Veronica Guzman

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CS 470 Final Reflection

8-1 Assignment

https://www.youtube.com/watch?v=fNrljyiDPGk&t=1s

Final Reflection

Throughout CS 470, I have gained valuable skills that enhance my capabilities as a full stack developer. This course has helped bridge the gap between theoretical knowledge and practical implementation of cloud-based applications, positioning me as a strong candidate for future roles in software development. I have acquired skills in cloud computing and deployment, gaining experience in deploying full stack applications on cloud platforms and understanding key services such as AWS, Azure, and Google Cloud. I have also developed expertise in API development and integration by designing and implementing RESTful APIs, ensuring efficient data flow between frontend and backend services. Additionally, I have learned how to break monolithic applications into microservices, improving scalability and maintainability, and explored serverless frameworks like AWS Lambda to optimize performance and cost. My knowledge of continuous integration/continuous deployment (CI/CD) has enabled me to automate development, testing, and deployment processes, while my understanding of security best practices has helped me implement authentication, authorization, and secure data handling measures.

I have developed strong problem-solving skills and adaptability, allowing me to handle complex software challenges effectively. My ability to work with both frontend and backend technologies, combined with cloud deployment knowledge, makes me well-suited for full stack development roles. Additionally, I excel at writing clean, efficient, and scalable code, collaborating in agile development environments, and applying DevOps principles to enhance software lifecycle management. As a result, I am prepared for roles such as Full Stack Developer, Cloud Engineer, Software Engineer, DevOps Engineer, and Backend Developer, where I can contribute to building and maintaining scalable web applications, deploying and managing cloud-based solutions, designing robust software systems, automating deployment and infrastructure management, and optimizing API-driven services.

As I look ahead to the future of my web application, scalability, cost-efficiency, and performance optimization will be key factors in ensuring sustainable growth. Cloud services offer numerous ways to achieve these goals through microservices and serverless computing. To handle scaling and error handling, I plan to implement auto-scaling groups for microservices, ensure load balancing, and integrate serverless functions to manage peak traffic demands. Cost prediction will be facilitated through monitoring tools such as AWS Cost Explorer and Azure Pricing Calculator, which will help forecast expenses based on usage patterns. When comparing the cost predictability of containers versus serverless, containers, such as those managed by Docker and Kubernetes, provide more predictable costs as they run on fixed cloud instances, while serverless follows a pay-as-you-go model that reduces cost for sporadic workloads but may be harder to predict with high traffic fluctuations.

In evaluating expansion strategies, microservices offer high scalability, fault isolation, and independent deployments but require complex orchestration and strong API management.

On the other hand, serverless computing is cost-efficient, requires no server management, and provides auto-scaling capabilities but may introduce cold start latency, limited execution time, and unpredictable costs. Elasticity ensures that the application can handle varying loads without manual intervention, automatically provisioning resources as needed. The pay-for-service model allows cost optimization, ensuring that resources are used efficiently. These factors play a crucial role in decision-making for expansion, helping to balance performance with cost-effectiveness.

By leveraging microservices and serverless technologies, I can ensure that my web application remains scalable and cost-efficient. This course has provided me with a solid foundation in cloud computing, API development, and deployment strategies, preparing me to take on complex development roles with confidence. My GitHub portfolio, along with this reflection, will serve as a testament to my growth and readiness for future opportunities.