1	-3	2	-5	7	6	-1	-4	11	-23
0	1	2	3	4	5	6	7	8	9

b ⇒

2	3	6	12	1	52

Maximum Sub-array Sum

Brute-Force Algorithm



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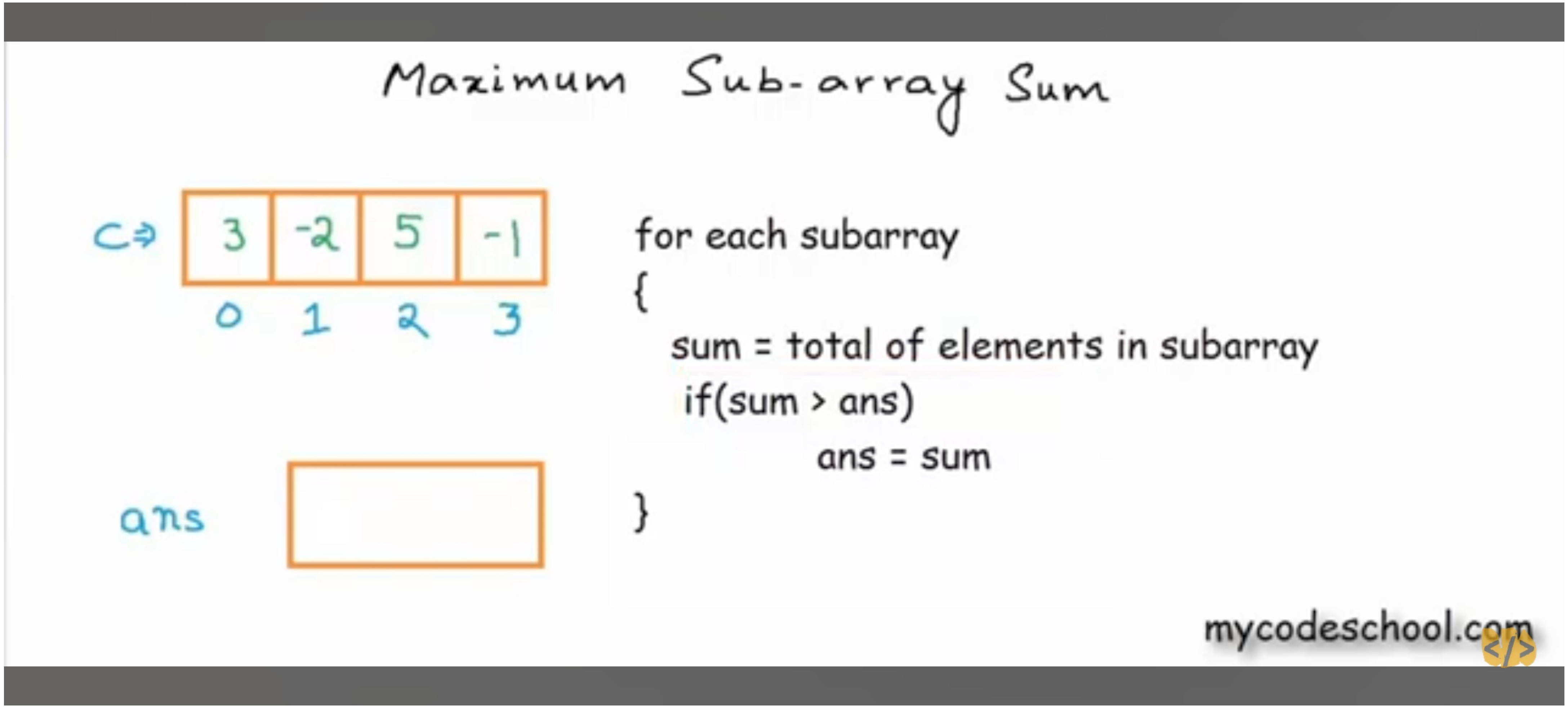

Maximum Sub-array Sum

	0	1	2	3
C ⇒	3	-2	5	-1

ans $\boxed{}$

```
for each subarray
{
   sum = total of elements in subarray
    if(sum > ans)
           ans = sum
}
```

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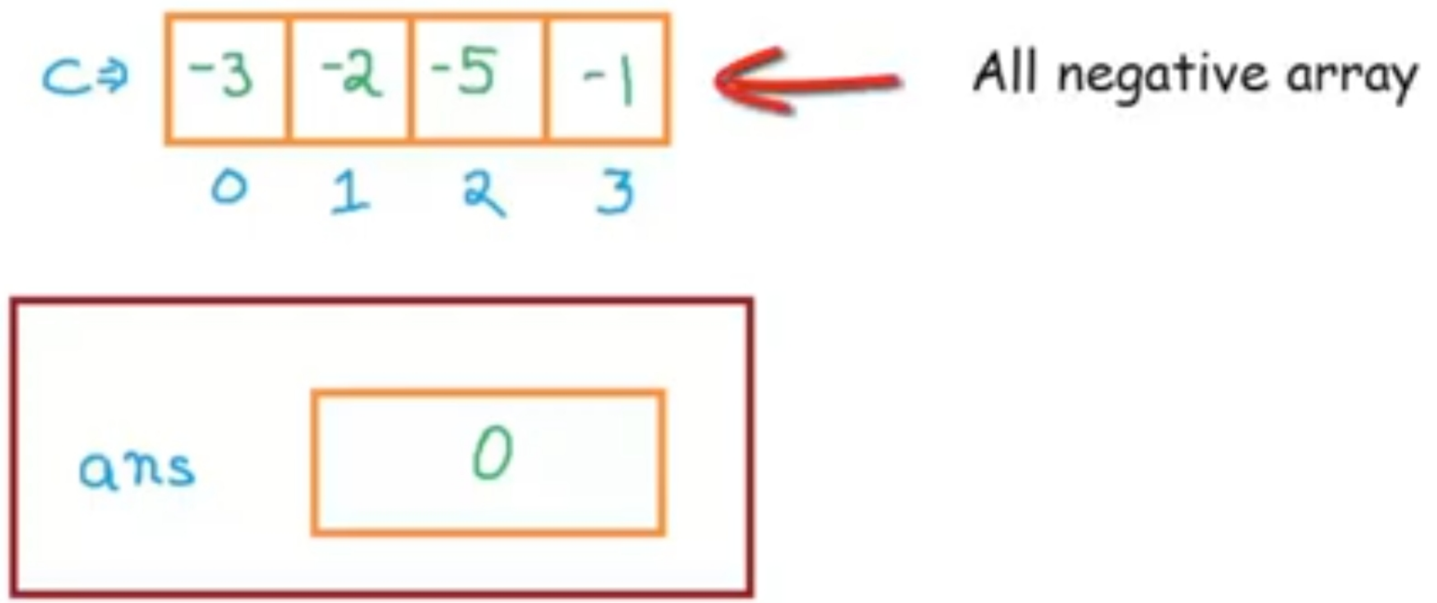
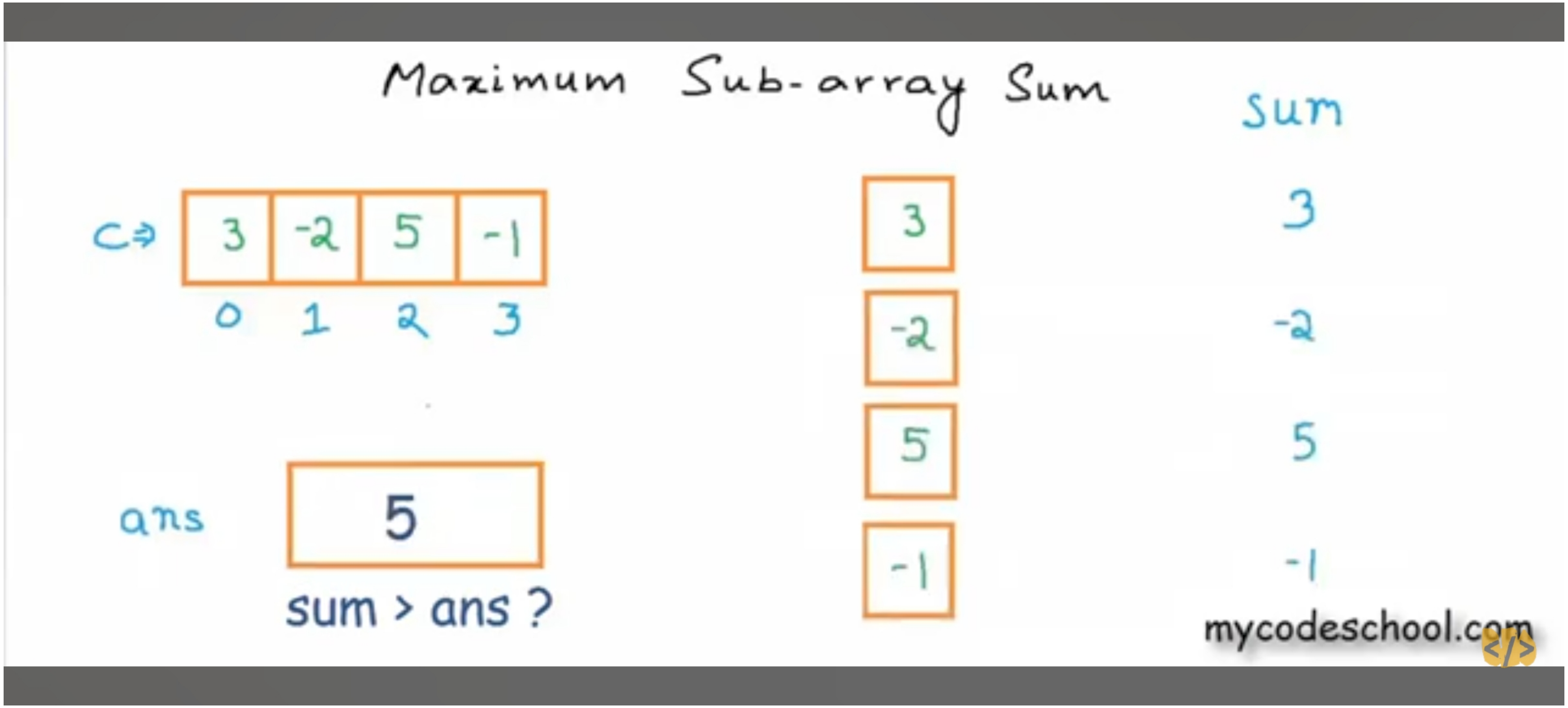
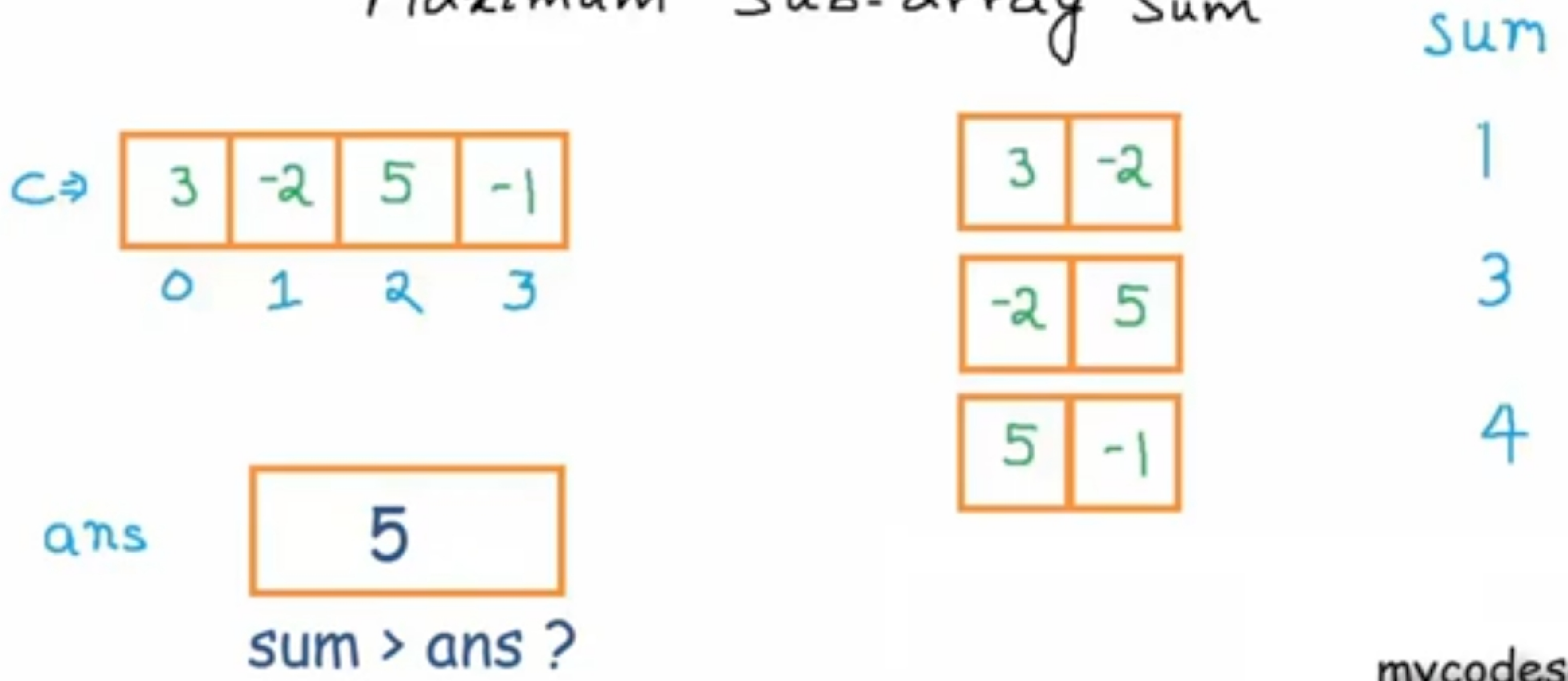
Maximum Sub-array Sum

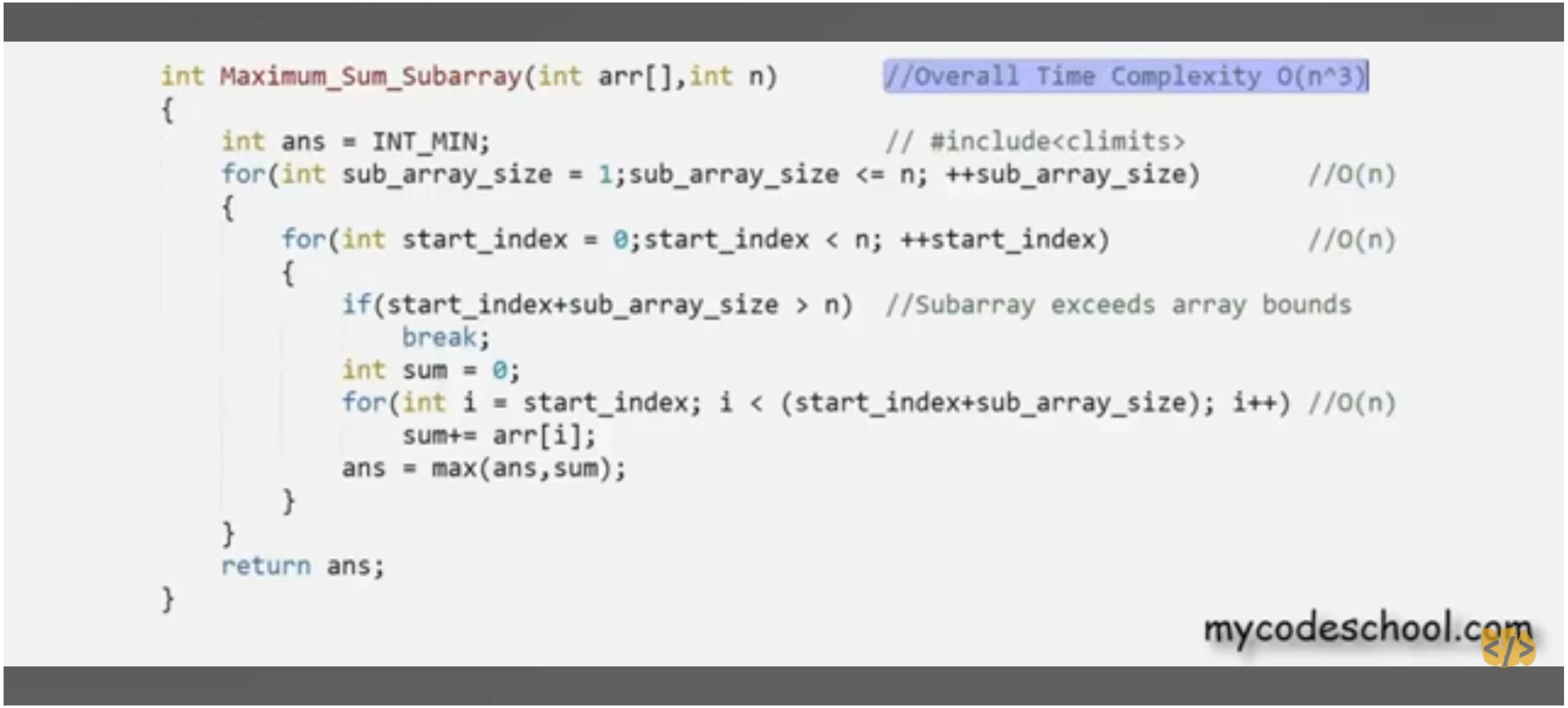




Maximum Sub-array Sum

Maximum Sub-array Sum





```
int Maximum_Sum_Subarray(int arr[],int n)        //Overall Time Complexity O(n^3)
{
    int ans = INT_MIN;                           // #include<climits>
    for(int sub_array_size = 1;sub_array_size <= n; ++sub_array_size)       //O(n)
    {
        for(int start_index = 0;start_index < n; ++start_index)            //O(n)
        {
            if(start_index+sub_array_size > n)  //Subarray exceeds array bounds
                break;
            int sum = 0;
            for(int i = start_index; i < (start_index+sub_array_size); i++) //O(n)
                sum+= arr[i];
            ans = max(ans,sum);
        }
    }
    return ans;
}
```

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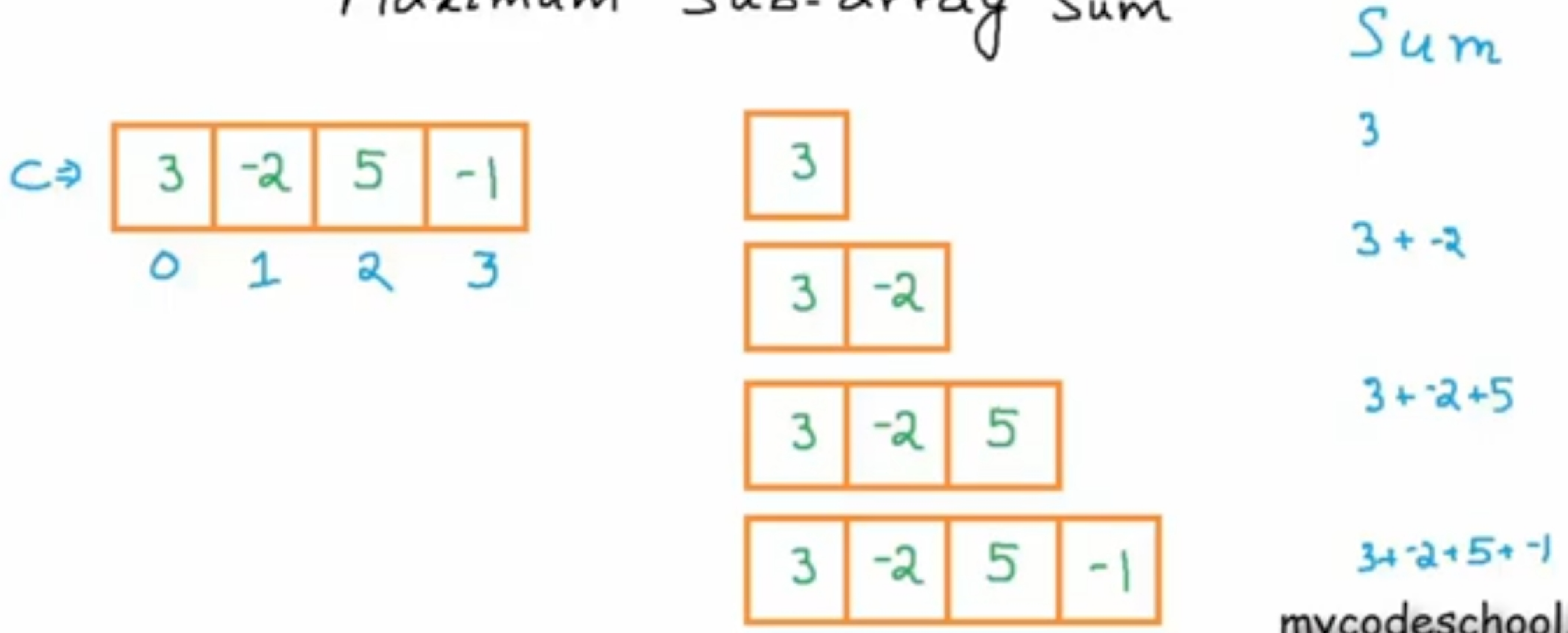
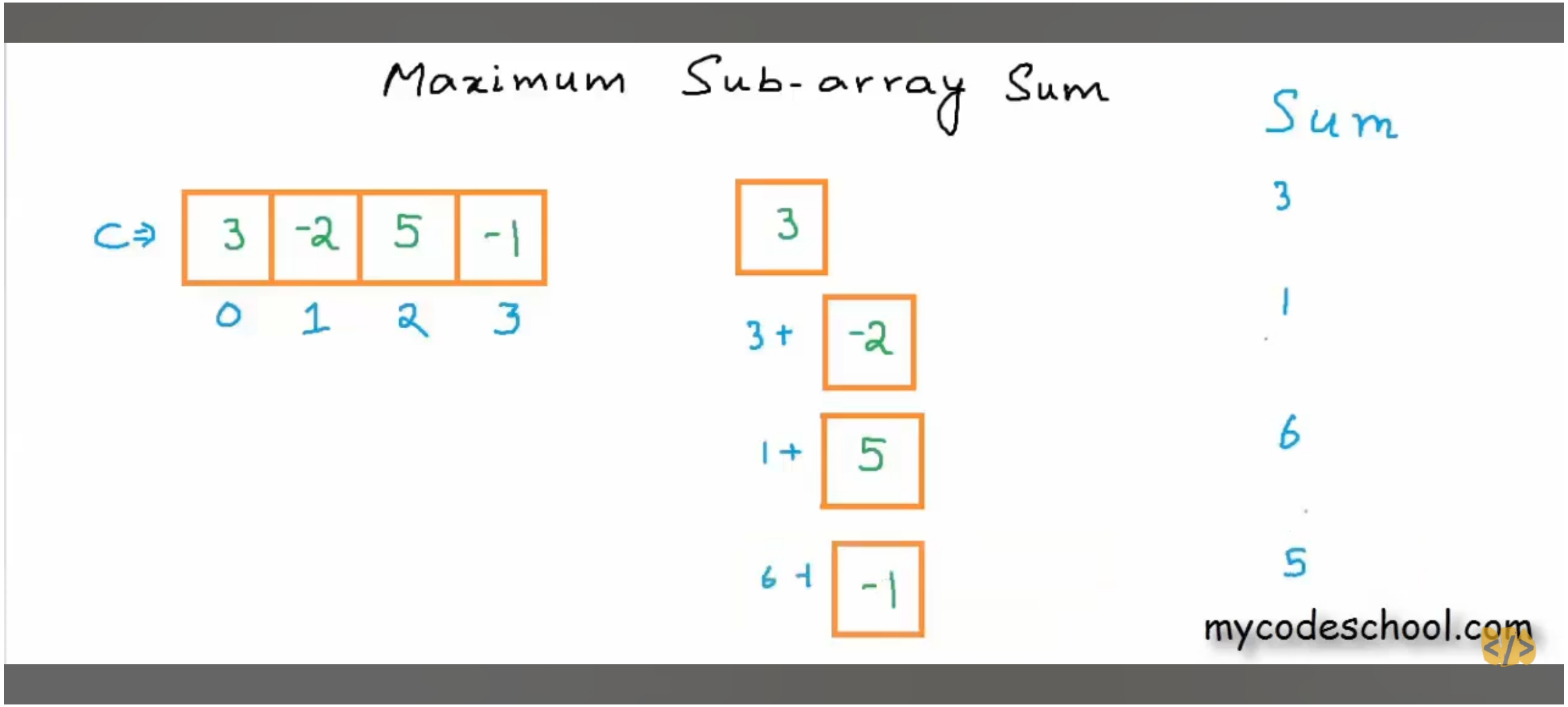
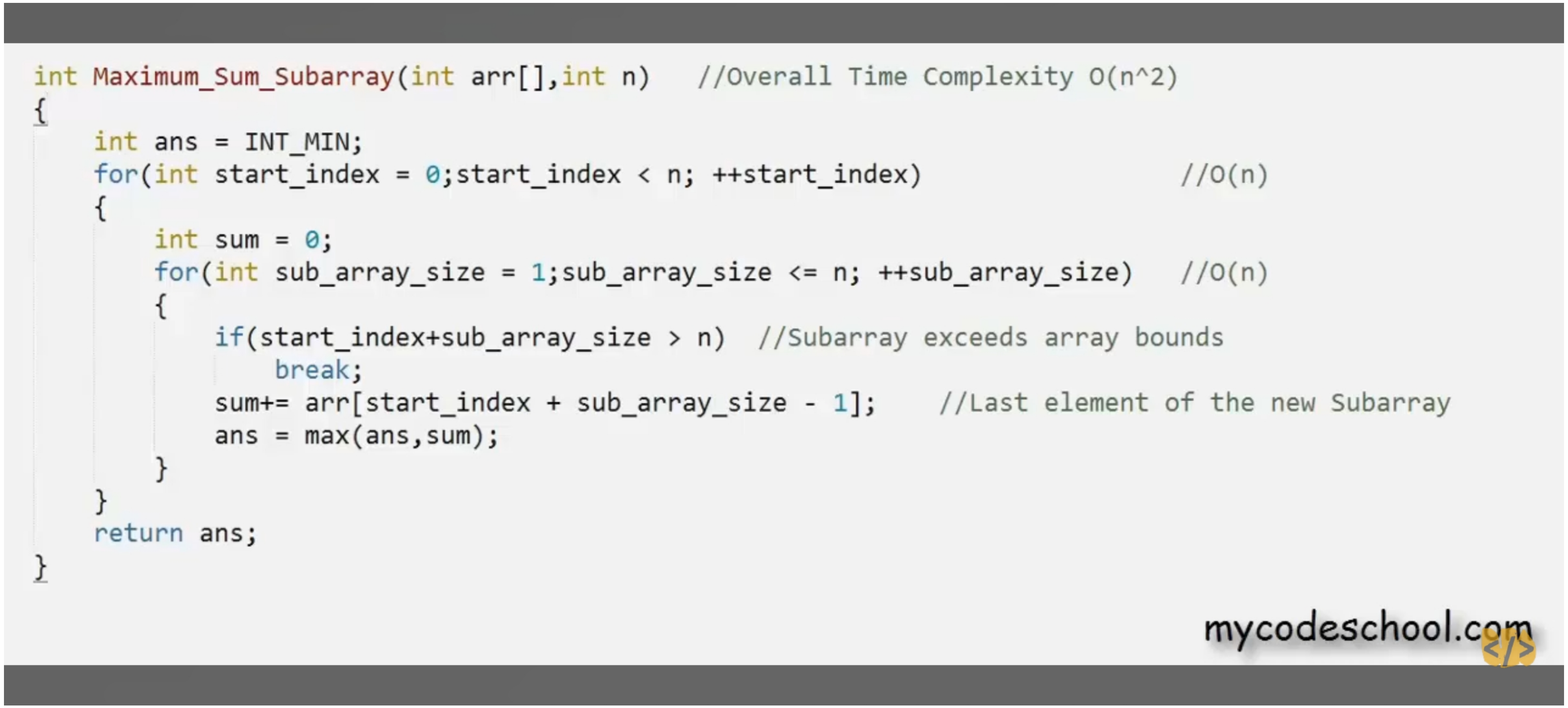
Maximum Sub-array Sum





Maximum Sub-array Sum



```
int Maximum_Sum_Subarray(int arr[],int n)   //Overall Time Complexity O(n^2)
{
    int ans = INT_MIN;
    for(int start_index = 0;start_index < n; ++start_index)                 //O(n)
    {
        int sum = 0;
        for(int sub_array_size = 1;sub_array_size <= n; ++sub_array_size)   //O(n)
        {
            if(start_index+sub_array_size > n)  //Subarray exceeds array bounds
                break;
            sum+= arr[start_index + sub_array_size - 1];    //Last element of the new Subarray
            ans = max(ans,sum);
        }
    }
    return ans;
}
```

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