

**Week 2: Advanced Statistics (Total video duration= 4 hours. You will be required to spend 60 minutes/day along with practicing datasets and quizzes)**

**Mentor Session Duration: 4 hours**

**Faculty Name: Dr. Abhinanda Sarkar**

**Number of videos: 16**

## **Learning Outcomes from the Module:**

After learning from this module, learners will be able to understand:

▶ **Basic Concept of ANOVA - One Way and Two Way ANOVA**

▶ **Concept of EDA**

▶ **Univariate and Multi-Variate Analysis**

▶ **Dealing with Missing Values and Outliers**

▶ **Concept of Principal Component Analysis**



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Video No.	Video Name	Duration of the video	Topics Covered	Conceptual or Hands On
1	<a href="#">EDA Outline</a>	1:47	<ul style="list-style-type: none"> <li>What is EDA?</li> </ul>	Conceptual
2	<a href="#">Introduction to EDA</a>	7:22	<ul style="list-style-type: none"> <li>Historical Background of EDA</li> <li>Concepts of Data and Variable</li> </ul>	Conceptual
3	<a href="#">Descriptive Data Measures</a>	8:55	<ul style="list-style-type: none"> <li>Concept of Measures of Central Tendency</li> <li>Concept of Measures of Dispersion</li> </ul>	Conceptual
4	<a href="#">Five Number Summary</a>	4:38	<ul style="list-style-type: none"> <li>Concept of Five Number Summary</li> <li>Why is central tendency and dispersion part of Five Number Summary</li> <li>Concept of Skewness</li> </ul>	Conceptual
5	<a href="#">Boxplot, Co-variance and Coefficient of Correlation</a>	4:03	<ul style="list-style-type: none"> <li>Concept of Boxplot</li> <li>Concept of Co-variance</li> <li>Concept of Correlation</li> </ul>	Conceptual
6	<a href="#">Let's get our hands dirty with code</a>	22:14	<ul style="list-style-type: none"> <li>Hands on Exercise on Graduate Admission to understand the concept of EDA</li> </ul>	Hands On
7	<a href="#">Summary</a>	1:04	<ul style="list-style-type: none"> <li>Brief pointers to understand the entire concept of EDA</li> </ul>	Conceptual
8	<a href="#">Outline</a>	1:00	<ul style="list-style-type: none"> <li>Next agenda of EDA – topics that would be covered</li> </ul>	Conceptual

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9	<a href="#">Univariate and Multivariate Analysis</a>	17:01	<ul style="list-style-type: none"> <li>Concept of Univariate and Multi Variate Data Analysis</li> </ul>	Conceptual
10	<a href="#">How do we deal with categorical data?</a>	9:56	<ul style="list-style-type: none"> <li>Ways to handle non-numerical (categorical) data</li> <li>Sklearn Label Encoding</li> </ul>	Conceptual
11	<a href="#">Normalization and Scaling</a>	10:19	<ul style="list-style-type: none"> <li>Concept of Transformation explained through Normalization and Scaling</li> </ul>	Conceptual
12	<a href="#">Data Pre-processing</a>	2:04	<ul style="list-style-type: none"> <li>Concept of Data pre-processing is explained that is an important follow up to EDA</li> </ul>	Conceptual
13	<a href="#">Dealing with Missing Values and Duplicates</a>	13:37	<ul style="list-style-type: none"> <li>Ways to identify, replace and remove missing values or garbage values and duplicates</li> </ul>	Conceptual + Hands On
14	<a href="#">Dealing with Outliers</a>	15:27	<ul style="list-style-type: none"> <li>Another dimension of data cleaning explained</li> </ul>	Conceptual + Hands On
15	<a href="#">Bivariate Analysis</a>	28:39	<ul style="list-style-type: none"> <li>Concept of Bivariate Analysis as an intermediate between Univariate and Multivariate Analysis explained</li> </ul>	Conceptual + Hands On
16	<a href="#">Pandas Profiling</a>	9:27	<ul style="list-style-type: none"> <li>Concept of Pandas Profiling and generation of profile reports</li> </ul>	Conceptual + Hands On

## Few textbooks that you can refer to:

1

**John Tukey**

Exploratory Data Analysis

2

**Allen B. Downey**

Think Stats

3

**Stephen Henry**

Graphical EDA

