**Amazon Web Services**

**Lesson 1 - 2hrs**

**Content**

-Introduction cloud computing

-AWS account setup

-AWS services overview

**Objective**

Introduction to Cloud Computing:

Understand the concept of cloud computing and its significance in modern technology.

Define the characteristics and benefits of cloud computing.

Explain the different deployment models in cloud computing (public, private, hybrid).

Identify real-world applications and use cases of cloud computing.

AWS Account Setup:

Create an AWS free tire account and understand the registration process.

Navigate the AWS Management Console and become familiar with its features.

Configure account settings and security measures for an AWS account.

Understand the billing and cost management aspects of an AWS account.

AWS Services Overview:

Gain an overview of the major AWS services and their functionalities.

Identify the key categories of AWS services, such as compute, storage, networking, databases, and more.

Understand the purpose and use cases of essential AWS services, including EC2, S3, RDS, Lambda.

By the end of these lessons, students should have a solid understanding of cloud computing, be able to set up their own AWS account, and have a comprehensive overview of the various services offered by AWS. They will be equipped with the knowledge to explore and utilize AWS services effectively for their specific needs.

**Lesson 2 - 2hrs**

**Content**

-Budget & billing

-S3 bucket storage

-Command line interface

-Identity access management

**Objective**

Budget & Billing:

Understand the importance of budgeting and cost management in cloud computing.

Learn how to set up budgets and cost alerts to monitor AWS usage and expenses.

Explore various cost optimization strategies to minimize AWS expenses.

Understand the AWS billing structure and billing options available.

S3 Bucket Storage:

Understand the concept of Amazon Simple Storage Service (S3) and its role in cloud storage.

Learn how to create and configure S3 buckets for storing and managing data.

Explore different storage classes and their respective use cases within S3.

Gain proficiency in uploading, downloading, and managing objects in S3 buckets.

Command Line Interface (CLI):

Familiarize yourself with the AWS Command Line Interface (CLI) and its benefits.

Learn how to install and configure the CLI tool on your local machine.

Explore essential CLI commands for interacting with AWS services and resources.

Gain hands-on experience in using the CLI to perform common administrative tasks in AWS.

Identity Access Management (IAM):

Understand the importance of identity and access management in AWS.

Learn how to create and manage IAM users, groups, and roles.

Explore IAM policies and permissions to control access to AWS resources.

Gain proficiency in implementing security best practices for user authentication and authorization.

Upon completing these lessons, students should have a comprehensive understanding of budgeting and billing practices in AWS, be able to effectively manage and optimize costs. They will also possess the necessary skills to work with S3 bucket storage, utilize the AWS Command Line Interface for managing AWS resources, and implement proper Identity Access Management for secure user management.

**Lesson 3 - 2hrs**

**Content**

-Elastic cloud computing

-Deploy Flask AI App using PuTTY, WinSCP, and Linux Commands

**Objective**

Create Elastic Cloud Computing (EC2) Instance in AWS:

Understand the concept of EC2 instances and their role in AWS.

Learn how to create an EC2 instance in the AWS Management Console.

Configure instance settings, such as instance type, security groups, and key pairs.

Understand different storage options and their implications for EC2 instances.

Deploy Flask AI App using PuTTY, WinSCP, and Linux Commands:

Understand the basics of Flask, a Python web framework, and its use in developing AI applications.

Learn how to install and configure PuTTY and WinSCP to connect to an EC2 instance securely.

Transfer the Flask AI app files from the local machine to the EC2 instance using WinSCP.

Gain proficiency in connecting to the EC2 instance via PuTTY and executing Linux commands for app deployment.

Linux Commands for App Deployment:

Learn essential Linux commands for navigating the file system, installing packages, and managing processes.

Configure the necessary dependencies and environment for the Flask AI app using Linux commands.

Start and manage the Flask server on the EC2 instance using Linux commands.

Verify the successful deployment of the Flask AI app and access it through a web browser.

By the end of these lessons, students should be able to create an EC2 instance in AWS and understand its associated configuration options. They will also be equipped with the knowledge and skills to deploy a Flask AI app on the EC2 instance using PuTTY, WinSCP, and Linux commands. This will enable them to leverage AWS for hosting and deploying web applications effectively.

**Lesson 4 - 2hrs**

**Content**

SageMaker

Notebook instance

Inference tool for ML model

Endpoints using gateway API

Testing app using Postman

**Objective**

Use SageMaker AWS Service to Create Notebook Instance:

Understand the purpose and capabilities of Amazon SageMaker in machine learning workflows.

Learn how to create a notebook instance in Amazon SageMaker.

Configure the necessary settings for the notebook instance, such as instance type and security options.

Access and familiarize yourself with the Jupyter notebook environment within SageMaker.

Use Inference to Develop Machine Learning Model:

Understand the concept of model inference and its role in deploying machine learning models.

Explore different techniques for developing machine learning models using SageMaker.

Learn how to train and deploy a machine learning model in SageMaker for inference purposes.

Evaluate the performance and accuracy of the deployed model using appropriate evaluation metrics.

Create Endpoints Using Gateway API:

Understand the concept of endpoints in AWS SageMaker and their importance in serving machine learning models.

Learn how to create an endpoint in SageMaker to expose the deployed machine learning model.

Configure the necessary settings for the endpoint, such as instance type and scaling options.

Understand the concept of the Gateway API and its role in handling API requests to the endpoint.

Test the App Using Postman:

Understand the importance of testing the deployed machine learning model using API requests.

Learn how to use Postman, a popular API testing tool, to send requests to the endpoint.

Test the functionality and performance of the machine learning model by sending various test inputs.

Evaluate the model's predictions and analyze the results obtained from Postman.

By the end of these lessons, students should be able to create a notebook instance in SageMaker, develop and deploy machine learning models for inference, and create endpoints using the Gateway API. They will also gain proficiency in testing the deployed model using Postman, allowing them to evaluate and validate the model's performance and functionality.

**Lesson 5 - 2hrs**

**Content**

-Vision/Speech API

**Objective**

**Introduction to Vision/Speech API:**

Understand the concept and purpose of Vision and Speech API in the field of artificial intelligence.

Explore applications of Vision and Speech API, such as image recognition, object detection, speech-to-text, and text-to-speech conversion.

Vision API:

Understand the capabilities and functionalities of Vision API in analyzing and extracting information from images.

Speech API:

Understand the capabilities and functionalities of Speech API in converting spoken language into written text and vice versa.

By the end of these lessons, students should have a comprehensive understanding of the Vision and Speech API, including their features. They will be equipped with the knowledge and skills to leverage Vision and Speech API for various applications, enabling them to explore the realm of computer vision and speech processing in their projects and work.