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CS423 – DevOps
Assignment 4

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This project showcases the development of a robust web application infrastructure on Amazon Web Services (AWS) using Terraform, an infrastructure as code (IaC) tool. It aims to create a scalable, secure, and efficient cloud-based environment suitable for hosting diverse web applications.

The main goal is to establish a comprehensive AWS infrastructure covering networking, security, computing, and identity management. This infrastructure provides a blueprint for deploying web applications with a focus on high availability, security, and scalability.

Key tools and technologies include AWS for cloud services and Terraform for managing cloud resources using declarative configuration files.

The infrastructure components comprise a custom Virtual Private Cloud (VPC) with subnets for isolating network environments, Internet Gateway (IGW) for VPC-internet communication, route tables for traffic rules, security groups for firewall-like control, an IAM user for secure AWS management, EC2 instances (web server and backend), and a key pair for SSH access.

The deployment strategy relies on Terraform to automate resource creation, ensuring reproducibility and version control.

Security is a top priority, with meticulously configured security groups following the principle of least privilege. An IAM user is set up with specific permissions, limiting broader access.

The architecture emphasizes scalability and high availability by utilizing multiple subnets across different Availability Zones, enabling the infrastructure to handle failures and scale according to demand.

In summary, this infrastructure project serves as a model for deploying cloud-based web applications, incorporating best practices in cloud architecture design. Leveraging Terraform enables efficient and repeatable deployments. The resulting environment is secure, reliable, and ready for future expansion to accommodate diverse application requirements.