📕 3. python-for-data.pdf

Title: Python for Data Analysis

1. Introduction

Python is widely used for data analysis due to its **simple syntax and powerful libraries**.

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2. Important Libraries

- **NumPy** – numerical computing

- **Pandas** – data manipulation

- **Matplotlib** – data visualization

- **Seaborn** – advanced graphs

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3. Working with Pandas

```python
import pandas as pd

data = pd.read_csv("data.csv")
print(data.head())
```

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4. Data Cleaning

- Remove null values

- Remove duplicates

- Fix data types

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5. Data Analysis Operations

- Filtering

- Sorting

- Grouping

- Aggregation

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6. Example

```
data.groupby("department")["salary"].mean()
```

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7. Visualization

```
import matplotlib.pyplot as plt
plt.bar(x, y)
plt.show()
```

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8. Applications

- Data science

- Machine learning

- Business analytics

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9. Conclusion

Python is one of the **most powerful tools for data analysis**.