



Presents -

# HACKATHON - DevOps

"Case Study"

"Astarion's Garage"

*26th - 27th April, 2024*



## Case Study:

For an upcoming Car Festival, Astarion had a brilliant idea of a platform to connect people around the country who will post pictures of their cars up for sale to potential clients. Given how brilliant the idea is, he sat down to chalk the idea and how he wanted to design the platform.

### Development Phase

After finalizing the design he sent out leaflets to his surroundings to determine the response from the consumer. To his surprise he received an overwhelming response from about 10000 sellers and buyers who have already shown interest to use the platform. Though the response was positive, the platform, however, is not yet developed ahead of the festival and needs substantial planning to support its many consumers. Astarion has reached out to you to design a platform for using the best in class practices in the devops field. Fortunately you are a cool engineer and may help Astarion to solve the challenges he will face in developing the solution in the shortest time avoiding technical debts, development silos and can add more features to be integrated to the solution in the future without creating a magnificent raging dumpster fire!

### Deployment Phase

Astarion is not a tech savvy guy but he has a number of queries and questions that you need to address. Our garage owner is concerned about how the application will handle and distribute requests efficiently when all the users simultaneously use his platform as the user base grows. He wants his platform to be able to scale to cater the increasing demand of the user.

Though in a happy path application will run smoothly, Astarion wants insights on how the application is performing and resources he is using, he prefers some kind of graph that will provide both the infrastructure and application resource usage and be alerted during disasters or when the application is being overloaded.

Astarion, being a visionary, plans to roll out new features and updates such as category or price wise sorting, real-time inventory updates, and multiple payment options. As you introduce new features, automate integration and testing processes to ensure compatibility and functionality. You may need different deployment environments for developing and testing. Therefore Astarion wants an efficient and optimized way of building and deploying the applications and wants to rollout with as minimal downtime as possible so as to not hamper the user experience. Additionally, Astarion also needs to get updated when he is getting a lot of orders. He may also want to determine which type of cars people are ordering more frequently.

Another thing to mention, you need to be careful about security issues of the application. For example, application layer security, database security, network level security etc. Given the popularity of his idea the applications such as the frontend may be susceptible to malicious activity, so security is also a concern for Astarion such as data encryption through certificates. Given the volume of the users and application data such as pictures of cars, Astarion want the data to be stored securely and efficiently using best practices that are used for storing images.

Astarion's dream doesn't end there, he wants to go big and extend his business Internationally. Implement different Database strategies for people of different location to access the data in an efficient manner. (Caching, read/write databases location-wise etc..)~

Participants can help "Astarion's Garage" business by following any of the following approaches with no particular order:

- Develop the platform and necessary features to implement it
- Containerization of the application
- Implement CI/CD pipeline and automate the deployment process as much as possible. Testing for CI.
- Service SLAs, availability and scalability by adopting distributed systems architecture
- Infrastructure, data and network security of the platform
- Create business critical insights and metrics from application
- Monitoring, observability, traceability, alerting and fault detection ensuring a quick feedback loop
- Backups of Critical components

#### **General Instructions:**

- At this point of the competition, create and use a github repository and submit it at the end of the competition
- Using the factors and considerations indicated in the challenge description, design the solution on the hackathon day
- Number of features of the application developed from the challenge description or any other features will carry a bonus point. However, it is advised to design a complete solution (*any code/solution developed in advance will not be acceptable*).
- **Any code used that is made available to the public must have the source cited.**
- Submit a solution including all the documentation, code and diagrams at the github repository

*Any unfair attempts, misconduct, or violation of terms may result in elimination. The organizers maintain the right to make final decisions. Participants will be notified if the present regulations are significantly modified. In any scenario, IUT Authority reserves all rights.*