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Week 2: Probability and Probability Distribution(Total video duration= 2 hours. You will be required to spend 25 min/day along with practice datasets and quizzes)

Learning Outcomes from the Module:

From this week's learning content, learners will be able to understand:

- Important concepts in Probability- Experiment, Sampling Space, Event
- Rules for computing Probability, Marginal Probability and its example
- Bayes theorem with an example
- Binomial, Poisson and Normal Distribution
- Hands on with different Distributions on Python

Mentor Session Duration:	Faculty Name:	No. of videos:
2 hours	Mr. Abhinanda Sarkar	9

Video No.	Video Name	Duration of the video	Topics Covered	Conceptua/ Hands On
1	Probability and Distributions Outline	01:00 min	• Looking at the mathematical representation of data which will help in doing calculation necessary for Inferential Statistics	Conceptual
2	Probability - Meaning and concepts	10:00 min	• Understanding what is Experiment, Sampling Space, Event to define Probability.	Conceptual
3	Rules for Computing Probability	14:00 min	• Addition rules for mutually exclusive events and mutually non-exclusive events. Multiplication Rule for Independent events and when events are not Independent through an example of deck of cards.	Conceptual
4	Marginal Probability and Example	07:00 min	• Probability calculated using a Contingency table with the example of Family Income data	Conceptual
5	Bayes theorem and Example	28:00 min	• Bayes' theorem is used to revise intial or prior probabilities in the light of some given information	Conceptual
6	Binomial Distribution and Example	10:00 min	• Binomial distribution is a probability distribution used on discrete, random variables, used on fixed no. of trials that are independent and random with only 2 outcomes. It is also called as Bernoulli process.	Conceptual

7	Poisson Distribution and Example	06:00 min	• Poisson Distribution is used when we are interested in a count, not necessarily a count expressed as proportion/fraction.	Conceptual
8	Normal Distribution and Example	11:00 min	• The population distribution associated with Normal Distribution is a bell shaped curved, and its used for continuous data. +/- 1 standard deviation around the mean contains around 68% of the data in the bell curve.	Conceptual
9	Demo on Distributions calculations using Python	19:00 min	• Hands-On in Python for Binomial, Poisson and Normal Distribution by importing packages- Scipy, NumPy and matplotlib for this to work on the case study of paying of bills on time for credit card customers.	Hands-On

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Few references that you can refer to:

1

http://onlinestatbook.com/2/probability/probability.html

https://statisticsbyjim.com/basics/probability-distributions/

2

http://onlinestatbook.com/2/probability/bayes_demo.html

https://www.mathsisfun.com/data/bayes-theorem.html

3

http://onlinestatbook.com/2/probability/binomial.html