A brief report on the seminar on System Design

Aiming to introduce students at the undergraduate level to System Design and help them get started on their journey of interview preparation, a seminar was conducted by three accomplished final year Computer Science students on the 8th of December 2020. A total of 40 participants attended this very fruitful virtual seminar. Kanishq, one of the three resource persons, started off the presentation with a simple and easy to understand introduction to System Design and why it is important to think about system scalability in the real world. He went on to explain why system design is important by saying that good developers and engineers are those who critically analyze the problem beforehand to save time and resources. He also talked about a few different terminologies like scalability, reliability, availability, and efficiency and highlighted the importance of these terms through real life examples. He also talked about a few more basic components like the different types of architecture, polling, web sockets, and proxies before handing over the presentation to the second speaker of the seminar, Kanandavel, who continued with the next component - Load Balancer.

He gave a brief introduction about it and pinpointed the benefits of using one. He also gave an idea on how to implement them using Load balancer algorithms. He then went on to explain the use cases of cache and touched on important topics related to it like cache validation and cache eviction policies before diving into Databases. He then gave a well-rounded explanation about the different types of databases- SQL and NoSQL and gave the audience tips on how to choose the best database for their projects. Lastly, he talked about the concept of indexing and its use.

He then handed over to Kanishq who talked about the CAP theorem which expands for Consistency, Availability, Partition Tolerance, and also gave a real-world example for better understanding.

The third speaker for the evening, Mohansundar, presented the most awaited section of the seminar in which he walked the audience through an interviewer's favorite design problem - Design a URL shortening service like Tiny URL. He explained how to draft the functional and non-functional requirements, analyze the traffic, estimate the storage and cost, and brought in all the basic components that were discussed by the other speakers to come up with a design solution.

The session concluded with Kanandavel giving the audience tips on how to tackle new design problems and he also highly encouraged them to ask the interviewers questions regarding the requirements. Overall, it was a very rewarding seminar, and the audience left with a clear cut idea on how to prepare for the System Design interview round.

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