

## Student Guide for Sync Session

### <<Week 18: Storytelling with Data>>

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

<b>Session title</b>	Storytelling with Data	
<b>Session duration</b>	3 hours	
<b>Session type</b>	<ul style="list-style-type: none"> <li><b>Lectures:</b> Understanding the importance of storytelling in analytics and identifying key storytelling frameworks.</li> <li><b>Case Studies:</b> Applying statistical storytelling techniques to real-world business data scenarios.</li> </ul>	
<b>Scope</b>	This session emphasises the value of storytelling in data-driven environments. It builds foundational knowledge of inferential statistics concepts like: <ul style="list-style-type: none"> <li>Sampling distributions</li> <li>The central limit theorem</li> <li>Hypothesis testing</li> </ul>	
<b>Learning objectives</b>	<b>Objective</b>	<b>Core capability</b>
	Explain the role of storytelling in analytics communication	Ability to simplify technical information
	Differentiate between population and sample, and interpret sampling distributions	Understanding statistical foundations
	Apply Central Limit Theorem and Hypothesis Testing concepts	Analytical reasoning and statistical inference
	Use confidence intervals and p-values to support data stories	Data interpretation and communication
	Develop visualisations that enhance storytelling	Visualisation and insight communication
<b>Software/Tools</b>	<ul style="list-style-type: none"> <li>Python (Libraries: NumPy, Matplotlib, SciPy)</li> <li>IDE: Jupyter Notebook</li> <li>Tool: PowerPoint</li> </ul>	

### Pro tips for success:

- Ask Bold Questions:** Wondering how a concept applies to your work? Just ask!
- Be Hands-On:** The best way to learn stats is by running the code and watching the graphs evolve.
- Collaborate:** Group activities and breakout rooms are your space to learn from peers. Share!

## Session Details

Topic	A glimpse	Insight / Actionable
Introduction	Understand why storytelling matters in analytics	Think about your favorite data-driven story (e.g., Spotify Wrapped)
Role of Storytelling	Discover how narratives influence business decisions	Consider how good visuals and insights impacted decisions you've seen
Population vs Sample	Grasp key differences and definitions	Use polling examples to visualise how samples represent populations
Sampling Distribution	Learn how repeated samples help estimate truth	Think of it as repeated experiments leading to stable averages
Central Limit Theorem (CLT)	Understand how sample means behave	Use simulation plots to observe convergence to normal
CLT Applications	Apply CLT to build intervals and test hypotheses	Relate it to real-world sampling decisions (e.g., surveys)
Hands-on CLT Practice	Simulate CLT using Python	Visualise how sample size impacts variability
Hypothesis Testing Intro	Learn about null vs alternative hypotheses and p-values	Reflect on how statistical tests impact decisions
Type I & II Errors	Differentiate error types in decisions	Consider risk trade-offs in hiring or medical testing
Confidence Intervals	Estimate a range where population values lie	Practice calculating CI using provided Python function
Hands-on Hypothesis Test	Run t-tests and interpret results	Understand how alpha levels impact conclusions
Effective Storytelling Frameworks	Use frameworks to turn insights into stories	Apply Hero's Journey or 3-act structures to your findings
Visualisations for Storytelling	Enhance messages with impactful visuals	Review chart design and practice improving visual appeal
Hands-on Visualisation Fix	Work on correcting a bad visual	Collaborate in breakout rooms to sharpen your eye for design
Misinterpretation Risks	Avoid common data storytelling pitfalls	Be cautious of cherry-picking and misused p-values
Case Study Walkthrough	Explore a real data story from problem to decision	Connect charts, CI, and narrative to business outcomes
Open Discussion	Reflect on your learnings and applications	Share your own ideas or use cases from work
Recap and Thank You	Summarise key ideas and takeaways	Prepare to apply concepts in your next data story

## Post-Session Activities

Reflection challenge	Which storytelling technique resonated with you the most?
Explore more	<ul style="list-style-type: none"> <li>• <b>Read:</b> Storytelling with Data by Cole Nussbaumer Knafl</li> <li>• <b>Watch:</b> TED Talk – “The Beauty of Data Visualisation” by David McCandless</li> <li>• <b>Try:</b> Make a story out of your own project data using CI and visual tools</li> </ul>
Get inspired	Did you know data stories have helped brands redesign products, win elections, and launch billion-dollar campaigns?
The journey ahead	Deep dive into advanced inference and machine learning storytelling techniques.

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