# AY24 Sem2 BC2407 Computer Based Assessment Question Paper

# Crop Yield

## Introduction

The Ministry of Agriculture and Farmers Welfare in India has the mandate to improve the overall state of agriculture in India by providing stronger planning, better coordination, and greater funding to improve productivity and overall output. Analytics and Machine Learning are now considered to estimate Yield for four major crops.

## Part A: Data Exploration and Research Questions (30%)

1. Explore the data and show three important findings.
2. Propose two research questions that can be answered from the dataset and models learnt in this course.
3. Briefly explain how you would solve the two research questions.

## Part B: Analytics and Models[1] (40%)

4. Using Crop Years before 2018 as the trainset and the rest as the testset, compare the predictive performance of (a) Linear Regression, (b) MARS and (c) Random Forest, and display the results in a table. Which model performed the best?
5. Answer the two research questions that you proposed in Part A.

## Part C: Conclusion and Key Insights (30%)

6. Summarize the most important findings and recommendations to the Ministry in less than 600 words.

[1] Your code (e.g., Rscript, Python script) must be submitted as separate files but all answers should be complete in the CBA Submission word document file without having to read or execute any other files.

# Appendix A

## About the Dataset

| | |
|---|---|
| Crop: | The name of the crop cultivated. |
| Crop_Year: | The year in which the crop was grown. |
| Season: | The specific cropping season (e.g., Kharif, Rabi, Whole Year). |
| State: | The Indian state where the crop was cultivated. |
| Area: | The total land area (in hectares) under cultivation for the specific crop. |
| Annual_Rainfall: | The annual rainfall received in the crop-growing region (in mm). |
| Fertilizer: | The total amount of fertilizer used for the crop (in kilograms). |
| Pesticide: | The total amount of pesticide used for the crop (in kilograms). |
| Yield: | The calculated crop yield (in metric tons per unit area). |