



Solution Review: Maximum Sum Sublist

This review discusses the solution of the Maximum Sublist Sum Challenge in detail.

We'll cover the following



- Solution (Kadane's Algorithm)
 - Runtime complexity
 - Space complexity

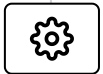
Solution (Kadane's Algorithm)#

This algorithm takes a **dynamic programming** approach to solve the maximum sublist sum problem. Let's have a look at the algorithm.

```
1 def find_max_sum_sublist(lst):
2     if (len(lst) < 1):
3         return 0;
4
5     curr_max = lst[0];
6     global_max = lst[0];
7     length_array = len(lst);
8     for i in range(1, length_array):
9         if curr_max < 0:
10            curr_max = lst[i]
11        else:
12            curr_max += lst[i]
13        if global_max < curr_max:
14            global_max = curr_max
15
16    return global_max;
```



```
16     return global_max\n17\n18\n19 lst = [-4, 2, -5, 1, 2, 3, 6, -5, 1];\n20 print("Sum of largest subarray: ", find_max_sum_sublist(lst));
```



The basic idea of **Kadane's algorithm** is to scan the entire list and at each position find the maximum sum of the sublist ending there. This is achieved by keeping a **current_max** for the current list index and a **global_max**. The algorithm is as follows:

```
current_max = A[0]\nglobal_max = A[0]\nfor i = 1 -> size of A\n    if current_max is less than 0\n        then current_max = A[i]\n    otherwise\n        current_max = current_max + A[i]\n    if global_max is less than current_max\n        then global_max = current_max
```

The solution above only finds the **maximum contiguous sum** in the list; however, it can easily be modified to track the starting and ending indexes of this sublist.

Runtime complexity#

The runtime complexity of this solution is *linear*, $O(n)$.

Space complexity#



The memory complexity of this solution is *constant*, $O(1)$.



Let's run through an example to understand how it works. Initially, the `current_max` and `global_max` are both set to the value at `A[0]`, that is, `-4`:

Initial state

-4	2	-5	1	2	3	6	-5	1
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`current_max = -4`

`global_max = -4`

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