



Daffodil International University

Department of Computer Science and Engineering (CSE)
Faculty of Science and Information Technology (FSIT)

Assignment 1

Semester: Spring 2024

Course Code and Title: CSE316 – Software Project III

Course Teacher and Initial: Fahim Faisal (FF)

Section: 61_U, 61_V

Assignment Title: Designing a Scalable Web Application Architecture

Assignment Overview:

In this assignment, you will dive into the world of software architecture by designing a scalable architecture for a web application. Scalability is a crucial aspect of modern web applications, as they need to handle varying loads efficiently while maintaining performance and reliability. You will explore different architectural patterns, technologies, and principles to create a robust and scalable system.

Objectives:

- Understand the importance of software architecture in building scalable web applications.
- Explore various architectural patterns and their suitability for different scalability requirements.
- Design a scalable web application architecture considering factors such as performance, reliability, and maintainability.
- Select appropriate technologies and tools to implement the designed architecture.
- Demonstrate the ability to document and present architectural designs effectively.

Assignment Tasks:

Task 1: Research and Analysis

- Conduct research on scalable web application architectures, including microservices, monolithic, serverless, and others.
- Analyze the scalability requirements for the given web application scenario. Consider factors such as expected user base, traffic patterns, data volume, and future growth projections.

Task 2: Architecture Design

- Based on your research and analysis, design a scalable architecture for the web application, choose an architectural pattern (e.g., microservices, serverless, etc.) that best fits the scalability requirements identified in Task 1.
- Define the components/modules of the architecture, their responsibilities, and how they interact with each other.
- Consider aspects such as load balancing, caching mechanisms, data storage, and communication between components.

Task 3: Technology Selection

- Select appropriate technologies and tools to implement the designed architecture.
- Evaluate different programming languages, frameworks, databases, and cloud services based on their suitability for the architecture.
- Justify your choices considering factors like performance, scalability, ease of development, and community support.

Task 4: Documentation

- Prepare detailed documentation of the designed architecture, including diagrams, descriptions of components, and their interactions.

Deliverables:

- Research report outlining different scalable web application architectures and scalability requirements analysis.
- Your report must include architectural design describing the proposed architecture with diagrams and component descriptions.
- Your report must also include technology selection justification detailing chosen technologies and tools.

Submission Guidelines:

- Submit your report as PDF via BLC.
- Submit printed copy of your report in class.
- Ensure proper referencing for any external sources used in your research.

Evaluation Criteria:

- Depth of research and analysis (20%)
- Clarity and coherence of the architectural design (40%)
- Appropriateness of technology selection (20%)
- Quality of documentation (20%)

Note: Plagiarism will not be tolerated, and any instances of it will result in penalties as per the academic integrity policy.