

Food Delivery Data Exploration and analysis 1 : prereads

1. Introduction to Data Analytics

- **Description:** Data Analytics is the process of inspecting, cleaning, transforming, and modeling data to discover useful insights, patterns, and support decision-making.
 - **Importance:** It helps businesses reduce risks, optimize operations, identify opportunities, and make data-driven decisions.
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2. Python vs NumPy Arrays

- **Description:** Python lists are general-purpose, while NumPy arrays are optimized for numerical computations with homogeneous data types.
 - **Importance:** NumPy arrays are **faster, more memory-efficient, and support vectorized operations**, making them essential for data science and machine learning.
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3. Dimension & Shape

- **Description:**
 - **Dimension** → Number of axes (1D, 2D, 3D, etc.) in an array.
 - **Shape** → A tuple indicating the size of the array along each axis.
 - **Importance:** Understanding dimension & shape is critical for reshaping, broadcasting, and applying mathematical operations correctly.
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4. Type Conversion in NumPy Arrays

- **Description:** NumPy allows converting data types (e.g., `int` → `float`) using `.astype()`.
 - **Importance:** Ensures compatibility during computations and prevents errors in mathematical operations (e.g., division producing floats).
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5. Indexing

- **Description:** Refers to accessing specific elements of an array using indices (e.g., `arr[0]`, `arr[2][1]`).
 - **Importance:** Enables direct access and manipulation of elements, which is the basis for data exploration and transformation.
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6. Slicing

- **Description:** Extracting a **range of elements** from an array using a `start:end:step` syntax. Example: `arr[1:5:2]`.
 - **Importance:** Helps in subsetting data without copying, saving time and memory.
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7. 2D NumPy Arrays

- **Description:** Arrays with 2 dimensions, often representing matrices or tabular data. Example: `[[1,2,3], [4,5,6]]`.
 - **Importance:** Forms the basis of linear algebra, images, and datasets in machine learning (rows = samples, columns = features).
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