Business Case.

October 2024

incode

incode

Context.

Power a world of trust

Our Company

Incode is the **leading provider of world-class identity solutions** that is reinventing the way humans authenticate and verify their identities online to power a world of digital trust.

Through our revolutionary identity solutions, we are unleashing the business potential of universal industries including finance, government, retail, hospitality, gaming and more, by reducing fraud and transforming human interactions with data, products, and services.

We're in the process of scaling our diverse global team and we're looking for entrepreneurial individuals and leaders who are curious, driven, and excited by ownership to join a Unicorn-status scale-up!

incode

Junior Solutions Engineer.

Power a world of trust

Background:

At Incode, our Solution Engineers require a degree of development skills and are often required to troubleshoot and debug client issues with our API and SDKS and to modify the solution to their needs.

This assessment is to showcase how you can solve the problem and come up with a solution.

We want to see how you would interpret the below case!

Tower of Hanoi

History

The tower of Hanoi is a mathematical puzzle. It consists of three rods and several disks of different diameters, which can slide onto any rod. The puzzle starts with the disks stacked on one rod in order of decreasing size, the smallest at the top, thus approximating a canonical shape. The objective of the puzzle is to move the entire stack to the last rod.

Rules

There are three simple rules:

1. Only one disk may be moved at a time.
2. Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack or an empty rod.
3. No disk may be placed on top of a disk that is smaller than it.

With 3 disks, the puzzle can be solved in 7 moves. The minimal number of moves required to solve a Tower of Hanoi puzzle is $2n - 1$, where n is the number of disks.

Tower of Hanoi

Problem Statement
Move all the disks stacked on the first tower over the last tower using a helper tower in the Middle.

Solution
Develop an application that solves the Hanoi Towers Puzzle, the application must have the following characteristics:

- The App must be implemented considering a Back-End service for algorithm/calculations execution, and a Front-End Application that shows the movements required to resolve it based on a specific number of disks.
- The Back-End service should be services/microservices that use JSON payloads.
- The Front-End could be a Web Application that will consume the Back End Service/API and must show the required movements to solve the Puzzle.

For example:

- Take disk 1 from rod A to rod C
- Take disk 2 from rod A to rod B
- Take disk 1 from rod C to rod B
- Take disk 3 from rod A to rod C

Tower of Hanoi

- Extra Bonus (Optional). Bonus if the code is available in a GitHub repository to access it.

- Extra Bonus (Optional). For the Front-End, add graphically (UI components) how the Hanoi Towers puzzle is solved. Consider adding an input to select the number of disks on your GUI.

incode

Evaluation Criteria.

Power a world of trust

Case Presentation

- It is essential to consider the following for your case presentation (Slide Deck Document).

  - Brief description of the chosen algorithm.
  - Explanation of the Application Architecture Diagram.
  - Explanation of the Tech Stack used to implement the application.
  - Live Demo and Debugging of your code implementation.
  - Solving times for 5, 10, 20, 50 disks.

incode