JAIPURIA INSTITUTE OF MANAGEMENT

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PGDM / PGDM (M) / PGDM (SM)

FOURTH TRIMESTER (Batch 2023-25)

END TERM EXAMINATIONS, SEPTEMBER 2024

SET - B

Course Name	Machine Learning	Course Code	**20827**
Max. Time	**2 hours**	Max. Marks	**40 MM**

INSTRUCTIONS:

a. All questions are compulsory to attempt

1. Read the following case and answer the questions given at the end:

Chaiwala Innovations Pvt. Ltd.

In the bustling city of Bangalore, a pair of visionary MBA graduates, Ravi and Priya, saw an opportunity to transform India's beloved tea-drinking tradition. In 2018, they founded Chaiwala Innovations Pvt. Ltd., a startup with a mission to bring premium, hygienic, and convenient chai options to urban consumers.

Their journey began humbly, with a small kiosk nestled in a busy tech park. The response was overwhelmingly positive, as office-goers and techies flocked to their kiosk for a refreshing cup of chai. Encouraged by their early success, Ravi and Priya decided to expand their venture. They envisioned a future where Chaiwala Innovations would have a presence in every major Indian city.

By leveraging a franchise model, Chaiwala Innovations began to grow rapidly. Each outlet offered a diverse range of chai flavors and quick bites, all made with the highest quality ingredients and innovative recipes. They aimed to provide a unique customer experience, blending traditional chai with modern convenience. To further enhance their service, they launched a mobile app for online orders and delivery, loyalty programs, and even branded merchandise like stylish cups and teapots.

However, as the number of outlets increased to 50 across the country, Ravi and Priya faced new challenges. Maintaining the same high quality and taste of chai at every location proved to be difficult. Customer complaints about inconsistent quality began to surface, threatening to tarnish the brand's reputation. Some franchise owners struggled to adhere to the stringent standards set by Chaiwala Innovations. They sometimes deviated from the exact recipes or used different ingredients, leading to variations in taste and presentation. High staff turnover further compounded the problem, as new employees often lacked proper training and failed to uphold the company's quality guidelines.

Another significant challenge was ensuring a steady supply of premium ingredients. Chaiwala Innovations prided itself on sourcing high-quality tea leaves and spices for its unique blends. However, fluctuations in supply, inconsistent quality from suppliers, and logistical delays disrupted their operations. When the ingredients fell short of the required standards or were unavailable, the quality of the chai suffered, leading to dissatisfied customers.

Despite these hurdles, Ravi and Priya remained determined to uphold their vision. They recently secured a substantial investment to address these issues and continue their expansion. They knew that by improving their operations and maintaining their competitive edge, Chaiwala Innovations could fulfill its promise of revolutionizing the chai-drinking experience in India.

Case Question

Facing the ongoing challenges with their business, Priya asked, " How can we overcome the current issues with the help of Data Analytics?"
Identify any two challenges from the case and provide its solution one using Regression technique and the other using Classification technique? In both the cases discuss the complete steps involved in solving an analytics problem. **(7+7 = 14 marks)**

2. Quantum Retail Ltd., an e-commerce company, is analyzing the weekly sales data of a newly launched product. The sales team suspects that there might be an outlier in the data, which could be due to a promotional event held in one particular week. They want to ensure that this outlier does not skew the overall analysis. The weekly sales data (in units) for the past seven weeks is as follows: **[250, 300, 270, 260, 1500, 280, 290]** **(3+3 = 6 marks)**

Questions:

a) Identify the outlier in the given sales data. Explain why it is considered an outlier.
b) Apply any one outlier treatment method to handle the outlier in this dataset.

3. Suppose you have appeared for an interview for the position of Machine Learning Analyst. The interview panel has asked you to analyze and explain the following by illustrating a business case.

(4*4 = 16 Marks)

a. Overfitting versus underfitting in machine learning
b. Supervised Learning versus Unsupervised Learning
c. Standardization versus Normalization
d. What does it mean when the p-values are high or low

4. Analyze the graph of the budget (in crores) of all the movies released during the years 2020-2023. Identify three key insights based on your interpretation of the data. Additionally, evaluate the effectiveness of this visualization technique for conveying information about movie budgets. Suggest two alternative visualization methods that could better represent this data and justify your choices.

(2+2 = 4 Marks)