1 Overview

In this assignment, students will develop and implement a program that allows the user to determine both the winner and winning distance of a long jump competition; in addition, the program will also compute the average distance of all of the jumps.

The primary objective of this assignment is for students to demonstrate use of the various kinds of control structures, and to learn a new algorithm (finding the maximum of a series of numbers).

2 The Program

The program begins by having the user enter the number of participants. Then, the user enters, for each jumper:

- the jumper’s number (for identification purposes); and
- the distance jumped.

The program then displays the following three pieces of information:

1. the number of the winner;
2. the distance jumped by the winner; and
3. the average distance jumped by all jumpers.

Ties do not have to be considered. But the program must cater to the possibility that the user enters 0 when queried as to the number of jumpers.
3 Finding the Maximum of a Series of Numbers

Many elements of this program are similar to the programs that we have covered in class. But students must figure out to determine the winner of the competition. The strategy that should be used is described below\(^1\).

Imagine that there is a leader board located next to the long jump area. The leader board always contains the number and distance of the “current leader” (the competitor who has jumped the farthest of all those who have jumped so far). After each jump, the distance jumped is compared with the distance of the current leader. *If* the distance jumped by the last participant is greater than the distance listed on the leader board, he/she become the new current leader; some track and field official will now replace the number and distance of the old leader with the number and distance of the new one. After every competitor has made his/her jump, the leader board will contain the number and distance of the winner.

4 Sample Output

User input is shown in gray.

**How many jumpers? 5**

**Enter jumper number: 25**
Enter the distance jumped by jumper number 25: 8.31

**Enter jumper number: 46**
Enter the distance jumped by jumper number 46: 8.03

**Enter jumper number: 17**
Enter the distance jumped by jumper number 17: 8.45

**Enter jumper number: 91**
Enter the distance jumped by jumper number 91: 8.53

**Enter jumper number: 76**
Enter the distance jumped by jumper number 76: 8.39

_Jumper number 91 is the winner!_
The winning distance was 8.53
The average distance jumped was 8.342

\(^1\)To those students in this class who know about arrays: you do not need, and can not use arrays in this program!