Cloud Computing Assignment using AWS environment
Semester 2 2024
Group Assignment: 2 members per group assigned by students (self-enrol) on Blackboard
Due date: 4 June 2024
Total mark: 60

Assignment Objective:

This assignment covers the cloud computing technical skills and theoretical knowledge you have learned during the semester. The objective of this project is to deploy a web service and feature on the "AWS Learner Lab" environment by utilizing the available services.

Section 1- Write a Report

In this section, you need to write a report introducing your business (make-up something you like) and its functionality including the following information:
- What is your company's operation?
- Justify your decision to choose the cloud over in-house infrastructure.
- List the cloud services and their functionalities you are implementing.
- Provide a rough cost estimation.

Submit your report via the available link on Blackboard.

(5 marks)

Section 2 – Implementation

Implement your solution as a web service, using the provided laboratory space in the AWS Academy Learner Lab. Please read the course documentation before proceeding with using the lab environment including Student Guide.pdf, and the Readme section available in the "Learner Lab". Also, complete "Learner Lab Activity- CodeWhisperer" for developing a web feature.
Students are given a $100 credit to use the AWS environment. Most tasks are matched with their respective laboratory experiment in "AWS Academy Cloud Foundation".

Task 1- Users' accounts, policies, security credentials, and permissions must be managed centrally in the cloud.
- o Create a group

(5 marks)

Task 2- Create a VPC with a customized network. Run your web server on an EC2 instance.
- o Define a virtual network and specify the subnet address using VPC. Create two availability zones. You must have public and private subnets, an internet gateway, a NAT gateway, and a route table.
- o To implement a virtual firewall, configure a security group to allow HTTP access and apply it to your VPC.
- o Create an EC2 Instance to work as the webserver. You can use the default Amazon Machine Image. Make sure the instance is accessible through an SSH connection. Place the instance in the correct network and apply the security group.

Task 3- Create a web feature in your EC2 instance. You can use the example in CodeWhisperer activity to help you develop your feature.

(10 Marks)

Task 4- Assuming that your company's demand is changing, and you are required to upgrade your resources.
- o Make sure termination Protection is enabled.
- o Upgrade the instance type.
- o Monitor the instance and record the log messages (a screenshot is sufficient).

(5 marks)

Task 5- Expand the storage:
- o Create a new EBS volume and attach it to the EC2 instance.
- o Configure the file system.
- o Take an EBS snapshot as a backup for future deployment or restoration.

(5 marks)

Task 6- To manage data and accounts create a database (DB) using Amazon Relational Database Services (Amazon RDS).
- o Create a MySQL RDS instance. Your web server must be able to access the RDS DB subnet group so a security group must be defined.
- o Make sure the web server can interact with DB.

(10 marks)

Task 7- Add auto-scaling and load balance to your server:
- o Create an AMI from your web server.
- o Create and configure the automated load balancer.

(5 marks)

Task 8- Create and submit a 5-minute video presentation. It's important to consistently record your progress to prevent any loss of work and the need for redoing tasks.

(10 Marks)

Good Luck!