ICTSS00120 - Artificial Intelligence Skill Set

Session 11: Understanding CRISP-DM

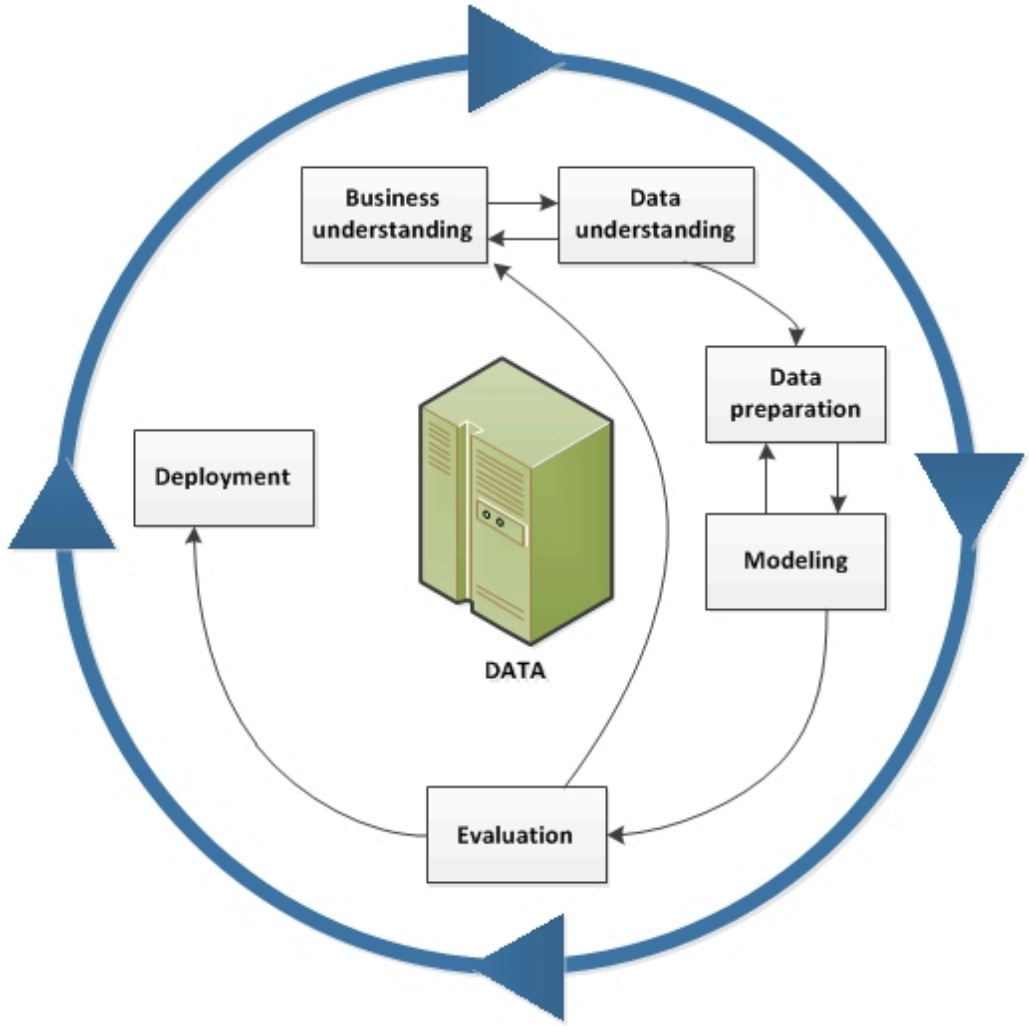
Lecturer: Jordan Hill

Learning Objectives

- Understand the CRISP-DM methodology and its importance in AI/ML projects.
- Apply Phase 1 – Business Understanding of CRISP-DM to a case study.
- Recognize the key activities in Phase 2 – Data Understanding.
- Explore how Phases 3, 4, & 5 integrate with prior learning.

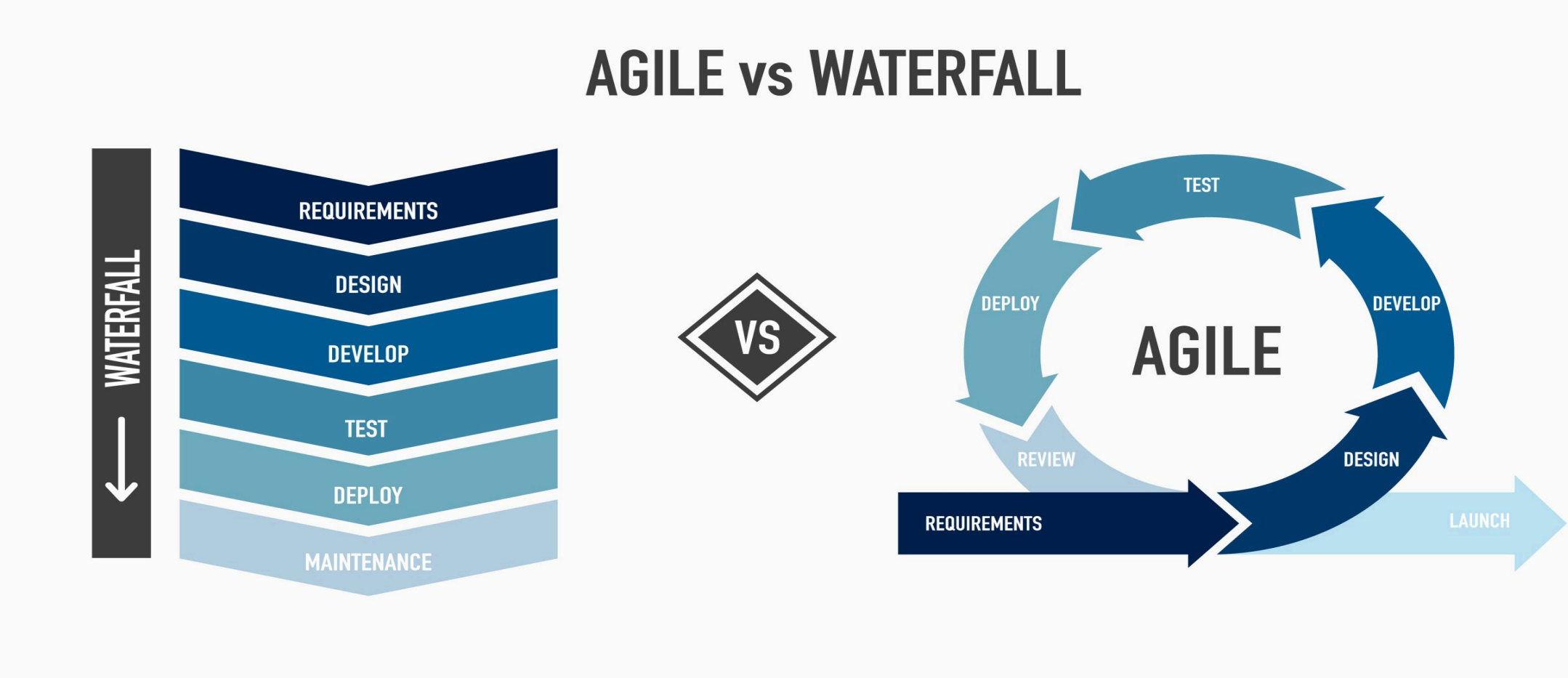
What is CRISP-DM?

- **CRISP-DM** stands for **Cross-Industry Standard Process for Data Mining**.
- It provides a **structured approach** for planning and executing data mining projects.
- Widely used in industry for guiding data science and machine learning projects.



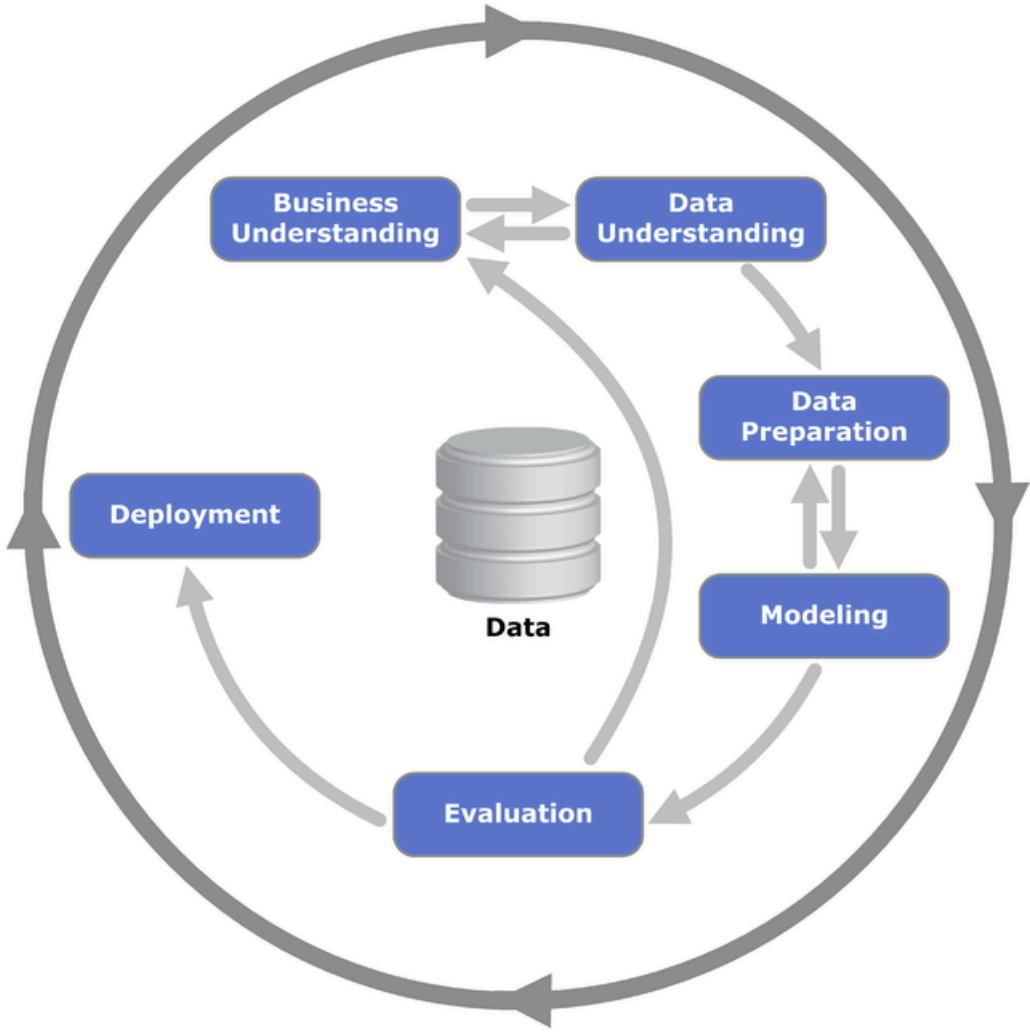
What do we already know about project management?

Agile? Waterfall?



CRISP-DM Phases Overview

1. **Business Understanding**
2. **Data Understanding**
3. **Data Preparation**
4. **Modeling**
5. **Evaluation**
6. **Deployment**

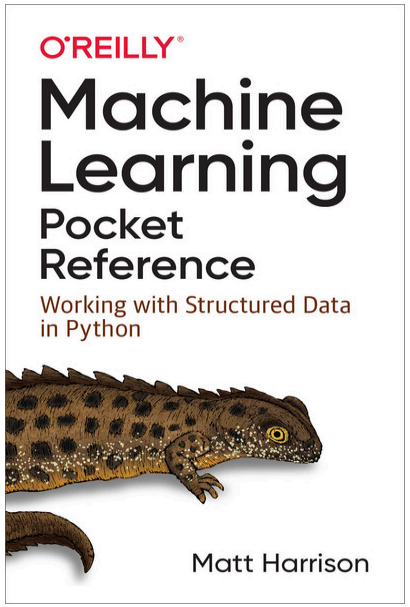


Why do we need this?

You will be expected to implement CRISP-DM throughout your final project

Today we will work through each stage in-depth

Reference Materials:



Phase 1: Business Understanding

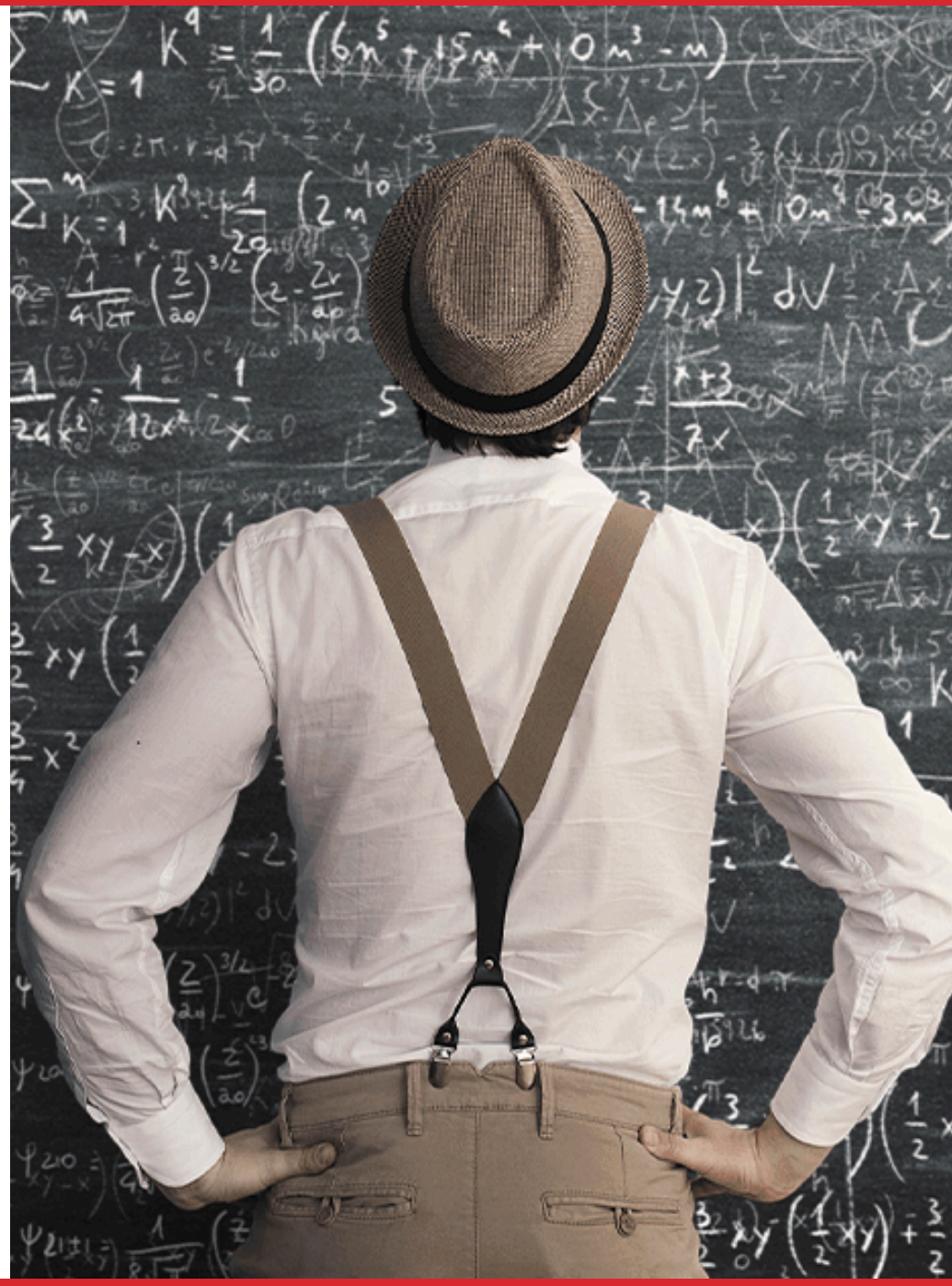
- **Objective**: Understand the project objectives and requirements from a business perspective.
- **Key Steps**:
  - **Determine Business Objectives**
  - **Assess the Situation**
  - **Establish Data Mining Goals**
  - **Produce Project Plan**

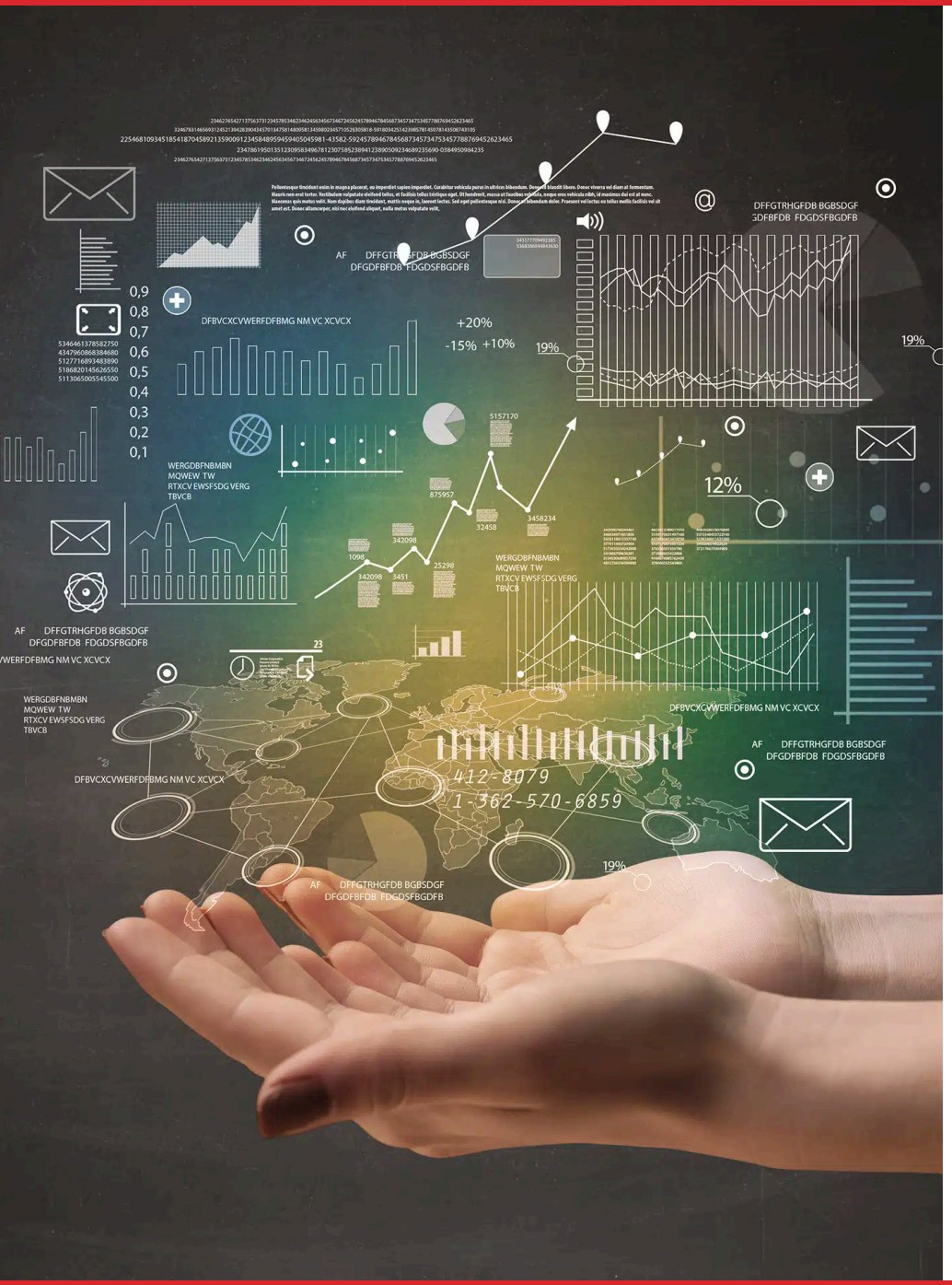
Activity: Define Business Objectives

- **In Groups**:
  - Choose a hypothetical business scenario or use your project idea.
  - **Identify** the main business objectives.
  - **Discuss** potential challenges and requirements.
- **Share** your findings with the class.

Phase 2: Data Understanding

- **Objective**: Collect initial data and become familiar with it.
- **Key Steps**:
  - **Collect Initial Data**
  - **Describe Data**
  - **Explore Data**
  - **Verify Data Quality**





Importance of Data Collection

- **Accurate and relevant data** is critical for model success.
- **Data Quality Checks**:
  - Missing values
  - Outliers
  - Data consistency
- **Tools and Techniques**:
  - Data visualization
  - Statistical analysis

Phases 3, 4, & 5: Preparation, Modeling, Evaluation

Phase 3: Data Preparation	Phase 4: Modeling	Phase 5: Evaluation
• Clean and format data for modeling. • Feature selection and engineering.	• Select modeling techniques. • Build and test models.	• Evaluate model performance. • Check if business objectives are met.

Integrating CRISP-DM with Prior Learning

- **Data Preprocessing Techniques** (from Week 2)
  - Applied during **Data Preparation**.
- **Algorithm Selection** (from Week 3)
  - Relevant in the **Modeling** phase.
- **Evaluation Metrics** (from Week 8)
  - Used in the **Evaluation** phase.

Worked Example: Applying CRISP-DM

- **Scenario**: Let's apply CRISP-DM to detect breast cancer!
- **Steps**:
  - Discuss business objectives.
  - Explore and prepare the dataset.
  - Choose and build a model.
  - Evaluate the model's performance.

Kaggle Notebook

Questions & Discussion

- Any questions about the CRISP-DM methodology?
- How can you apply CRISP-DM to your projects?
- What challenges might you face in each phase?

Next Week's agenda:
Back to Transformers! Transformers and Final Project Preparation

For next week:

I *highly* recommend you try to watch this walkthrough by Andrej Karpathy (ex-OpenAI/ex-Tesla)

Andrej Karpathy: Let's build GPT: from scratch, in code, spelled out.

Check out the Notebook on Colab

Github for video