Note: Solution for the exercises will be on GitHub.

📊 Day 7: Introduction to Data Analytics

- What is data analytics?
- Types of analytics (descriptive, diagnostic, predictive, prescriptive)
- Real-world applications
- Typical data analytics workflow
- Tools you'll use (Python, Pandas, Jupyter, etc.)

🔹 1. What is Data Analytics?

Data Analytics is the science of analyzing raw data to make conclusions. It helps in decision-making by uncovering patterns, trends, and insights.

🔹 2. Types of Analytics

Type	Description	Example
Descriptive	What happened?	"Sales dropped by 10% last quarter."
Diagnostic	Why did it happen?	"Because customer churn increased."
Predictive	What is likely to happen next?	"Sales might drop again next quarter."
Prescriptive	What should we do about it?	"Offer discounts to retain customers."

🔹 3. Real-World Applications

- **Healthcare** – Predict disease outbreaks, patient diagnosis
- **Finance** – Fraud detection, risk analysis
- **Retail** – Customer segmentation, recommendation systems
- **Marketing** – Campaign effectiveness, user targeting

🔹 4. Typical Data Analytics Workflow

1. **Collect Data** – CSV, Excel, databases, APIs
2. **Clean Data** – Remove or fix missing/inconsistent values
3. **Explore Data** – Basic stats, visualizations
4. **Analyze** – Use Pandas, Numpy, statistical techniques

Note: Solution for the exercises will be on GitHub.

5. **Model** – (If needed) Machine learning
6. **Visualize** – Use Matplotlib, Seaborn, dashboards
7. **Report** – Share insights with non-technical stakeholders

✅ **Tools You'll Be Using**

Tool	Purpose
Python	Core language
Pandas	Data manipulation
NumPy	Numeric operations
Matplotlib	Visualization
Seaborn	Advanced plots
Jupyter	Interactive notebooks
scikit-learn	ML algorithms

🧠 **Mini Exercise (Simple Thinking)**

Question:
You work at an e-commerce company. Last month, the number of users dropped significantly.

Which analytics types would help you answer these?

1. How many users did we lose? → _____
2. Why did the users leave? → _____
3. Will more users leave next month? → _____
4. What can we do to stop the churn? → _____

1. Descriptive
2. Diagnostic
3. Predictive
4. Prescriptive

🔧 **Optional: Setup Environment (if not done)**

- Install Python: python.org
- Install Jupyter: pip install notebook
- Install Libraries:
- pip install pandas numpy matplotlib seaborn scikit-learn