FIT2004: Lab week 03 Solution

Question 3:

Description: Let A[...] be an array of N numbers, and w is a window size. To smooth a value at index i, we have to add w/2 number of elements from indexes before A[i] and w/2 numbers of elements from indexes after it. At first, we will compute the sum of a window for A[0] by adding element at A[0] w/2 times to the sum to handle the left extension of window w. Once the sum and smoothed value for A[0] is computed, for the next elements, we can simply slide the window by one position by subtracting the element at index $i - k - 1$ (i.e. the first element in current window) from sum and by adding the element at index $i + k$ (i.e. the element next to the window) to the sum. The pseudo-code is given below.

Input : Array $A[]$ of n elements, Window size w,
Output: Smoothed $A[]$

```
1  sum =0, k = math.floor(w/2);
2  Initialize an array of size n named smoothed[];
3  for i = 0 to n do
4      if i = 0 then
5          sum = sum + A[0]*k;
6          for x in range (0 to k) do
7              sum = sum + A[x];
8          end
9          Append sum in Smoothed[];
10     else
11         sub = index-k-1;
12         add = index+k;
13         if sub ≤ 0 then
14             sub = 0;
15         end
16         if add ≥ A[].length then
17             add = A[].length-1;
18         end
19         sum = sum - A[sub] + A[add];
20         Append sum in Smoothed[];
21     end
22 end
23 return Smoothed[]
```
