**CS311 DSA Project 1**

**Your Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Univ. ID: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Instructions**

* Demo deadline: lab class today, Submission deadline: check **due date** on course webpage
* Remember to comment your code
* Remember to take screenshots of the running results
* Zero mark will be given if your program does not compile, or gets into an infinite loop (does not terminate)
* Submission guide
	+ Create a new folder named with CS311\_Proj1\_yourID
	+ Archive your code files and this .doc file into **CS311\_Proj1\_yourID.zip (or .rar)**
	+ Submit **the archived file** to cs\_scu@foxmail.com

**Problems (Peak Finding)**

**Definition**: (One-dimensional Peak)

Let $A=a\_{0},a\_{1},…,a\_{n-1}$ be an array of integers of length $n$, integer $a\_{i}$ is a ***peak*** if adjacent integers are not large than $a\_{i}$.

*Example*: $a\_{4}$ is a peak.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| $$a\_{0}$$ | $$a\_{1}$$ | $$a\_{2}$$ | $$a\_{3}$$ | $$a\_{4}$$ | $$a\_{5}$$ | $$a\_{6}$$ | $$a\_{7}$$ | $$a\_{8}$$ | $$a\_{9}$$ |
| 4 | 3 | 9 | 10 | **14** | 8 | 7 | 2 | 5 | 6 |

**Task**: Write algorithm with the following properties:

* Input: An integer array of length $n$
* Output: Any position $0\leq i\leq n-1$ such that $a\_{i}$ is a peak (might be more than one peak)

***Remarks***: 1. You need to consider at least THREE different $n$, that is, at least three test examples.

2. The used data structures MUST include at least one of the list, stack, or queue.

**PROJECT REPORT**

**Inputs** (including screenshots)

 Command: Input $n$ first, then input a set of integers with the length $n$.

**Outputs** (including screenshots)