GL BAJAJ
Institute of Management & Research
Greater Noida
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POST GRADUATE DIPLOMA IN MANAGEMENT (2024-25)
MID TERM EXAMINATION (TERM -III)

Subject Name: **Machine Learning and Business Mgmt.**	Time: **01.00 hers**
Sub. Code: **PGIT31**	Max Marks: **20**

Note: All questions are compulsory. Section A carries 10 marks: 2 questions of 5 marks each, Section B carries 10 marks one Case Study having 2 questions of 5 marks each.

SECTION – A		
Attempt any two questions.		**2×5 = 10 Marks**
Questions	**CO**	**Bloom's Level**
Q.1: Describe supervised learning. Write names of two supervised learning algorithms Compare supervised learning and unsupervised learning. **Q2** Compare Support Vector Machine (SVM). Explain it with diagram	CO1	L4
Q3: What is ensemble learning? Compare the concepts of bagging and boosting in improving classification accuracy.	CO2	L3

SECTION – B		
Read the case and answer the questions		**02×5 = 10 Marks**
Questions	**CO**	**Bloom's Level**
Leveraging Machine Learning for Business Transformation: The Case of XYZ Retail Ltd. XYZ Retail Ltd. was grappling with **operational inefficiencies, including fluctuating sales, ineffective marketing strategies, and rising instances of online fraud**. Recognizing that traditional decision-making frameworks were no longer sufficient, **CEO Raj Sharma** turned to **Chief Data Officer Meera Kapoor** for a data-driven solution. Meera proposed the integration of **machine learning models** to optimize business operations by leveraging the company's vast repository of customer and sales data. The first initiative focused on **enhancing sales forecasting** through advanced **regression models**. While **Simple Linear Regression, Multiple Linear Regression, and Polynomial Regression** provided valuable insights into advertising impact, seasonal trends, and pricing dynamics, these methods proved insufficient in handling complex consumer behavior patterns. To address this challenge, the company implemented **Support Vector Regression (SVR), Decision Tree Regression, and Random Forest Regression**, significantly improving predictive accuracy. The adoption of **Random Forest Regression** led to a **30% increase in forecast precision**, enabling **better inventory management, reduced stock shortages, and minimized wastage**, thus driving operational efficiency. Building on this success, the company shifted its focus to **customer segmentation and marketing optimization**. Previously, XYZ Retail employed a one-size-fits-all promotional strategy, which resulted in **low engagement and inefficient allocation of marketing budgets**. By utilizing **classification**	CO1, CO2	L4 L4

models such as **Logistic Regression, K-Nearest Neighbors (K-NN), Support Vector Machine (SVM), and Kernel SVM**, the company effectively categorized customers based on their purchasing behavior. Additionally, **Naïve Bayes and Decision Tree Classification** facilitated **predictive modeling of customer responses**, enabling targeted and personalized marketing campaigns. Among these, **Random Forest Classification** emerged as the most effective, contributing to a **20% increase in customer engagement and a 15% rise in sales**. Encouraged by these outcomes, Raj and his team extended machine learning applications to **fraud detection**. Online fraud and chargebacks posed a significant financial risk, prompting the deployment of **Logistic Regression, Naïve Bayes, SVM, and Random Forest Classification** to identify fraudulent transactions. This **proactive fraud detection mechanism successfully flagged 85% of suspicious activities before transaction completion**, leading to a **35% reduction in financial losses** and fortifying the company's financial security. Through the strategic integration of machine learning, **XYZ Retail transitioned from a conventionally managed enterprise to a data-driven organization**. Enhanced sales forecasting, **precision-driven marketing strategies, and robust fraud prevention measures** collectively strengthened the company's competitive position in the retail industry. CEO Raj Sharma recognized that **machine learning was no longer just a technological enhancement but a fundamental driver of business sustainability and growth**. As XYZ Retail continued to expand its data-driven initiatives, it positioned itself for long-term success, proving that even traditional retail businesses could **achieve unprecedented efficiency and profitability through the power of advanced analytics and machine learning models**.

Questions based on the case study. Attempt both parts.

    4a. What were the major operational challenges faced by XYZ Retail Ltd., and how did machine learning help address them? Provide examples from the case study.

    4b. How does predictive analytics help in making business decisions? Illustrate with examples from XYZ Retail Ltd.'s use of machine learning models.

Kindly fill the total marks allocated to each CO's in the table below:

COs	Marks Allocated
CO1	10 Marks
CO2	10 Marks
CO3	
CO4	

(Please ensure the conformity of the CO wise marks allocation as per your TLEP.)

Blooms Taxonomy Levels given below for your ready reference:

L1= Remembering
L2= Understanding
L3= Apply
L4= Analyze
L5= Evaluate
L6= Create