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| **SESSION** | **July 2023** |
| **PROGRAM** | **MASTER OF BUSINESS ADMINISTRATION (MBA)** |
| **SEMESTER** | **IV** |
| **course CODE & NAME** | **DADS401- Advanced machine learning** |
| **CREDITS** | **04** |
| **nUMBER OF ASSIGNMENTS & Marks** | **02****30 MARKS EACH** |

**Assignment Set – 1**

**1a.Explain the elements of Time Series Model?**

**Ans 1a.**

**Elements of Time Series Model**

Time series modeling is a statistical approach to understand and predict future points in a series using historical data. Understanding the elements of a time series model helps in better model selection and interpretation. The key elements include:

1. **Trend**: It

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**2a.Discuss time series using ARIMA model.**

**Ans 2a.**

**Discussing Time Series using ARIMA Model:**

ARIMA, which stands for AutoRegressive Integrated Moving Average, is a popular forecasting model for time series data. The ARIMA model incorporates three main components:

1. **AR (**

**2b.Discuss stationary and non-stationary time-series with suitable example.**

**Ans 2b.**

**Discussing Stationary and Non-stationary Time Series:**

A time series is said to be stationary if its statistical properties, such as mean, variance, and autocorrelation, remain constant over time. Essentially, the series doesn't exhibit trends or seasonali

**3a.Discuss types of exponential smoothing methods.**

**Ans 3a.**

**3a. Types of Exponential Smoothing Methods**

Exponential smoothing is a time series forecasting technique that assigns exponentially decreasing weights to past observations. This method captures different types of trends and seasonalities in the data. Here are the main types

**3b.Define ARCH Model? Discuss its usage.**

**Ans 3b.**

**ARCH Model: Definition and Usage**

**Definition**: The ARCH (Autoregressive Conditional Heteroskedasticity) model was introduced by Robert Engle in 1982. ARCH models are employed to model and forecast financial time series data with changing variances over time. These variances might be triggered by external shocks or changes in the market, resulting in volatility clustering (periods of high volatility are

**Assignment Set – 2**

**4a. Discuss any five applications of deep learning.**

**Ans 4a.**

**Five Applications of Deep Learning:**

1. **Image Recognition and Classification**: Deep learning has made significant strides in image recognition and classification tasks. Convolutional Neural Networks (CNNs) have been particularly successful in identifying objects, faces, and patterns within images. Applications include autonomous vehicles, medical image analysis, and content filtering in social

**4b. Write a short note on ANN classification model.**

**Ans 4b.**

**ANN Classification Model**:

Artificial Neural Networks (ANNs), also known as neural networks, are a class of machine learning models inspired by the human brain's structure and function. They consist of interconnected nodes, or neurons, organized into layers: an input layer, one or more hidden layers, and an output layer. ANN classification models are primarily used for solving classification problems,

**5a. Differentiate CNN vs RNN.**

**Ans 5a.**

**Differentiate CNN vs RNN:**

CNN (Convolutional Neural Network) and RNN (Recurrent Neural Network) are both types of neural networks used in deep learning, but they have different architectures and are suited for different types of data and tasks.

CNN (

**5b. Explain the classification of Layers of CNN.**

**Ans 5b.**

**Classification of Layers of CNN:**

Convolutional Neural Networks (CNNs) typically consist of several layers, each serving a specific purpose in feature extraction and classification. These layers can be classified into the following categories:

1. Input Layer:

**6a. Explain Two main challenges faced in RNN.**

**Ans 6a.**

**Two main challenges faced in RNN (Recurrent Neural Networks):**

1. Vanishing and Exploding Gradients: One of the primary challenges with RNNs is the problem of vanishing and exploding gradients. This occurs during training when the gradients of the loss function with respect to the model's parameters become extremely small (vanishing) or extremely large (exploding) as they are propagated backward

**6b. State few problems or challenges faced with RL systems.**

**Ans 6b.**

**Problems and challenges faced with RL (Reinforcement Learning) systems:**

1. Sample Efficiency: RL algorithms often require a large number of interactions with the environment to learn optimal policies. This high sample complexity can be a significant challenge, particularly