

Python Programming

Unit 06 – Lecture 04: Missing Data, Aggregation, Combining,
CSV I/O

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Repository: <https://github.com/tali7c/Python-Programming>

Core Concepts
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Demo
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Quick Links

Core Concepts

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Agenda

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Learning Outcomes

- Detect and handle missing values (NaN)

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- Use aggregation (groupby) for summaries
- Combine DataFrames (concat, merge)
- Import/export CSV using `read_csv` and `to_csv`

Missing Data

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 - `dropna()`
 - `fillna(value)`

Aggregation with groupby

```
avg_by_city = df.groupby("city")["marks"].mean()
```

- Useful for summaries (average marks per city, counts per category)

Combining DataFrames

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- `pd.concat([...]):` stack rows or columns
- `pd.merge(a, b, on="key"):` SQL-like join

CSV Import/Export

```
df = pd.read_csv("data/student_scores.csv")
df.to_csv("data/cleaned.csv", index=False)
```

Demo: Missing Data + Groupby + CSV

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- Shows:
 - reading CSV
 - missing value handling
 - groupby aggregation
 - merge with another DataFrame

Checkpoint 1

Question: What does `fillna(0)` do?

Checkpoint 2

Question: When would you use merge instead of concat?

Think-Pair-Share

Discuss:

- Is it always correct to replace missing marks with 0?
Why/why not?

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- groupby provides powerful summaries
- merge joins tables using keys; concat stacks data
- CSV I/O connects Pandas with real-world datasets

Exit Question

Write one line to read a CSV file named "marks.csv" into a DataFrame.