



Université  
de Technologie  
Tarbes  
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THE COMPLETE GUIDE TO

# INFERENTIAL STATISTICS

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## </SECTION 1>

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# INTRODUCTION

# SECTION OUTLINE



- ☐ Lecture objectives
- ☐ The world of statistical tests
- ☐ Importance of statistical tests





# LECTURE OBJECTIVES

27/09/2024

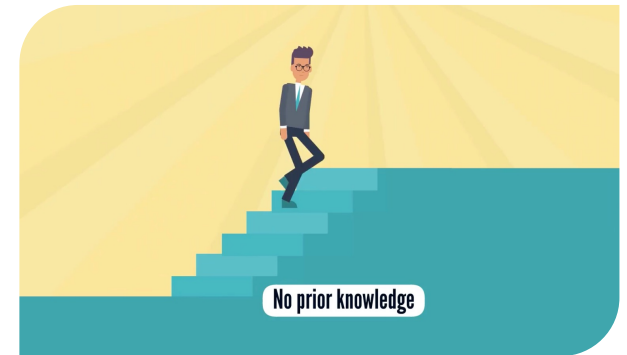
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# TARGETED OBJECTIVES

- ✓ Equip you with the **knowledge** and **skills** to transform your sales and marketing strategies, or design your experiments.
- ✓ Learn to discover **critical insights**, make **data-driven decisions**, and **enhance your approach** effectively.
- ✓ Develop the confidence to present and clearly **explain** your results to a professional audience.
- ➔ Empower you with the ability to
  - ask the **right questions**,
  - **interpret** the results,
  - and get **hands-on experience** running statistical tests.

# PRE-REQUISITES

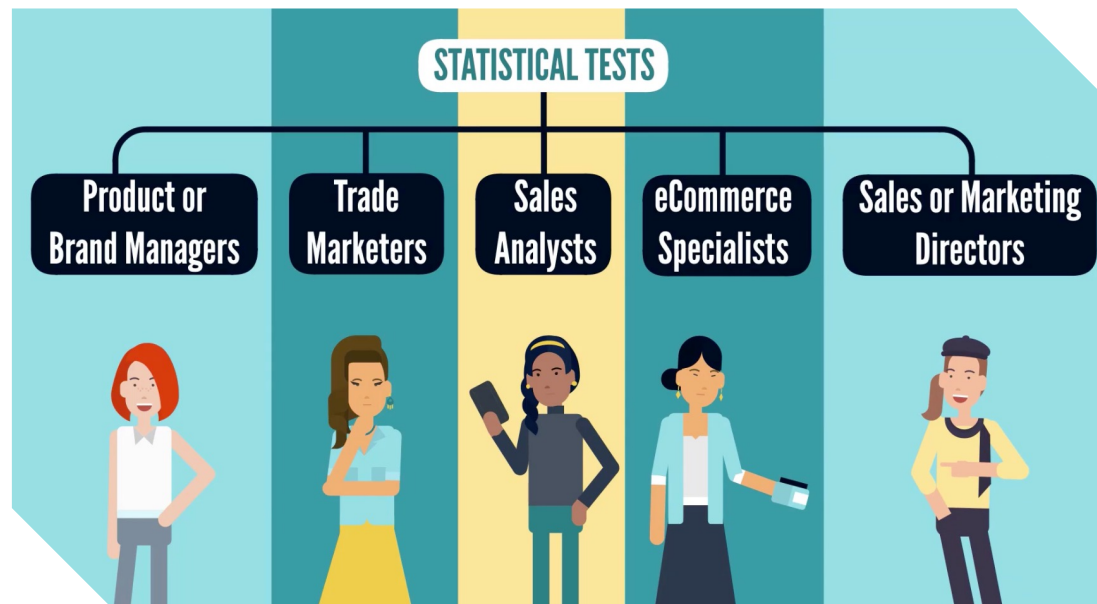
- ✓ No **prior statistical knowledge** is required.
- ✓ We'll start from the **basics**, and **gradually** build your understanding, ensuring you gain a solid foundation in statistical concepts.



- ✓ The goal is to demystify common myths:
  - showing statistics is more than just **number-crunching**,
  - proving that it is **accessible** without needing to be a math genius,
  - showcasing its true value through **practical applications** of recognised methods.

# RESEARCH QUESTIONS FACED BY PRODUCT

- ✓ Real-life **scenarios** and showcase of **actual decision-making** processes in sales and marketing.
- ✓ Empowering to make data-driven decisions and contribute to **evidence-based** research.





# THE WORLD OF STATISTICAL TESTS

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# STATISTICAL TESTS

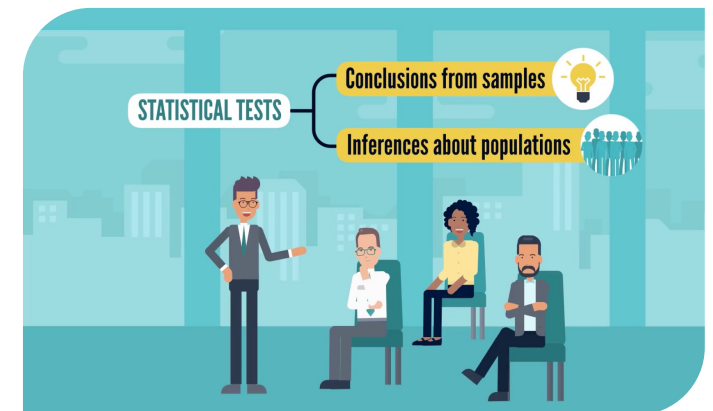
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- ✓ Statistics is the backbone of modern science and is critical in making informed business decisions **based on data**.
- ✓ Statistical tests are essential tools to assess the significance of observed **patterns or relationships** in data,
  - Enabling researchers, analysts, and decision-makers to make informed conclusions and decisions **based on empirical evidence**.

# STATISTICAL TESTS

In a world overflowing with data, statistical tests provide a **systematic framework** to

- ✓ draw reliable **conclusions** from samples,
- ✓ and make **inferences** about populations.



# STATISTICAL TESTS

Statistical tests are **omnipresent** in everyday life:

- *public opinion polls, research surveys, weather forecasting, quality control and manufacturing, sports analytics, and many other fields rely on statistical methods to inform decision-making and help predict future outcomes.*



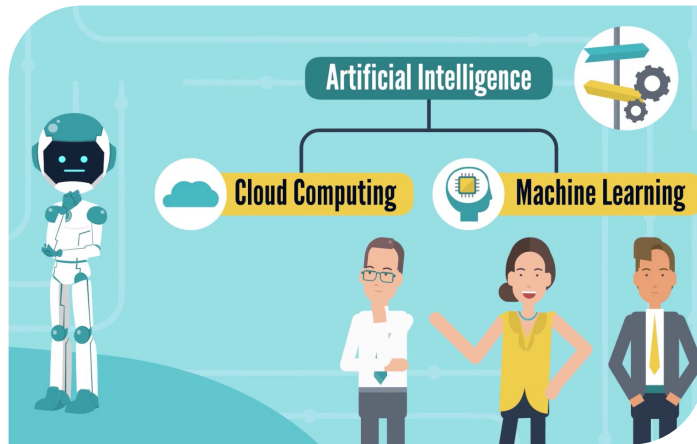


# IMPORTANCE OF STATISTICAL TESTS

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# AUTOMATED DECISIONS IN THE DIGITAL ERA



- ✓ As artificial intelligence and associated technologies like cloud computing and machine learning evolve, **decision-making** will increasingly become **automated**.

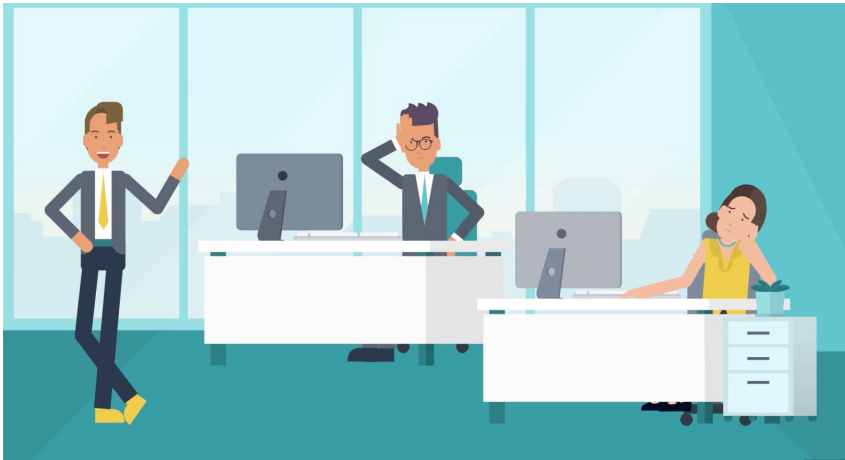
➔ It's crucial for professionals, including analysts, domain experts, and decision-makers, to **understand how** these machines generate predictions, scores, and recommendations.

# UNINFORMED LEADER ABOUT DATA

- ✓ In the current digital era, a leader entirely **uninformed** about the data, techniques, and analytics used to generate recommendations → would not probably be an **effective decision-maker**.



# INFORMED LEADER ABOUT DATA



- ✓ A leader with a **working knowledge of statistics** empowers analysts and decision-makers
  - to independently **evaluate the quality** of studies,
  - making **informed judgments** about their credibility.
  
- ✓ He can also equip them to ask **pertinent questions**, when necessary.

# UNDERSTANDING STATISTICS

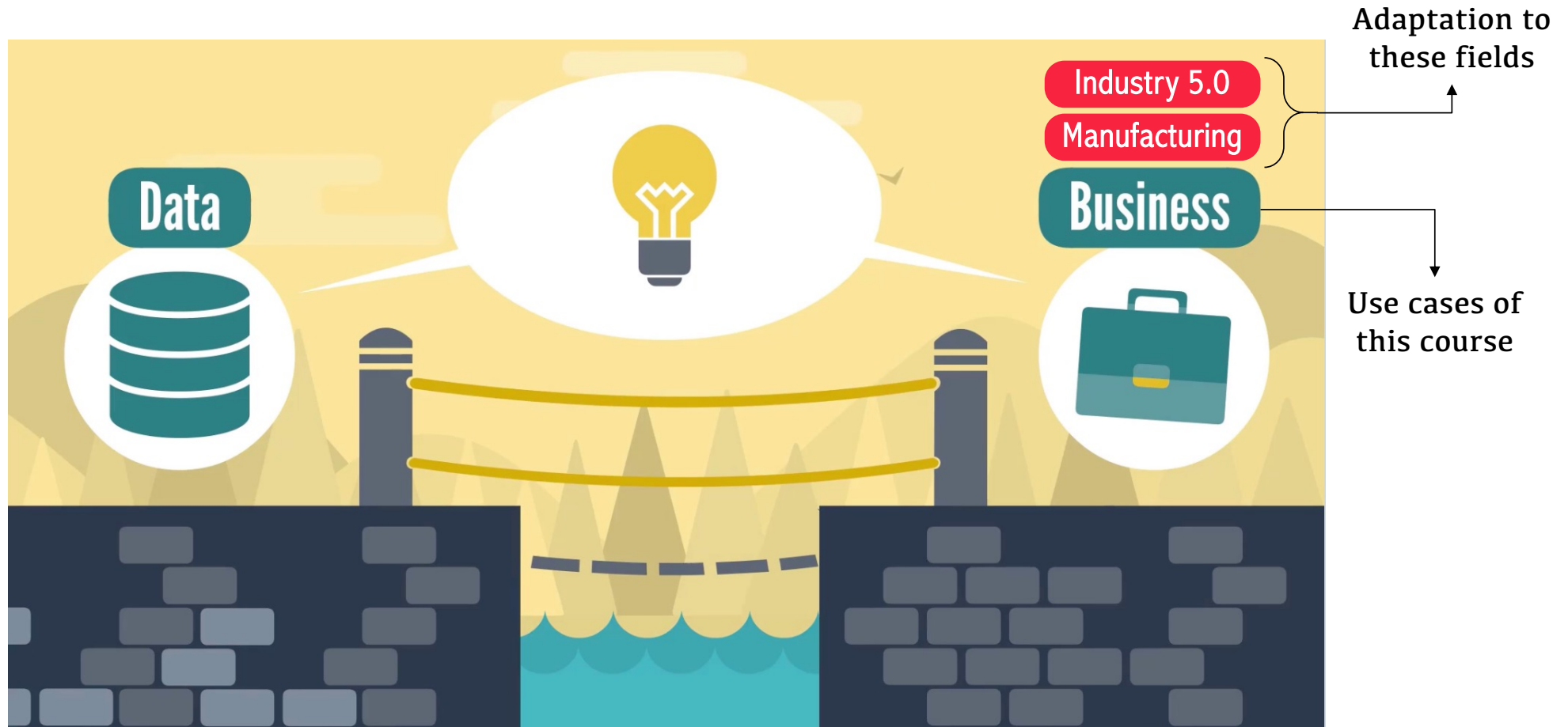


- ✓ Understanding statistics gives individuals the **confidence to discern** between insightful and less relevant questions, reinforcing that no question is foolish.

➔ With such self-confidence, you also become a **coveted interlocutor** for data scientists who may not have your business domain experience.



# BESIDES THE FIELD OF BUSINESS



# WHICH TECHNOLOGIES?



- ✓ Choice for this course: Python
- **open source** programming language (free & user friendly),
  - supports a **broad spectrum of tasks** (from data preparation to visualization and analysis),
  - fulfilling **most statistical** needs,
  - the **prevalent language** in data science.