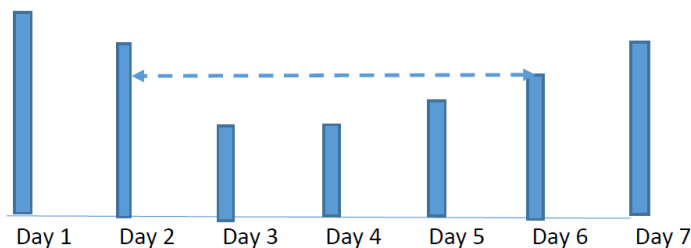# MA 251   Data Structures
Laboratory Assignment 3
21-08-2019
Note: Upload your programs to the server (deadline: 4:30 pm).

1. Stack implementation: Implement a stack S using arrays only, with the following functionality
   - push(int item);
   - int pop();
   - int top();
   - boolean is_empty();
   - boolean is_full();

2. Time series: The temperature span of a day is defined as the previous consecutive number of days, where the temperature of the days, is less than or equal to the temperature of that day. For example, in the figure given below, the span of day 6 is 4, since the temperature of the previous three days is less than that of day 6. Similarly the span of day 5 is 3.

Considering the temperatures are given in array T[1..n], compute the span of a day. Your program should use the stack implementation in Q1. You can use the pseudo-code given below or write your own code.

```
***********   Pseudo code ***************
FOR i  = 1 to n
        WHILE !(is_empty() or done)
                IF T[i] ≥ T[top()]
                        pop()
        ELSE
                done = TRUE
        IF  (is_empty())
                span=0
        ELSE
                span=top()
        s[i]=i-span // Array s[..] stores the span of each day
                push(i)
RETURN s
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```
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