



TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)

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Accredited with NAAC **A** Grade

12-B Status from UGC

Essentials of Data Science using Julia (Introduction to Data Science using Julia)

Duration: 40 Hrs

Modules: Total 6 Modules

Prerequisite: Basic Programming Knowledge (Like C language)

1. Data Science and Machine Learning: The requirement of time

a. Introduction to Data Science

i. What is this? ii.

Why?

iii. Where?

b. Introduction to Machine Learning

i. What is this? ii.

Why?

iii. Where?

2. Julia's Basic

a. Introduction to Julia

b. Installation instructions (Windows / Linux)

c. Basic Constructs of Julia

i. Variables, Numbers and Comments ii. Strings,

Arrays, Tuples, Dictionary, Set iii. Conditional

Structure and Looping iv. Functions and Packages

3. Julia's Essential Libraries of Data Science : Managing Third Party Package in Julia

a. Vector & Matrix Processing : The Numerical Julia

i. Random Package :A brief introduction and installation instructions ii. Random Package : Usage and Operations iii. Algebra Operations: Built-in methods, vector methods and attributes iv. Indexing, slicing, broadcasting & boolean masking

v. Arithmetic Operations & Universal Functions

b. Data Analysis with Data Frames : The Data Frames in Julia

i. Introduction to Data Frames in Julia

ii. Installation Instructions iii. Reading and Writing Data Frames iv. Row and Column Operations in Data Frames

v. Reading CSV and other files vi.

Handling Missing Data vii. Data

Wrangling - Co viii. Data Frames Groupby

c. Data Visualization in Juila

i. Installation Instructions to Plots Package ii. Plotting with Plots

- I. Plots Essentials I- Basic Plotting Exercise
 2. Plots Essentials 2- Different types of plots
 3. Plots Essentials 3- Plotting DataFrames
 4. Plots Essentials 4- Visualizing real dataset
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d. Mini Project using real dataset

4. Essentials Statistics for DS and Data Wrangling

- a. Population & Sample
- b. Types of Data
- c. Introduction of Measures Central Tendency
- d. Data Mangling in Julia

5. GLM Package of Julia: Basic ML in Julia

a. Introduction to ML - What, Why?

b. Introduction to GLM Package

C. Regression Model : Introduction

i. GLM I: Linear Regression Model - Hands-on ii. Project Demonstration using real dataset using linear regression

d. Classification Model : Logistic Regression Introduction

i. GLM 2: Logistic Regression Model - Hands-on

e. Multiple Linear Regression : Introduction

i. GLM 3: Multiple Regression Model- Hands-on

6, Projects : DS & ML (More Exercise, Project Phases and Assessment)

a. 2 Projects on real dataset based on the learning : Phases of Data Science Project

i. Collection of Data ii. Data Mangling /
Wrangling (EDA) iii. Data Visualization iv.
Model Selection

v. Model Preparation vi. Model Evaluation
& Deployment

b. Two MCQ Quiz Assessment

c. Final Project for Assessment

