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Department of Artificial Intelligence and Machine Learning

Course Code:	AI254TA	Date	26.11.2024
Semester	V	Time	2.00-4.00
Max Marks	10+50	Duration	120 mins

Machine Learning Operations (MLOps)

CIE I

Note: Answer all the Questions

Sl. No		Questions	M	BT	CO
		PART – A			
1		CI/CD stands for _____	1	1	1
2		_____solution to avoid the problem of dependencies when deploying ML models.	1	1	1
3		Define MAAS?	2	1	1
4		_____ and _____ metrics can be used asses risk.	2	1	1
5		How do we handle Models that degrade in performance over time due to changes in data patterns or other external factors.	2	2	3
6		Give the need for MLOPs.	2	1	1
		PART – B			
1	a	Give reasons why maintaining Machine Learning life cycle is challenging?	5	2	2
	b	"MLOps is key in mitigating the risks induced by the use of ML models." Justify the statement with a real time example.	5	2	1
2	a	Summarize the similarities and key differences in the role of data scientist in ML Life cycle and ML OPs.	06	2	1
	b	Criticise the effect of reproducing code and environment during ML Model development phase.	04	2	2
3	a	Consider the given scenario: An e-commerce company, ShopSmart, wanted to enhance its customer experience by deploying a machine learning-powered recommendation system. The goal was to recommend personalized products to customers based on their browsing history, purchase patterns, and demographic data. However, ShopSmart faced several challenges in building and maintaining a scalable and efficient ML pipeline due to the frequent updates in user behaviour and product inventory. Draw neat diagram depicting MLOPs pipe line, design and develop MLOPs pipeline for the scenario.	10	3	2,3

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4	a	Discuss the key constraints and issues that might arise with reference to data in the model development cycle. Give appropriate example.	5	2	2
	b	Consider the scenario given in question 3a. Paraphrase any four outcomes if the problem would be pipelined using MLOPS.	5	2	2
5	a	"**FinTech Solutions**, a global financial services firm, specializes in delivering data-driven investment strategies using machine learning (ML). The company leverages advanced ML algorithms to predict stock market trends, optimize investment portfolios, and analyze credit risk. However, managing sensitive financial data while ensuring regulatory compliance, data integrity, quality, accountability and transparency became a challenge as the company scaled its machine learning operations." Justify how implementation of data governance would be a novel solution in the given scenario.	6	4	2
	b	Elaborate the importance of iteration and feed back in ML Life cycle	4	2	2

M-Marks, BT-Blooms Taxonomy Levels, CO-Course Outcomes

Marks Distribution	Particulars	CO1	CO2	CO3	CO4	CO5	L1	L2	L3	L4	L5	L6
	Max Marks Part A	8	-	2			8	2				
	Max Marks Part B	11	29	10				34	10	6		

Course Outcomes: After completing the course, the students will be able to:-

CO1	Identify and apply various ML-Ops techniques to deploy machine learning models for real-world problems.
CO2	Design, deploy and evaluate Machine Learning models, follow the operational practices to benefit society, science, and industry.
CO3	Use modern tools and techniques to organize ML model from development to production for real world problems
CO4	Demonstrate effective communication through team presentations and reports to analyse the impact of the standard MLOPs practices on industry and society.
CO5	Conduct performance evaluation, design, deploy models in par with the appropriate Governance for the benefit of the industry and society.