Great choice! Here's how we’ll break down your **"Crop Yield Prediction Based on Weather"** project step-by-step to align with the exam structure:

**✅ PROJECT STRUCTURE**

**1. Problem Definition & Planning**

* **Sector**: Agriculture 🌾
* **Problem Statement**:  
  *“Can we predict maize crop yield using rainfall and temperature data in order to support informed agricultural planning and food security?”*
* **Dataset Source**:  
  [FAOSTAT Crop Data – Maize Production](https://www.fao.org/faostat/en/#data/QC)  
  You can also pull weather data (rainfall and temperature) from:
  + [World Bank Climate Data](https://climateknowledgeportal.worldbank.org/)
  + [NOAA Climate Data](https://www.ncei.noaa.gov/)
  + Or combine using Kaggle datasets if matched by country/year.

**2. Python Tasks (Jupyter Notebook)**

**🔹 Data Preprocessing**

* Merge maize yield data with rainfall and temperature data (by country/year)
* Handle:
  + Missing values
  + Unit conversions (e.g., mm of rainfall)
  + Encoding (for country if needed)

**🔹 Exploratory Data Analysis (EDA)**

* Histograms of yield, rainfall, temperature
* Correlation heatmap
* Trend plots of yield vs. year, rainfall vs. yield

**🔹 Regression Model**

* Suggested models:
  + **Linear Regression** (baseline)
  + **Random Forest Regressor** (robust, interpretable)
* Split into train/test sets
* Train model and predict yield
* Evaluate using:
  + RMSE (Root Mean Square Error)
  + R² Score

**🔹 Innovation Ideas (Extra Marks!)**

* Feature engineering: calculate rolling averages or rainfall variance
* Use ensemble models like XGBoost
* Visualize prediction residuals

**3. Power BI Dashboard**

**📊 Recommended Charts**

* **Line Charts**:
  + Yield trends by year
  + Rainfall/temperature trends
* **Scatter Plot**:
  + Yield vs. Rainfall / Temperature
* **Map View**:
  + Average maize yield by country or region
* **Slicers/Filters**:
  + Country
  + Year
  + Weather condition category (e.g., dry, moderate, wet)

**💡 Power BI Tips**

* Use DAX to calculate YoY growth
* Add bookmarks or tooltips for storytelling
* Consider using an AI visual to explain model prediction

**4. Submission Package**

* **GitHub Repo**:
  + README.md with intro, setup, and screenshots
  + Jupyter notebook with all code & markdown
  + data/ folder for datasets
  + powerbi/ folder with .pbix file
* **PowerPoint Slides**:
  + Slide 1: Title & Sector
  + Slide 2: Problem Statement
  + Slide 3: Dataset description
  + Slide 4: Methodology (Python + Power BI)
  + Slide 5: Results (charts + model performance)
  + Slide 6: Recommendations + Future Work

**✅ Next Steps**

Would you like me to:

1. Help you **find/download the dataset**?
2. Build a **Jupyter Notebook structure with real code**?
3. Draft the **Power BI layout**?
4. Start with the **README or PowerPoint** template?

Let’s begin where you’re ready.