**📊 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
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? → \_\_\_\_\_\_\_
5. Descriptive
6. Diagnostic
7. Predictive
8. Prescriptive

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

* Install Python: [python.org](https://www.python.org/)
* Install Jupyter: pip install notebook
* Install Libraries:
* pip install pandas numpy matplotlib seaborn scikit-learn