PGDM & PGDM (IB), 2020-22

Time Series Forecasting

DM-473/IB-472

Trimester – IV, End-Term Examination: September 2021

Time allowed: 1 Hr 30 Min

Max Marks: 50

Roll No: _____

Instruction: Students are required to write Roll No on every page of the Answer Sheet. All other instructions on the question paper / notifications should be followed meticulously.

1. Both part A and part B are mandatory
2. Each question in part A carries 10 marks and part B carries 20 marks
3. The total time for the exam is 2 hours and 30 minutes
4. Do submit the calculation sheet and copy of codes along with the answer sheet

Part A : (30 marks)

Q1.

a. What is Forecasting and what are the different forecasting techniques we do have? Explain one of the quantitative Time series forecasting technique in detail. Give an example with data table where we can use this technique.

OR

b. What is Time Series analysis and what are the different Time series forecasting techniques we do have? Explain Exponential Smoothing technique in detail. Give an example with data table where we can use this technique.

Q2.

a. What is Time Series Decomposition and what are the different components of Decomposition method ? When do we use multiplicative or additive model and write the mathematical form of additive Decomposition model. Which one is the first component of the Decomposition method and explain how do we estimate that component in detail.

OR

b. What is Stationarity? How do we differentiate between additive and multiplicative seasonality? Explain Holt-Winter additive model in detail with mathematical expression.

Q3.

a. What is ARIMA model? What are the different parameters we do have in ARIMA model? Explain each parameter and how do we identify order of those parameters?

OR

b. What is ARMA model? What are the different parameters we do have in ARMA model? Explain each parameter and how do we identify order of those parameters?

Part B : (20 marks)

One of the manufacturing company want to do improve on time delivery of one of their products. There are two plants where plant A can build 60% of the product and plant B can manage 40% demand.

Based on the last year 2 years weekly aggregated demand (refer data "weekly product demand" file), business want to get weekly demand forecast at plant level for next 1 quarter for better planning. Considering mentioned information how you can help business through optimum ARIMA model (with high accuracy) using python. Make a business report based on your analysis to address customer challenges. While you are writing please cover below areas:

- Introduction
- Problem Statement
- Data & Methodology
- Results & Findings (including code and output)
- Conclusion & Recommendations

weekly product demand_s1.csv