**Machine Learning – I**

**December 2023 Examination**

**1. Describe the steps in building Linear Regression model? Discuss any two real work problem where this model is help to find the problem? (10 Marks)**

**Ans:**

**Introduction to Linear Regression:**

Linear regression is a foundational and extensively used statistical approach in machine learning and data analysis. It is a fundamental device for modeling the relationship between a dependent variable (the output or target) and one or more impartial variables (the inputs or functions). The core idea behind Linear Regression is to identify a linear equation that fine represents the relationship among the variables. This equation lets us make predictions or estimates based on the given inputs.

The simplicity and interpretability of Linear Regression make it an attractive desire for various applications. Its name, "linear," originates from the truth that the relationship among

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**2. Why feature selection is important in the context of Machine Learning. How will you effectively select a few features to start off your model building process? State some of the techniques for Feature Selection in Machine Learning. (10 Marks)**

**Ans:**

**Introduction**

Function selection is pivotal in enhancing model performance and interpretability in device learning. It involves choosing a subset of relevant capabilities from the authentic function set to improve the model's predictive ability, lessen overfitting, and boost computational efficiency. In essence, feature selection helps identify the maximum informative attributes that contribute notably to the prediction venture, thus simplifying the version while maintaining its accuracy.

The importance of function choice lies in its capability to address the "curse of dimensionality." high-dimensional statistics might also contain irrelevant, redundant, or noisy features that adversely affect version performance. Feature choice mitigates these issues by

**3. An e-commerce company has collected a large amount of data on customer transactions, including the items purchased, the price, and the date of purchase. The company wants to use this data to improve its sales and marketing strategies, but the data is too large and complex to be analyzed effectively using traditional methods.**

**The e-commerce company decided to use machine learning algorithms to perform data reduction on the customer transaction data. They used a dimensionality reduction algorithm such as principal component analysis (PCA) to reduce the number of variables and simplify the data.**

**a. What were the result of using machine learning algorithms for data reduction in this case study? (5 Marks)**

**Ans:**

**Introduction**

Inside the rapidly evolving global of e-trade, corporations are inundated with significant data generated from consumer transactions. This fact holds the titanic ability for understanding purchaser conduct, options, and purchasing styles. However, this fact's sheer volume and complexity can crush traditional analytical approaches. System learning, mainly dimensionality discount algorithms like principal component evaluation (PCA), offers a

**b. How did the use of machine learning algorithms help the e-commerce company to analyze the customer transaction data and improve its sales and marketing strategies? (5 Marks)**

**Ans:**

**Introduction**

In the era of digitalization, businesses are accumulating sizable amounts of data, along with customer transaction facts, at an unprecedented fee. However, deriving significant insights from these records can be daunting due to their length and complexity. To utilize this data and optimize enterprise strategies, e-commerce companies are turning to machine learning algorithms. Beneath their capacity to process and examine large and tricky datasets, those