TECH-LEAD CHALLENGE

Context:

- Saudi Real-estate businesses traditionally prefer auctions as a buy & sell method.
- Online platforms are growing due to the digitization movement and government support.
- Approval required from Infath, a Saudi government arm responsible for approving online auction platforms.
- Seven companies officially approved by Infath are our direct competition.
- Our client is a conglomerate with core businesses in real-estate, construction and financial services. They would like to compete in the online auction marketplace space.

Incumbents:

Objective: Create a concept for a new bidding platform that stands out in the competitive landscape currently dominated by platforms like Soumtech and Saudi Auctions.

1. Microservices Architecture Strategy:

- Given a real-time bidding platform with high traffic, how would you architect a microservices system to handle different components such as user authentication, bidding logic, and notifications?
- Elaborate on your service discovery and registry plan to maintain communication between microservices.

2. System Scaling and Load Balancing

- The platform is hitting peak traffic during a high-profile auction. Outline your immediate actions to scale the system and balance the load without downtime.

Discuss your choice of technologies and methods, referencing specific AWS services and load balancing strategies.

3. Code Review & Refactoring Task

- You are provided with a GitHub repository link to a Laravel service that handles bid transactions. Your task is to identify inefficiencies and security flaws in the code and refactor it. Detail the changes you would make and why, and how you would test the refactored code.

4. Leadership in Upgrade Transition

- You need to lead your team through a Laravel version upgrade that introduces breaking changes. Provide a step-by-step guide on how you would approach the upgrade, including risk assessment, team briefings, and deployment strategy, ensuring minimal disruption to live services.
- How exactly do you ensure that your team is
  - Up to date with the latest knowledge and technologies.
  - Incentivized and eager to come to work every day with a positive attitude.

    Please write your answers in concrete steps/logic.

5. Innovation Under Competitive Pressure

- If the Auctions are run in Hybrid Justify its feasibility and alignment with the platform's objectives.

6. Coding Challenge:

- Implement an API endpoint in Laravel that authenticates users and handles real-time bidding data securely. Write a brief that includes endpoint specifications, data validation steps, and security measures. Feel free to provide a link to your code repository.

6. AI/ML Feature Integration:

- Envision an AI-based recommendation system that suggests auction items to users based on their past behavior. Describe the data pipeline and machine learning models you would consider.

7. Conflict Resolution in Architectural Decisions:

- Present a scenario where there's a division in the team over the choice of a specific technology for a component of the system.
- Detail your conflict resolution approach, taking into account the technical merits and the team's concerns, leading to a consensus-driven decision.

Submission Guidelines:

- Document your approach to each scenario in no more than two pages. Be clear, concise, and specific in your technical explanations.
- For the coding challenge, feel free to provide a public repository link with your code, accompanied by a README that summarizes your approach.
- Allocate no more than one hour to complete this challenge to simulate working under time constraints.