INTERNSHIP PROGRAM

2023 01

Challenge 01
Computer Science

Challenge 01 – Computer Science

Objectives

- Put into practice the knowledge acquired in the Internship Training sessions
- Strengthen problem-solving and development skills

Challenge Details

Endava has always been known for throwing epic parties and the next one will not be the exception. For the next event a series of challenges are planned for all the guests, and there is a big surprise, the dance floor will look like a square matrix! For this reason, PDR has designed a very interesting game called **Longest Endavans Line Dance** which consists of the following rules

1. There can only be one Endavan for each position on the dance floor.
2. In this game, the ages of the Endavans are important, so PDR has designed a banner with this information, and this must be carried all the time. As shown in the Figure 1.

Figure 1: Endavan Holding The Banner Designed By PDR

The Figure 2 shows an image of what the dance floor will look like from a camera above, where a member of PDR will be checking that everyone is always following the rules and will verify who the winners will be.

27	25	22	23	21
23	24	21	24	24
21	25	26	27	28
23	24	25	28	29
23	22	22	27	26

Figure 2: Dance Floor Seen From Above

3. The winners of the game will be those who manage to create the **longest line dance**, considering the following rules defined by PDR

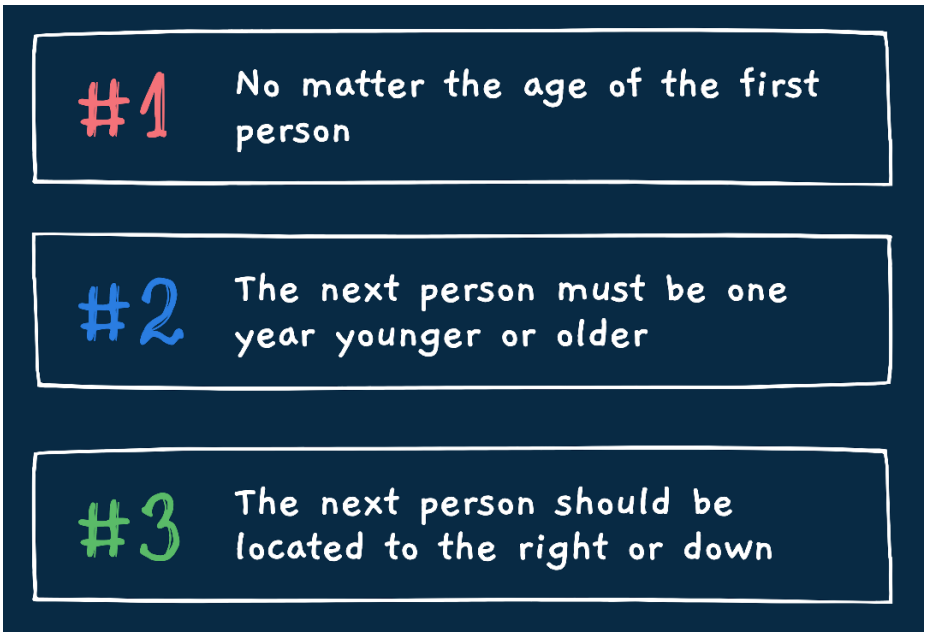

Figure 3: Rules Defined By PDR

For example, if we analyze the dance floor shown in the Figure 2 we would find that the longest line dance is path 25 - 24 - 25 - 26 - 27 - 28 - 27 - 26 with a length of 8 Endavans.

Figure 4: Longest Dance Floor

While there may be different routes with the same longest line dance, PDR is only interested in knowing one that maximizes the number of people. For example, the path 25 - 24 - 25 - 26 - 27 - 28 - 27 - 26 is also valid.

However, the PDR team fears that it may get it wrong at some point and knows that given the large number of Endavans this process may be difficult to validate manually. For this reason, they have given this task to the interns of the Development and Testing disciplines, because they know that they have been learning about Computer Science related topics and additionally have all the necessary skills to develop a program that can perform validation quickly and accurately.

Deliverables

- A console application in the programming language of your choice, that takes the following into consideration
    - **Input:** read an external file with the dance floor dimensions and ages data (It will be provided to you)
    - **Output:**

      Longest Endavans Line Dance is: [Path]
      Length of Path is: [LengthOfPath]
- Create a Git repository to track your progress. **You must send the repository link before Monday, February 6 at 5:00 pm**
- A presentation in **English**, explaining the time and space complexity of your algorithm and describing your development process. **Below, you can see the duration of the demo according to your discipline**

Discipline	Duration in Minutes
Development	15
Testing	10

Bonus

- Implement your solution and an optimal solution to this problem (consider time and space complexity)

Challenge Review

The challenge will be evaluated by a group of judges considering the following points

Item to Review	Score
Quality of Implementation	30
Output Correctness	25
Git Repository	15
Presentation	30
Optimal solution	20
Additional Comments	
This table shows the maximum obtainable grade per item. The maximum possible score is 100/100. Optimal solution item corresponds to the Bonus category and will be added to the total score up to a maximum total score of 100/100.	

Contacts

If you have any questions, do not hesitate to contact us

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