

**Week 1: Advanced Statistics (Total video duration= 2 hours. You will be required to spend 30 minutes/day along with practicing datasets and quizzes)**

**Mentor Session Duration: 2 hours**

**Faculty Name: Dr. Abhinanda Sarkar**

**Number of videos: 8**

## **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="#">Introduction to ANOVA</a>                        | 11:15                 | <ul style="list-style-type: none"> <li>What is ANOVA?</li> </ul>                                                                                                                     | Conceptual             |
| 2         | <a href="#">Assumptions of ANOVA</a>                         | 02:00                 | <ul style="list-style-type: none"> <li>Three underlying assumptions regarding One Way ANOVA</li> </ul>                                                                               | Conceptual             |
| 3         | <a href="#">Hypothesis Test of One-Way ANOVA</a>             | 09:00                 | <ul style="list-style-type: none"> <li>Concept of Null &amp; Alternate Hypothesis</li> <li>Partition of Total Variation</li> </ul>                                                   | Conceptual             |
| 4         | <a href="#">One Way ANOVA Example</a>                        | 14:00                 | <ul style="list-style-type: none"> <li>Real Life Case Study of One Way ANOVA</li> <li>How One Way ANOVA Classification works in practice?</li> <li>Computation of F-value</li> </ul> | Conceptual             |
| 5         | <a href="#">Two Way ANOVA and Its assumptionss</a>           | 04:12                 | <ul style="list-style-type: none"> <li>Concept of Two Way ANOVA</li> <li>Assumptions underlying Two Way ANOVA</li> </ul>                                                             | Conceptual             |
| 6         | <a href="#">Difference between one-way and two-way ANOVA</a> | 04:00                 | <ul style="list-style-type: none"> <li>Points of difference between One Way and Two Way ANOVA</li> </ul>                                                                             | Conceptual             |
| 7         | <a href="#">Hands On Exercise on ANOVA</a>                   | 35:00                 | <ul style="list-style-type: none"> <li>Understanding ANOVA in Python</li> </ul>                                                                                                      | Hands On               |
| 8         | <a href="#">Summary of ANOVA</a>                             | 05:30                 | <ul style="list-style-type: none"> <li>Summarisation of the entire concept of ANOVA</li> </ul>                                                                                       | Conceptual             |

## Few textbooks that you can refer to:

1

**Dr. PK Vishwanathan**  
Business Statistics

2

**Dr. PN Arora**  
Statistics for Management

3

**Mr. Pratap Dangeti**  
Statistics for Machine Learning

