Student Guide for Sync Session

<<Week 16: Data Science Using Python Packages – Part 2>>

This guide is your roadmap to making the most of our online session. Packed with essential tips and strategies, it's designed to keep you engaged, prepared, and ready to dive into a smooth and productive learning journey. Get ready to participate, learn, and thrive!

Session Overview

<table>
<tr><td>Session title</td><td>Exploring Data Science with Python: Seaborn Visualisation and Advanced Pandas</td></tr>
<tr><td>Session duration</td><td>3 hours</td></tr>
<tr><td>Session type</td><td>• Lectures: Seaborn visualisation and best practices for exploratory data analysis
• Case Studies: Application of pandas transformations on the Titanic dataset</td></tr>
<tr><td>Scope</td><td>This session explores how advanced Python libraries support data science workflows:
• Implement visualisation techniques using Seaborn for rich statistical graphics.
• Understand univariate, bivariate and multivariate plots for data analysis.
• Apply pandas functions to filter, transform and reshape datasets.
• Implement styled reports using pandas Styler to highlight patterns.
• Understand practical data exploration using real datasets like Titanic.</td></tr>
<tr><td>Learning objectives</td><td>
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<tr><th>Objective</th><th>Core capability</th></tr>
<tr><td>Understand Seaborn and its advantages</td><td>Creating effective statistical visualisations</td></tr>
<tr><td>Apply univariate and multivariate visualisations</td><td>Data exploration using plots</td></tr>
<tr><td>Perform data transformations in pandas</td><td>Handling numeric, string and datetime data</td></tr>
<tr><td>Reshape datasets using stack and unstack</td><td>Managing hierarchical indexing</td></tr>
<tr><td>Build styled reports using pandas Styler</td><td>Communicating insights clearly</td></tr>
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<tr><td>Software/Tools</td><td>• Python (Seaborn, Pandas, NumPy, Matplotlib)
• IDE: Jupyter Notebook</td></tr>
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	• Dataset: Titanic dataset • Presentation Tool: PowerPoint

Pro tips for success:

- **Ask Bold Questions:** Ask Questions Actively: Don't hesitate to ask if a chart or syntax feels unclear.
- **Experiment Openly:** Try altering plots, styles and filters to observe changes.
- **Think Visually:** Focus on how your plots help explain insights clearly.

Session Details

Topic	A glimpse	Insight / Actionable
Introduction	Overview of session goals and tools	Connect today's focus to past EDA knowledge
Seaborn Overview	Why Seaborn is used for visualisation	Load the Titanic dataset and explore plot options
Univariate Plots	Histograms and count plots	Use to understand age, sex or fare distributions
Bivariate Plots	Scatter, bar and box plots	Compare variables like age vs fare or class vs fare
Multivariate Plots	Heatmaps and pair plots	Discover patterns using more than two variables
Faceted Visualisations	FacetGrid for multi-category views	Segment plots by sex, class, or survival outcome
Relational Plots	Use relplot and lineplot	See how values change across categories
Customisation	Themes, colour palettes, labels and styling	Improve readability and visual appeal
Best Practices	Tips for plot design and clarity	Avoid clutter, focus on legibility and storytelling
Advanced Pandas	Use query, filter, apply and transform	Clean and analyse data with less code

Stack and Unstack	Reshape datasets using index levels	Switch data views for flexible summaries
String and Regex	Extract patterns or clean text fields	Pull titles from names or format labels
DateTime Handling	Add and group by dates	Generate daily summaries and trends
Styled Reports	Highlight values with Styler	Use gradients or formats for clear presentation
Wrap-Up & Q&A	Recap all techniques and field questions	Think about which tool helps your current project the most

Post-Session Activities

Reflection challenge	Which function or plot do you think you'll apply first, and why?
Explore more	**Practise** Seaborn and pandas techniques with different datasets. **Create** your own styled output using pandas Styler. **Share** a visual you created in the next session or group discussion**.**
Get inspired	Think about how visual tools help analysts turn complex data into clear stories that drive decisions.
The journey ahead	Next, we move toward building predictive models. Understanding the data visually prepares you to choose the right algorithm.