National University of Computer and Emerging Sciences 0005

Islamabad Campus

MLOps (CS4085)

Course Instructor(s):
Mr. Pir Sami Ullah Shah
Sections: BS (AI) and (SE)

Sessional-I Exam

Total Time (Hrs):	1
Total Marks:	55
Total Questions:	4

Date: Sep 23, 2024

21i-2354 Roll No

AI Course Section

Student Signature

Do not write below this line.

Attempt all the questions.

[CLO 2: Optimize and Refactor Machine Learning Code]

Q1: Consider a simple python application hosted at Github, that needs to build, test and deploy whenever push event occurs in the given repository. **[10 marks]**

Task: Write a Github Actions workflow YAML file that performs the following steps:

- Checks out your code from the repository.
- Sets up a Python environment with the specified version (Python 3.8 in this case).
- Installs the dependencies of your Python application using pip.
- Execute test.py file through make command.

[CLO 4: Orchestrate machine learning pipeline using modern API/tools]

Q2: Consider a software company is planning to implement a Python based project and host it on Github. They like to create a Jenkins job that can execute once a commit is done to the relevant repo's branch. **[5 + 10 = 15 marks]**

Task 1: Write all the steps how Jenkins jobs can be executed on Github's event i.e., push?

Task 2: Write down pipeline as a code that shall comprise multiple steps i.e., build, test, and deploy. Each shall only print a dummy output.

[CLO 2: Optimize and Refactor Machine Learning Code]

Q3: Answer the below questions in just two lines **[3+3+3+2+2+2 = 15 marks]**

- Write down main components of Dockers?
- Why Containerization in MLOps?
- Write down phases that are considered common in both DevOps and MLOps?
- Write main components of Github Actions Workflow?
- How one can make machine learning development more scalable through MLOps?

- List down different categories of GitHub actions' runners.?

[CLO 4: Orchestrate machine learning pipeline using modern API/tools]

Q4: Write the commands against below each point. **[2+2+2+2+2+2+3 = 15 marks]**

- Docker Image Creation
- List of docker images
- Delete docker image
- Creation of docker container
- List of all docker containers
- Deletion of docker container
- Pushing docker image to docker hub.