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**CS470 Final Reflection**

<https://youtu.be/2MygJdkqz2E>

This course has been instrumental in helping me move closer to my professional goals as a software developer. It has provided me with hands-on experience in cloud computing, microservices, and serverless architecture, which are critical components of modern software development. By exploring these technologies, I am now better equipped to work in roles that require the design and deployment of scalable, efficient, and cost-effective web applications.

One of the key skills I have developed during this course is proficiency in managing cloud-based infrastructure. I have learned how to deploy and manage applications using AWS, which enhances my marketability in an extremely competitive job market. Additionally, I have gained knowledge about containerization with Docker, enabling me to create isolated, portable environments that simplify deployment across different systems.

My strengths as a software developer include problem-solving, adaptability, and a solid foundation in secure coding practices. I am comfortable analyzing complex requirements and translating them into efficient code. Moreover, my ability to learn quickly and adopt emerging technologies allows me to thrive in dynamic work environments. I am prepared to assume roles such as software developer, DevOps engineer, or cloud solutions architect, and I plan to venture into machine learning and data science once I’ve completed this degree. I am confident in my ability to contribute to projects involving web application development, cloud service integration, and continuous delivery pipelines.

Throughout this course, I have developed a comprehensive understanding of cloud services and their effects on application scalability and efficiency. Utilizing microservices and serverless architectures presents numerous advantages, including reduced management overhead, enhanced scalability, and improved cost efficiency. To plan for future growth, I would focus on scalability and error handling by implementing auto-scaling policies and robust monitoring tools. For instance, using AWS Lambda for serverless functions would enable the application to automatically scale in response to traffic spikes. Error handling could be addressed through centralized logging systems and the implementation of retries for transient failures. To predict costs, I would analyze historical usage patterns and utilize the cost calculators provided by cloud service providers. Between containers and serverless options, serverless architectures tend to offer greater cost predictability since they charge based on actual usage rather than on allocated resources.

For applications with consistent, high-volume workloads, containers can often be more cost-effective. When deciding between microservices and serverless architectures, several factors should be considered:

* Pros of Microservices:

- Flexibility in development

- Scalability of individual components

- Resilience against system-wide failures

* Cons of Microservices:

- Increased complexity in managing communication and orchestration

* Pros of Serverless:

- Simplified management

- Pay-per-use pricing model

- Seamless scalability

* Cons of Serverless:

- Potential latency issues

- Challenges with debugging due to vendor lock-in

By weighing these pros and cons, you can make a more informed decision about which architecture best fits your application's needs. Elasticity and the pay-for-service model are crucial for making decisions that foster future growth. Elasticity ensures that applications can efficiently handle varying workloads, while the pay-for-service model helps minimize costs by charging only for the resources actually used. These principles guide the selection of cloud architectures that meet both technical requirements and budget constraints. Having gained knowledge and skills from this course, I feel well-prepared to tackle the challenges of designing and deploying scalable web applications in my future career. The focus on cloud services and modern development practices has been invaluable, and I am excited to continue building on this foundation.