SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

SCHOOL OF COMPUTING

21CSS303T – DATA SCIENCE

THINK-COLLABORATE - SHARE ACTIVITY - DATA SCIENCE PROCESS

Objective:
To help students understand the application of the Data Science Process in real-world scenarios by encouraging them to think critically, collaborate, and share insights on how it is used to build day-to-day applications.

Step 1: Think

- **Duration:** 3–5 minutes
- **Activity:**
    - Ask students to think of a **day-to-day application** (e.g., food delivery apps, fitness trackers, e-commerce platforms, or smart assistants).
    - Encourage them to identify how the **Data Science Process** (problem definition, data collection, processing, analysis, modeling, and deployment) is applied in building and optimizing the application.
    - Provide guiding prompts:
        - What is the primary problem the application solves?
        - What type of data does it collect?
        - How might the data be processed, analyzed, or modeled?
    - Ask students to write down their thoughts for clarity.

Step 2: Collaborate

- **Duration:** 5–7 minutes
- **Activity:**
    - Team of students need to discuss their chosen applications and ideas.
    - Encourage them to:
        - Explain the Data Science Process in the context of their chosen application.
        - Compare and contrast their ideas to identify commonalities or unique aspects.
        - Ask each other questions to refine their understanding.

- **Guiding Questions for Discussion:**
    - What similarities do you observe in how data is collected or processed?
    - How do different applications use data modeling or predictive analysis?
    - What challenges might arise in deploying these solutions?

Step 3: Share

- **Duration:** 8–10 minutes
- **Activity:**
    - Invite teams to present their ideas to the class.
    - Use the following approaches:
        - **Random Selection:** Call on teams randomly to share their discussion.
        - **Collaborative Posting:** Ask students to write their application and Data Science Process steps on a shared whiteboard or digital tool (e.g., Padlet).
        - **Grouping Themes:** Cluster similar applications (e.g., recommendation systems, predictive analytics) and discuss as a group.
- **Key Points for Sharing:**
    - Highlight diverse applications of the Data Science Process.
    - Discuss how the process adapts to different domains and challenges.

Faculty can use the below concept and ask students to pick out applications and create a poster and explain.

Example – Uber – Surge Pricing Algorithm

How UBER uses Data Science to improve their businesses?

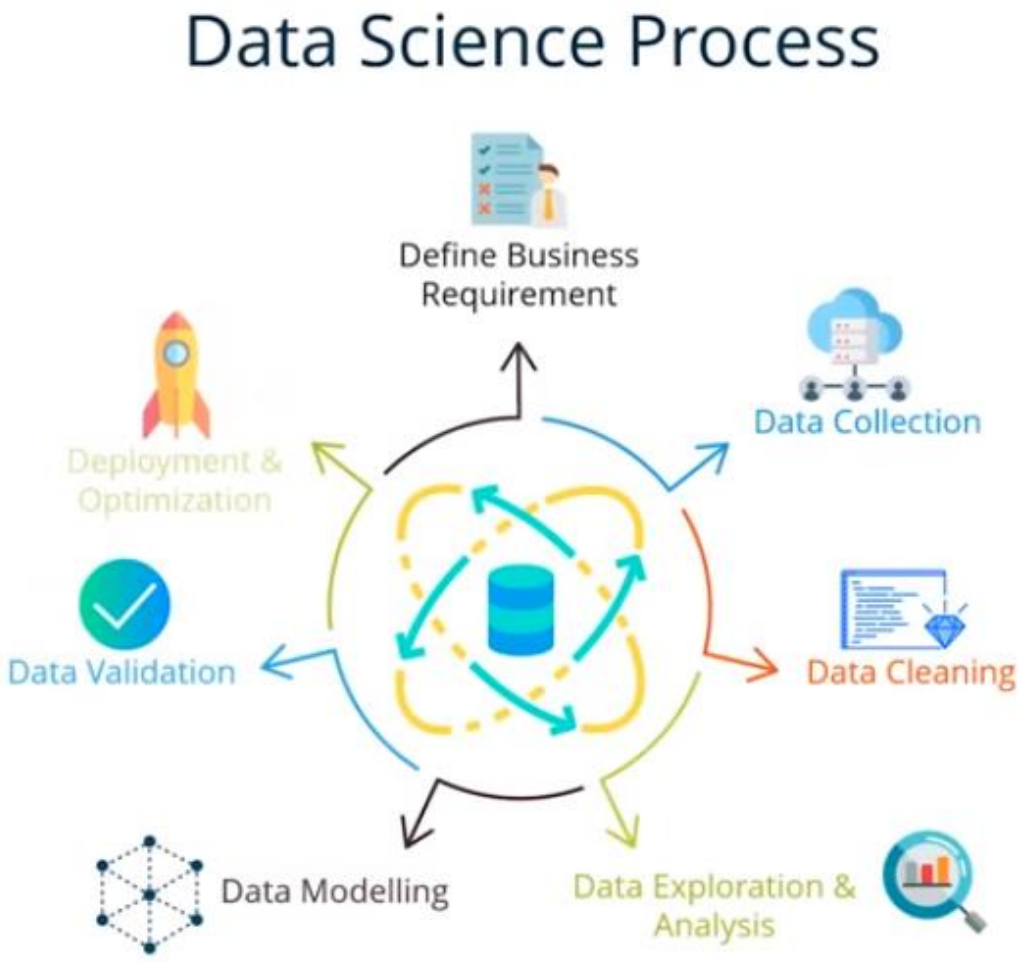


Figure 1 demonstrates the Data Science Process

Figure 2 depicts a scenario where a person is at home, potentially thinking about going to work or commuting.

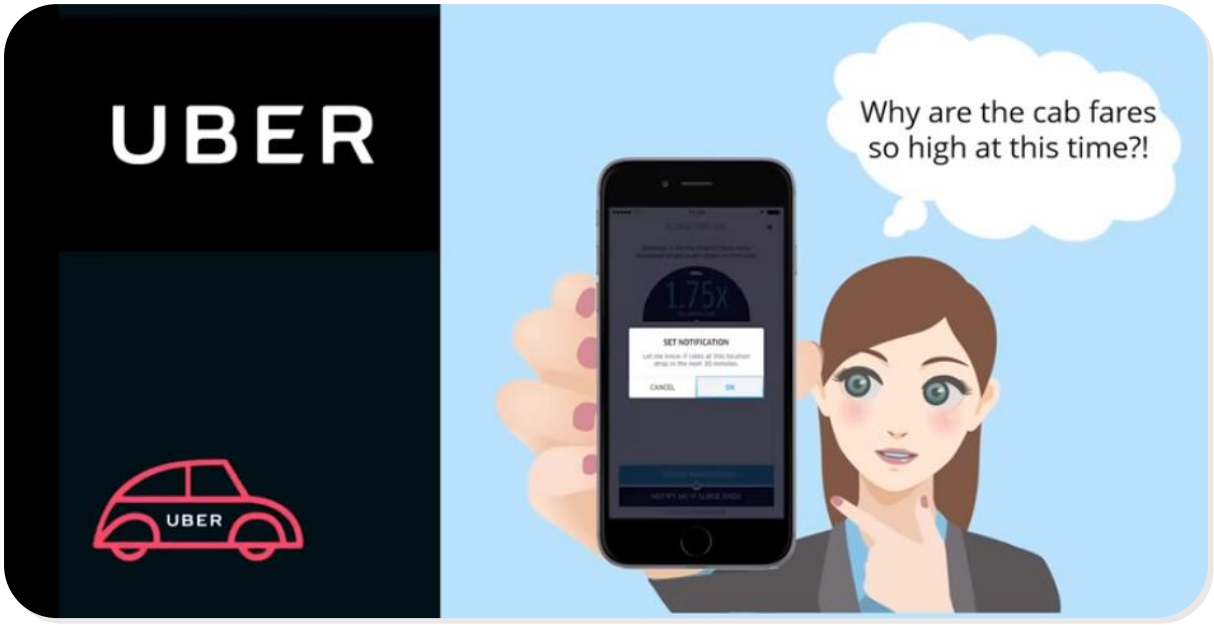


Figure 3 highlights a common question: "Why are the cab fares so high at this time?!" This scenario relates to Uber's **dynamic pricing model** and how they use the **Data Science Process** to address such issues.

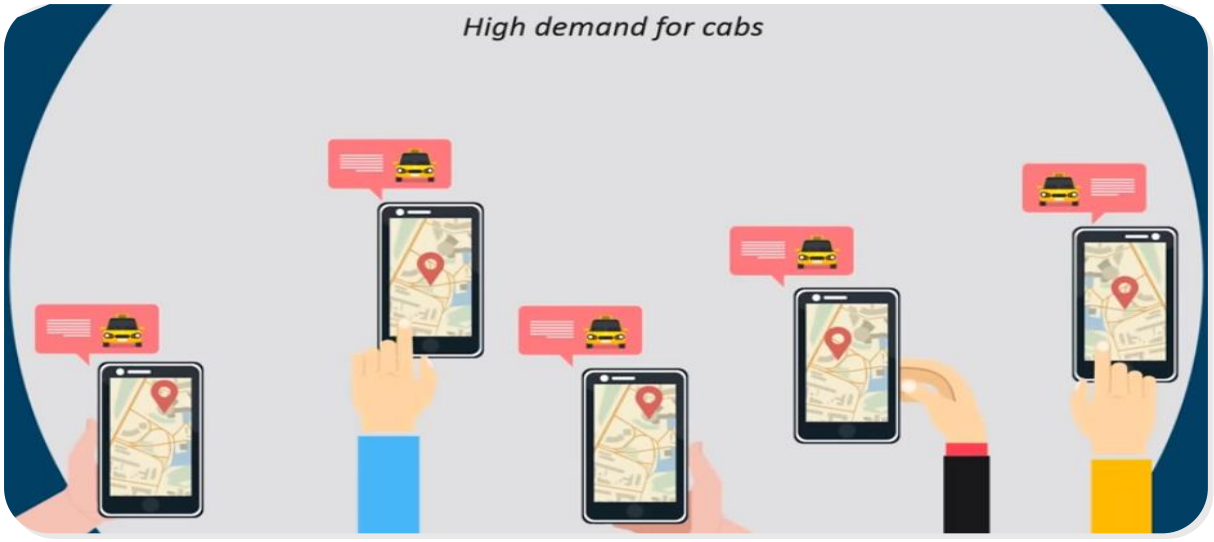


Figure 4 illustrates "High demand for cabs," a situation where multiple users are requesting rides simultaneously. Uber leverages its **dynamic pricing and resource allocation strategies** to address such scenarios.

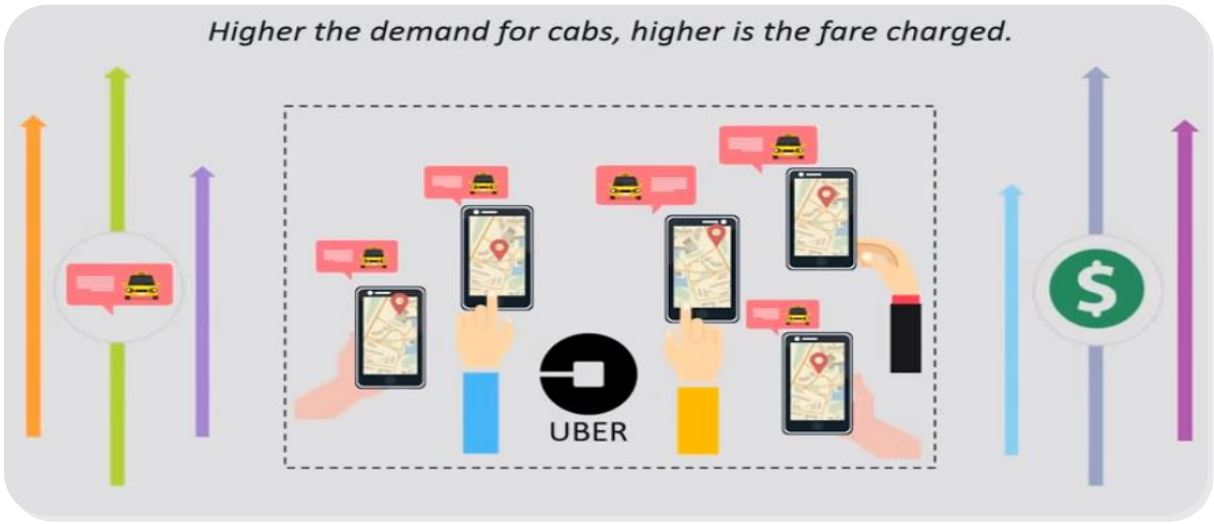


Figure 5 illustrates "Higher the demand for cabs, higher is the fare charged". Uber's dynamic pricing, also known as **surge pricing**, adjusts fares based on demand and supply.

Figure 6 illustrates that, Uber activates surge pricing algorithm by increasing fares during periods of high demand, Uber incentivizes idle or off-duty drivers to come online and accept rides. It also ensures that ride requests are fulfilled efficiently by encouraging enough drivers to meet demand.

Step 1: Business Requirements

To build a dynamic pricing model that takes effect when a lot of people in the same area are requesting rides at the same time.

Step 2: Data Collection

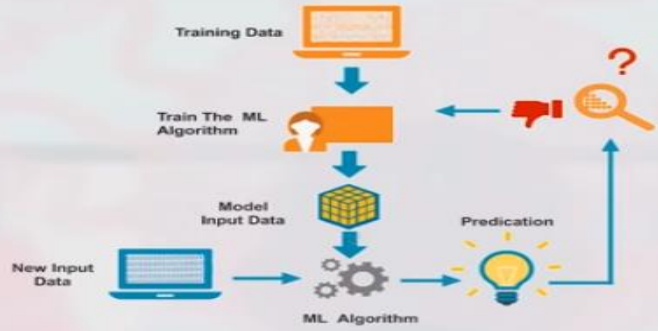
Step 3: Data Cleaning

Sometimes unnecessary data is collected, such data only increases the complexity of the problem.

Step 4: Data Exploration & Analysis

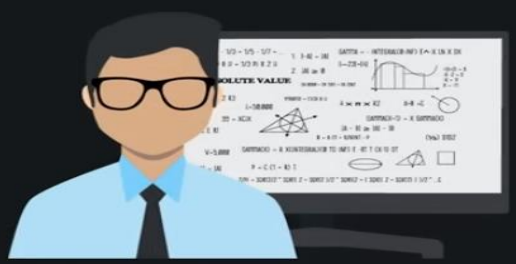
In this stage you understand the patterns in your data

Step 5: Data Modelling

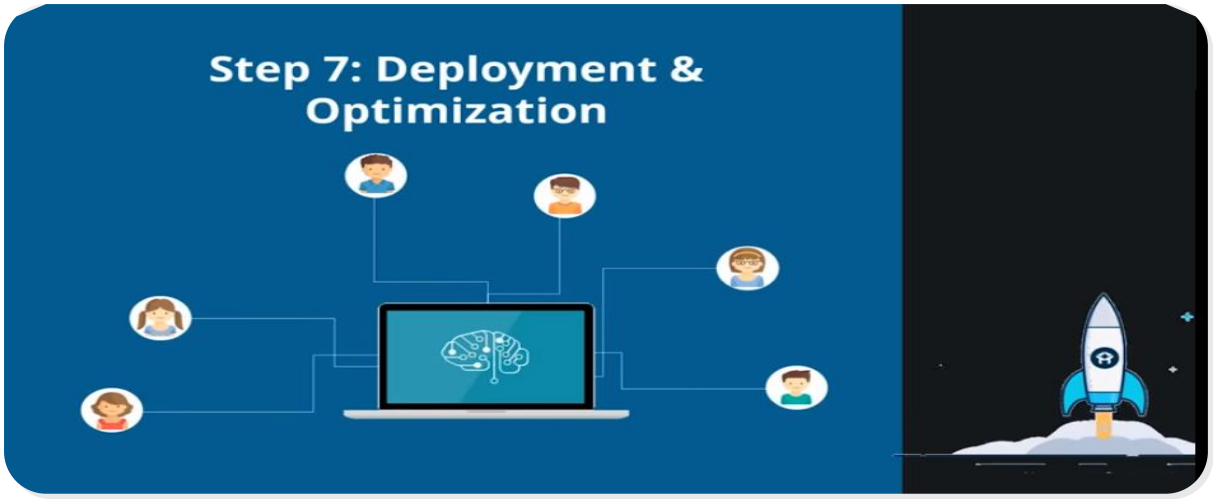


Step 6: Data Validation

New User's Data



Data Scientist at Uber


Step 7: Deployment &
Optimization