Tips & Tricks in Research and Data Processing

MS Excel vs. Tableau, SPSS vs. Jamovi

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Erasmus+ Small-Scale Partnership Project No. 2024-2-LV01-KA210-VET-000280127 — Improving VET programmes in management and administration by introducing and applying artificial intelligence, digital resource tools and their alternatives in the learning process.

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Research & Data Processing: Digital and AI Tools

A structured overview of the digital tools used at each stage of the research process — from data collection to final presentation.

Stage	Task	Tool	Application
1. Data Collection	Interviews, surveys, audio recordings	Google Forms / MS Forms	Data gathering
2. Qualitative Data	Interview transcription & analysis	**Sonix**	Audio → text, structuring interviews
3. Quantitative Analysis	Statistical data processing	**Jamovi** / MS Excel / SPSS / R	Statistics, correlations, comparisons
4. Data Visualization	Charts, dashboards, interpretation	**Tableau** / MS Excel	Interactive visualizations
5. Text Quality	Academic language & grammar	**Grammarly**	Grammar, style, academic English
6. Presenting Results	Presentations & visual content	Canva / Gamma / PowerPoint	Research result visualization

CHAPTER 1

Jamovi — Statistical Analysis Tool

Jamovi is a **free statistics program** (**jamovi.org/cloud.html**) designed for data analysis and research. It is especially suited for students and researchers who want to perform data analysis without complex programming.

Descriptive Statistics

Mean, median, mode, standard deviation, min/max

Correlations

Pearson and Spearman correlation analysis

t-tests & ANOVA

Comparing group means

Regression

Factor influence and prediction analysis

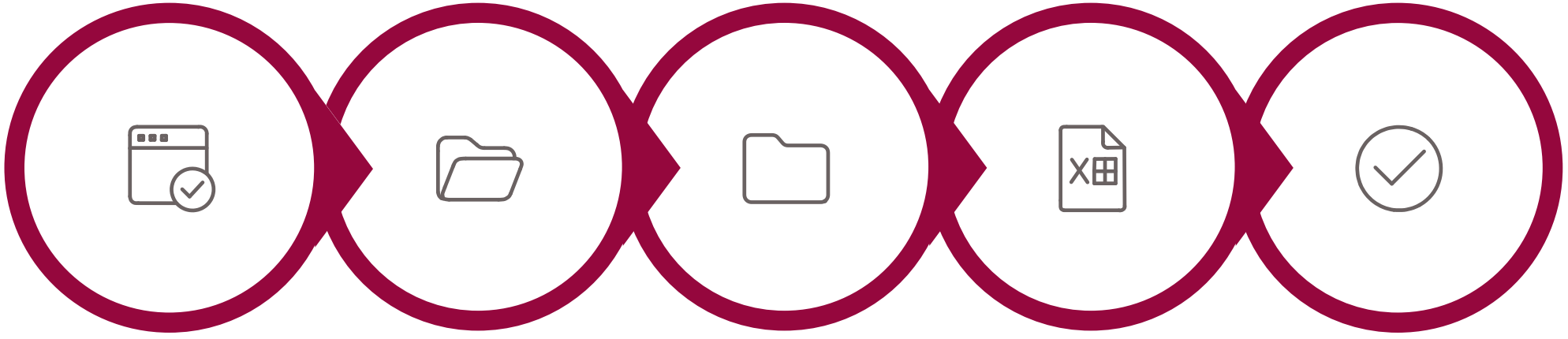


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JAMOVI

Uploading Data to Jamovi

To import data into Jamovi, follow these steps in sequence:



After loading data, always verify that the data has been imported correctly and that all columns are properly named and formatted.

JAMOVI

Data Verification After Import

After importing, it is essential to carefully check your data before beginning statistical analysis.

✓ Columns are correct

Check that each column has the right name and contains the expected data.

✓ No empty cells

Empty cells can distort statistical results and cause errors in analysis.

✓ Numbers not imported as text

If numbers are in text format, Jamovi cannot perform mathematical calculations.

✓ No erroneous symbols

Check that the data contains no unwanted characters or formatting errors.

⚠ **Important:** Incorrect data produces incorrect statistical results.

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JAMOVI

Defining Variables in Jamovi

Click on a column name to open variable settings. Set the **Data type** and **Measure type** according to your data.

Data Type Examples

Data Type	Meaning
Text	Text data
Integer	Whole numbers
Decimal	Decimal numbers
Date	Dates

Measure Type Examples

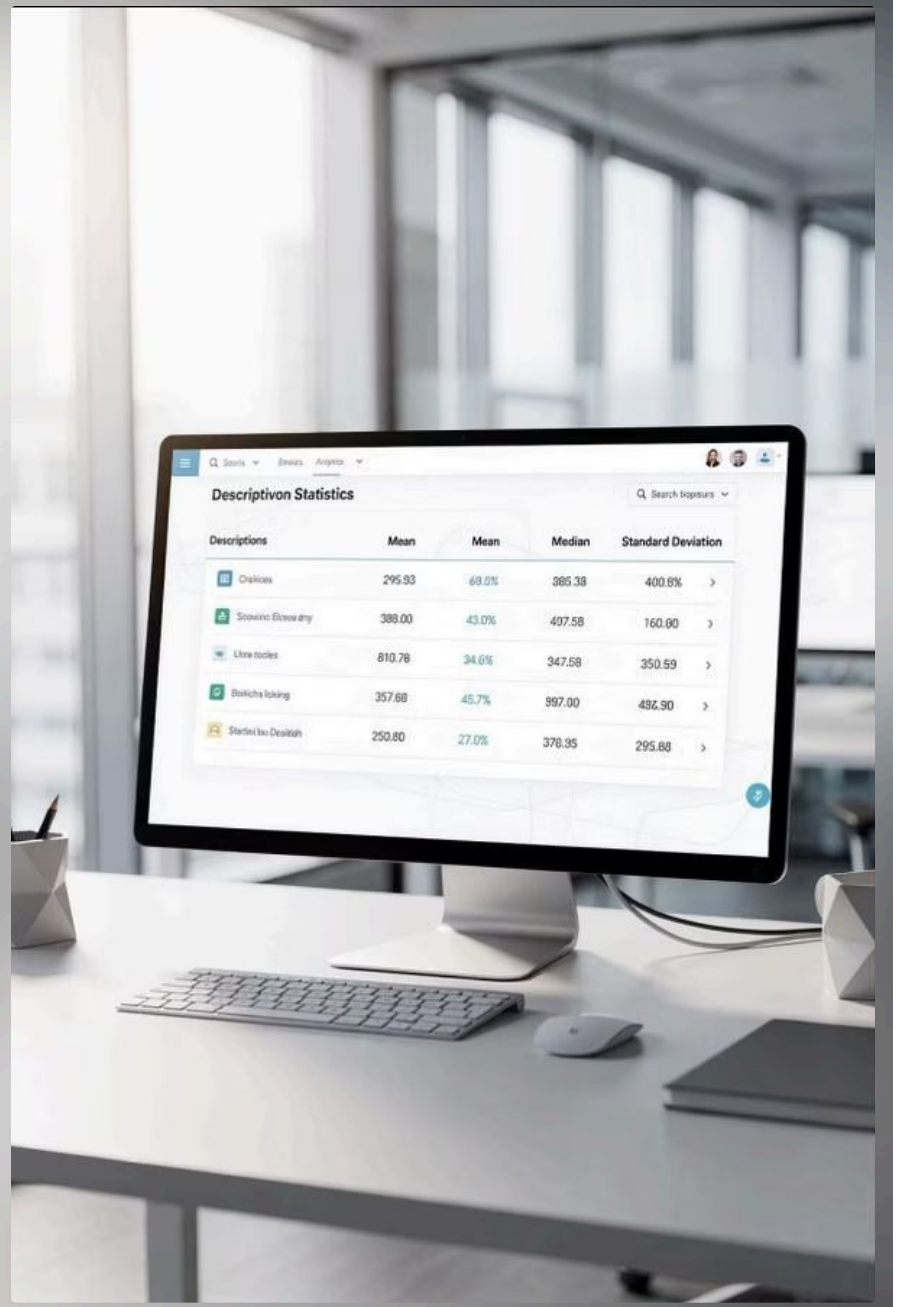
Measure Type	Meaning
Nominal	Categories without order
Ordinal	Categories with order
Continuous	Continuous numeric data
ID	Identifiers / serial numbers

Key Variable Examples

Variable	Data Type	Measure Type
Gender	Text	Nominal
Age	Integer	Continuous
Likert scale	Integer	Ordinal
Grade	Decimal	Continuous

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JAMOVI

Descriptive Statistics

Descriptive statistics calculate the basic indicators of your data. To obtain key statistical measures in Jamovi, follow this path:

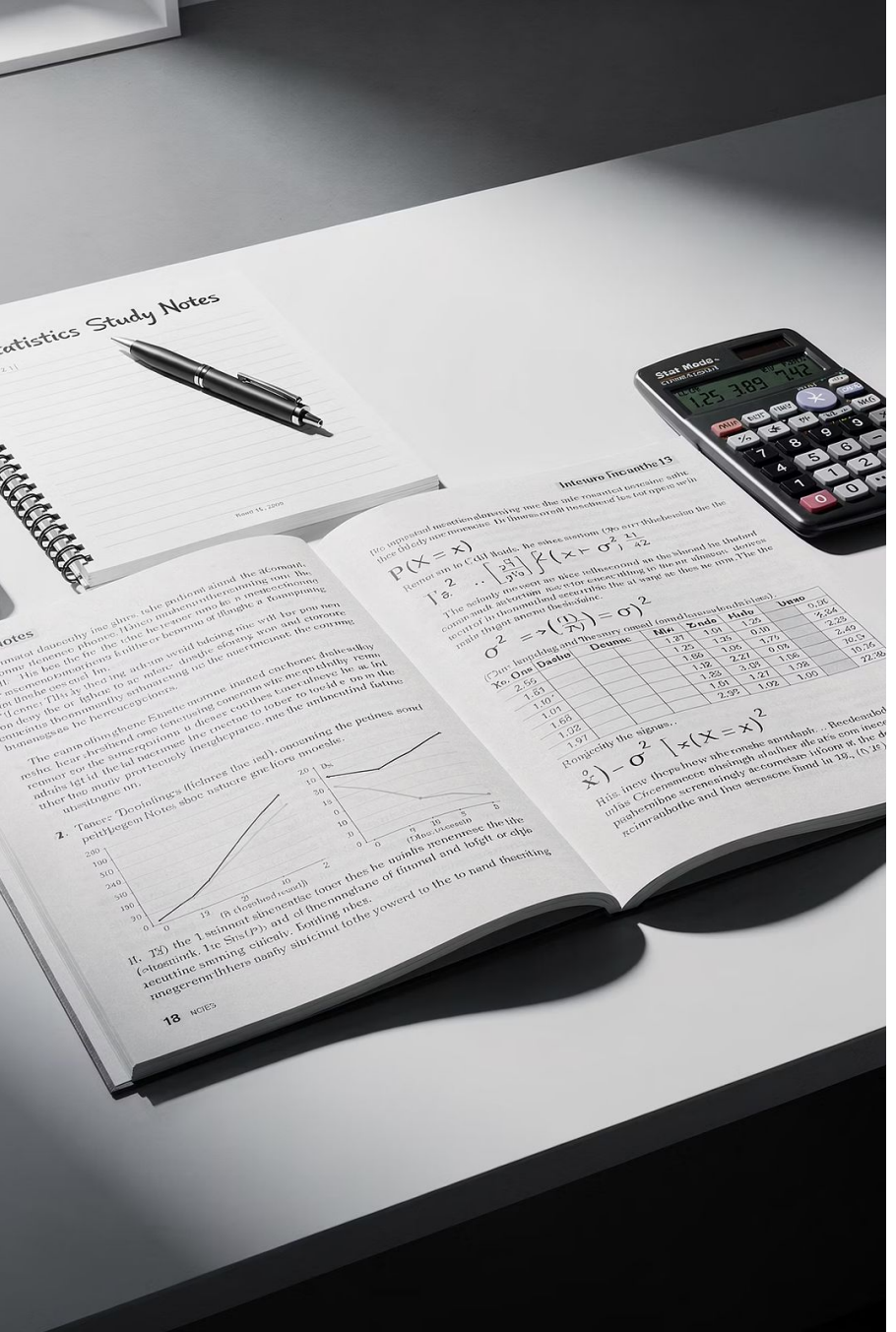


Analyses **Exploration** **Descriptives**

In this section you can calculate: **mean, median, mode, standard deviation, maximum and minimum values.**

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JAMOVI

Mean and Median

Mean (Average)

Shows the average level in a group. Calculated by dividing the sum of all values by the number of observations.

Example: Average grade = 7.8

Median

Shows the central value in a sorted data series. Less sensitive to very large or small values — therefore often used when data contains extreme values.

Example: Median = 8

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JAMOVI

Mode and Standard Deviation

Mode

Shows the most frequently occurring value in a dataset.

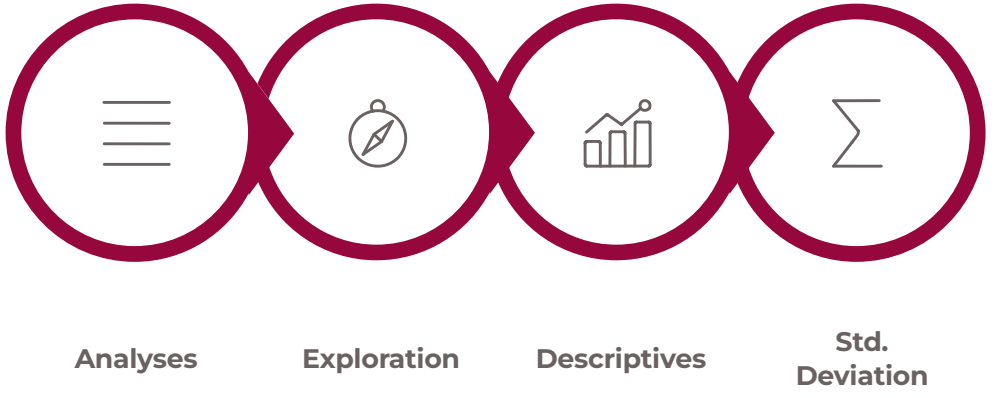
Example: If the grade "9" appears most often, then mode = 9.

Standard Deviation (SD)

Shows how much the data differs from the mean value.

- **Small SD:** Data values are similar to each other
- **Large SD:** Data values are very different

How to Calculate Standard Deviation in Jamovi



After checking the box, Jamovi will automatically calculate the standard deviation and display it in the results table.

JAMOVI

Correlation Matrix

The correlation matrix determines relationships between variables. To analyze relationships in Jamovi: **Analyses → Regression → Correlation Matrix**

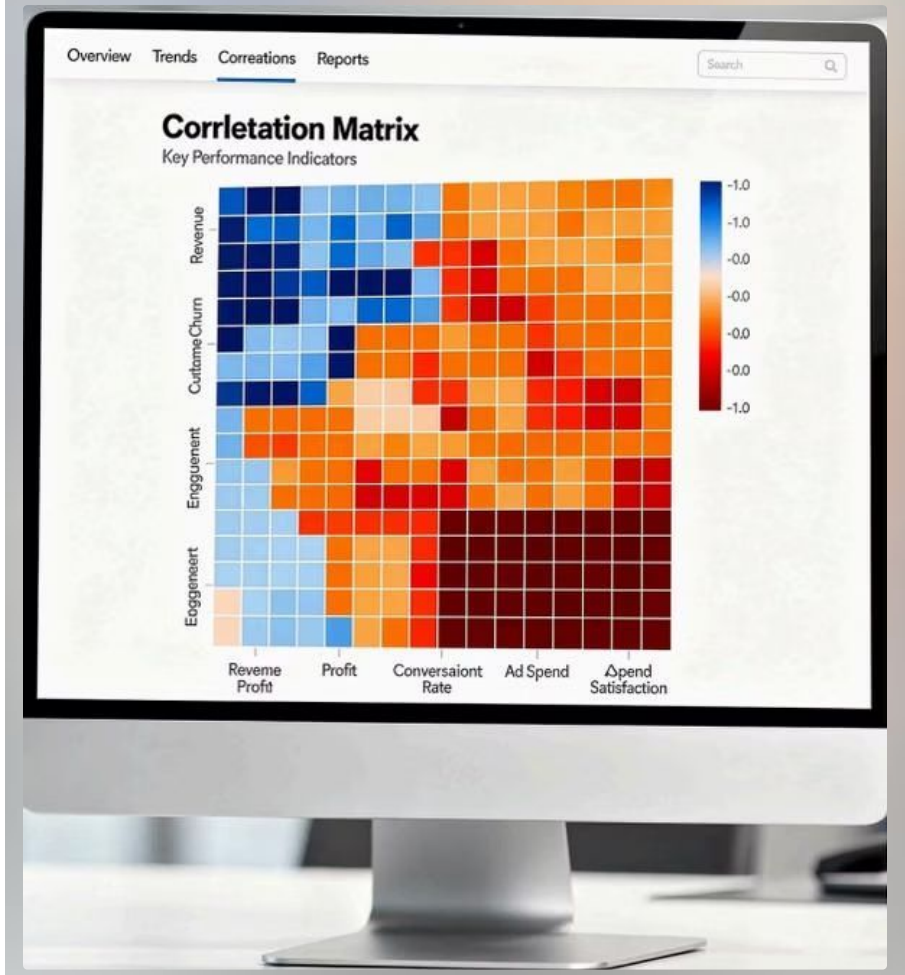
Pearson Correlation

Relationship analysis between **Continuous** data. Used for continuous data with a normal distribution.

Spearman Correlation

Relationship analysis for **Ordinal** and Likert scale data. Spearman is frequently used in student surveys.

Correlation shows whether two variables are mutually related and in which direction that relationship manifests.



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JAMOVI

Types of Correlation and p-value



Positive Correlation

As one indicator increases, the other also increases. **Example:** Higher motivation → higher grades.



Negative Correlation

As one indicator increases, the other decreases. **Example:** Higher stress → lower satisfaction with studies.



p-value

Determines statistical significance. **p < 0.05** = statistically significant result. **p > 0.05** = insufficient evidence for significance.

Correlation Value	Meaning
+1	Very strong positive correlation
+0.5 to +0.9	Positive correlation
~0	No correlation
-0.5 to -0.9	Negative correlation
-1	Very strong negative correlation

JAMOVI

Cronbach's Alpha — Survey Reliability

Cronbach's Alpha shows survey reliability and whether Likert questions "go together." It is the standard indicator used to assess the internal consistency of a survey.

Alpha ≥ 0.9

Excellent reliability

Alpha ≥ 0.8

Good reliability

Alpha ≥ 0.7

Acceptable reliability

⚠ If Alpha is below 0.7, the survey's reliability is questionable and the questions may not be mutually related.

JAMOVI

Regression — Factor Influence & Prediction

Regression is used to determine which factors influence an outcome. Path in Jamovi:
Analyses → Regression → Linear Regression

01

Goal

Determine which factors influence the dependent variable

02

Example

Do motivation and sleep affect academic performance?

03

Result

Regression allows not only identifying relationships but also predicting outcomes based on known factors.



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Charts in Jamovi

Jamovi offers various chart types to help visualize and interpret data.



Histogram

Shows data distribution and frequency by intervals.



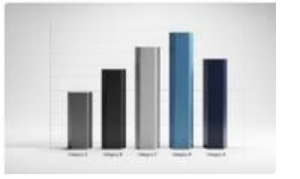
Scatter Plot

Visualizes the relationship between two variables.



Boxplot

Shows data distribution, median, and extreme values.



Bar Chart

Compares categories or groups visually.

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JAMOVI

Key Calculations in Research

Analysis	What It Shows	When to Use
Mean	Average level in a group	Almost all studies
Median	Central value	When data is not evenly distributed
Mode	Most popular answer	Surveys
Standard Deviation	How much data differs from the mean	Understanding data spread
Min / Max	Lowest and highest value	Data verification
Frequencies / %	How often answers appear	Categorical data / surveys
Correlation	Relationship between variables	Relationship analysis
t-test	Comparing two groups	Women vs. men
ANOVA	Comparing multiple groups	3+ groups
Regression	Predicts influence	Factor analysis
Cronbach's Alpha	Survey reliability	Likert scales
Normality test	Whether data is normally distributed	Before Pearson/tests

JAMOVI

Common Mistakes and Drawing Conclusions

Most Common Student Mistakes

- Incorrect variable types
- Text instead of numbers
- Empty cells in data
- Incorrectly chosen statistical method
- Not interpreting results

What to Write in Conclusions?

Conclusions should describe:

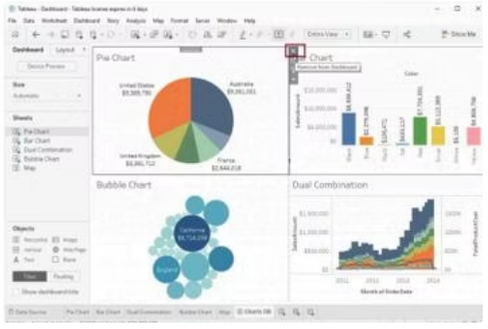
- What the results mean in the research context
- Whether the hypothesis was confirmed or rejected
- What the practical conclusion is

⚠ **Important:** It is not enough to just insert tables — results must be interpreted and explained!

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CHAPTER 2

Tableau — Data Visualization Tool



In this lesson you will get acquainted with Tableau — one of the world's leading data visualization tools. By the end of the lesson, you will be able to create your own free Tableau Public account.

01

Introduction to Tableau

Understand the tool's essence, operating principles, and main use cases.

02

Tableau Types

Understand the different Tableau products — Desktop, Public, Server, etc.

03

Tableau Alternatives

Compare Tableau with other popular tools: MS Excel and Power BI.

04

Creating a Tableau Public Account

Step-by-step creation of a free Tableau Public account to start working online.

TABLEAU

What IS Tableau?

Tableau is a **data visualization tool** that transforms data into clear, interactive charts and dashboard solutions. It helps users easily explore information, discover patterns and trends, and make **data-driven decisions** — without programming knowledge.

What Tableau is NOT:

Not a Data Source

Tableau does not store data — it visualizes it.

Not a Programming Tool

It does not require writing code.

Not a Statistics Package

Not designed for complex statistical modeling like SPSS or R.

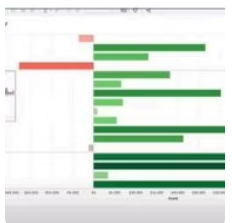


Tableau's **main goal is to analyze and understand data**, not just make it visually appealing.

TABLEAU

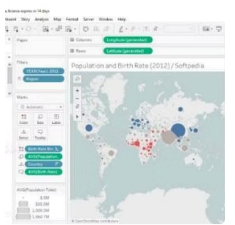
Tableau Advantages

Why is Tableau the choice of professionals worldwide? The tool combines powerful analytics with intuitive usability, allowing any user to work with data efficiently.



User-Friendly

Intuitive drag-and-drop principle — no programming knowledge required.



Interactive Dashboards

Create dynamic visual reports that allow users to filter and explore data themselves.



Trends & Insights

Helps identify trends and build data narratives that support decision-making.



Data Transformation

Allows analyzing, cleaning, and transforming data — directly within the Tableau environment.

TABLEAU

Tableau Products and Types

Tableau offers various products designed for different use cases — from individual learning to enterprise-scale data sharing. In this lesson, we will work with **Tableau Public** — the free version ideal for learning and publicly sharing work.

Product	Function	Main Purpose
Tableau Desktop	Main tool for data analysis and visualization	Build dashboards and analyze data
Tableau Public	Free Tableau Desktop version	Learn and publicly share work online
Tableau Server	Internal data sharing platform	Secure collaboration within an organization
Tableau Online	Cloud version of Tableau Server	Access and share dashboards from anywhere
Tableau Prep	Data cleaning and preparation tool	Combine, filter, and transform data
Tableau Mobile	App for viewing dashboards	Access data and analytics on mobile devices

TABLEAU

Tableau vs. Alternatives

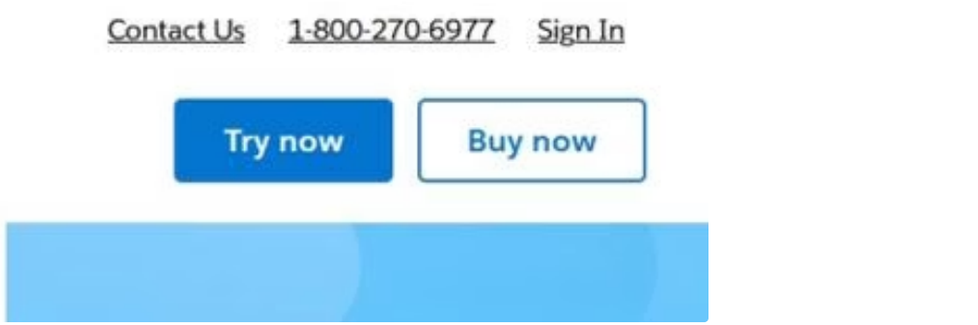
When choosing a data analysis tool, it is important to understand each tool's strengths and the most appropriate use case.

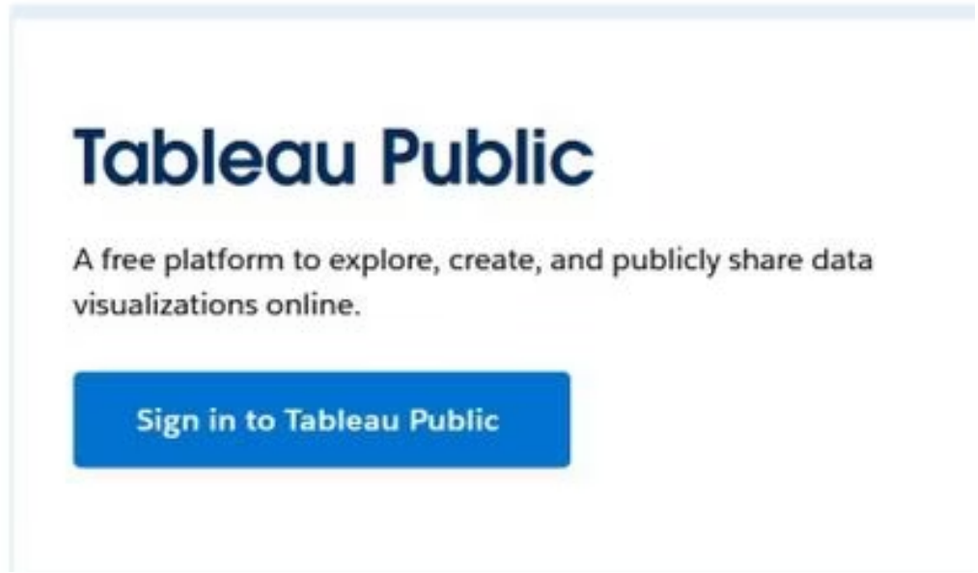
Criterion	Tableau	MS Excel	Power BI
Main Focus	Data visualization & dashboards	Data entry & calculations	Business analytics & reports
Ease of Use	Intuitive drag-and-drop	Widely known, can get complex	User-friendly environment
Visualization	Very broad and interactive	Basic charts	Interactive business reports
Strengths	Powerful dashboards & data storytelling	Flexible calculations & formulas	Integration with Microsoft tools
Weaknesses	Less suited for complex calculations	Limited visualization for large data	Less flexible design
Best For	Data analysts & visualization	Everyday office work	Enterprise KPIs & reporting

TABLEAU

Creating a Tableau Public Account — Steps 1–3

Start by visiting the Tableau official website. Registration is free and takes only a few minutes.





01

Open the Website

Go to **https://www.tableau.com/** in your browser.

02

Click Sign In

Find and click the **Sign In** button in the top right corner of the page.

03

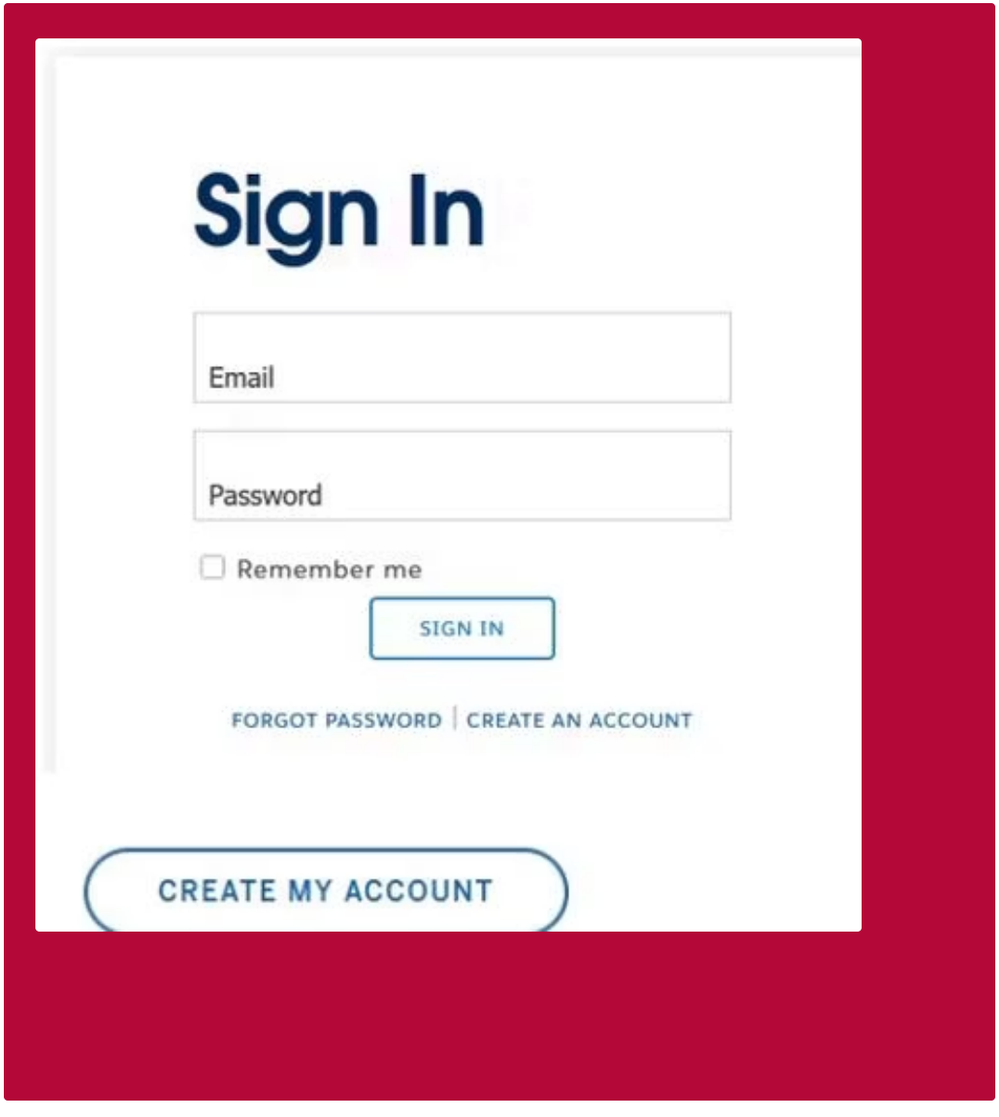
Choose Tableau Public

In the dropdown menu, select the option **Sign in to Tableau Public**.

TABLEAU

Creating a Tableau Public Account — Steps 4–6

If you don't have an account yet, create one by filling in the registration form. The process is simple and takes no more than 2–3 minutes.



01

Open tableau.com

02

Click Sign In

03

Select Sign in to Tableau Public

04

Click Sign Up / Create an account

05

Fill in the required fields

06

Click Create my account

TABLEAU

Creating a Tableau Public Account — Step 7: Web Authoring



After creating your account, you can immediately start working online using the **Web Authoring** environment — without installing any software.

Steps 1–6

Open tableau.com → Sign In → Sign in to Tableau Public → Sign Up → Fill in fields → Create my account.

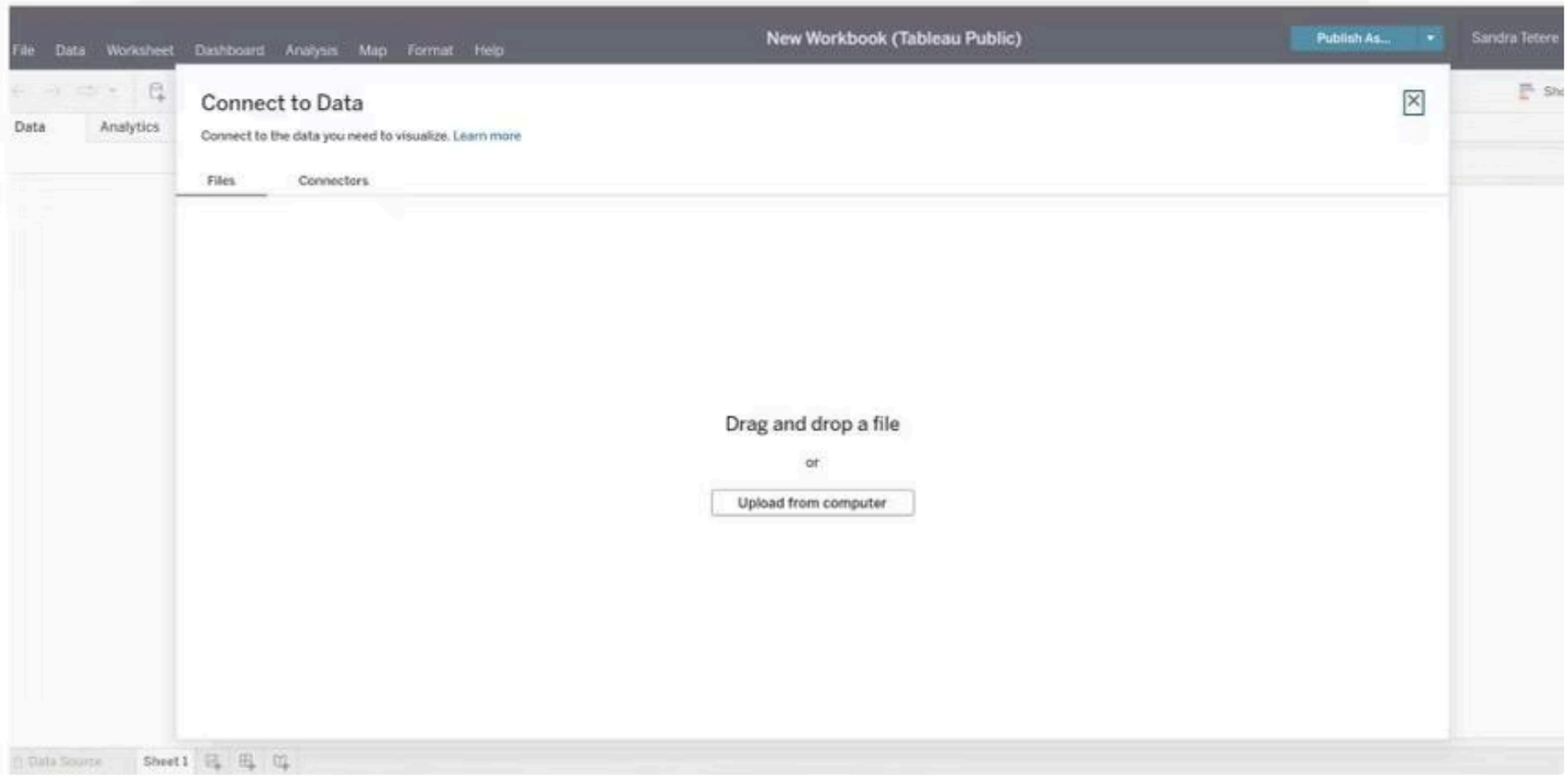
Step 7 — Web Authoring

After logging in, click **Create a Viz** or choose **Web Authoring** to start building visualizations directly in your browser.

Web Authoring lets you work with Tableau directly in your browser — no software installation required!

TABLEAU

Your Tableau Public Profile — Step 4



Congratulations! Your Tableau Public account has been successfully created. This is your personal Tableau Public profile where you can save and share your visualizations.

Profile Created

You now have a personal Tableau Public profile with a unique username.

Cloud Storage

All work is saved in the Tableau cloud and is publicly accessible.

Sharing

Completed visualizations can be shared via link or embedded in websites.

TABLEAU

What's Next in Tableau



Data Upload

Importing data from various sources — Excel, CSV, databases, and cloud services.



Worksheet Creation

Creating new worksheets and managing data fields for analysis.



Chart Types

Creating and customizing bar, line, pie, and geographic map visualizations.



Sharing & Exporting

Exporting and publishing finished visualizations as images, presentations, or interactive reports.



Academic License

Obtaining a free Tableau Desktop academic license for students and educators.

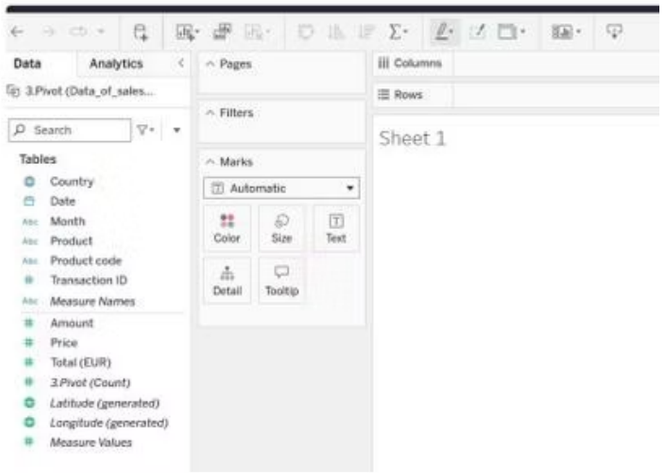
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TABLEAU

Creating Worksheets and Visualizations

The Tableau workspace is intuitive and based on the **drag-and-drop** principle. Data fields are placed in the respective areas to automatically generate a visualization.



1

New Worksheet

Click the «**New Worksheet**» icon in the bottom bar (or use Ctrl+M) to create a new analysis sheet.

2

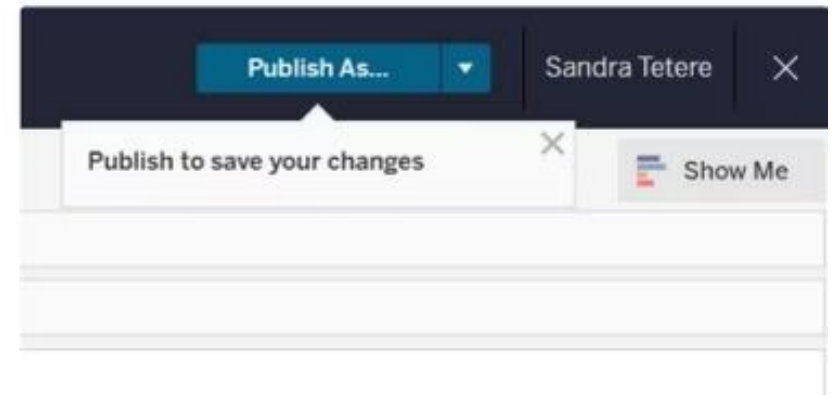
Create Visualization

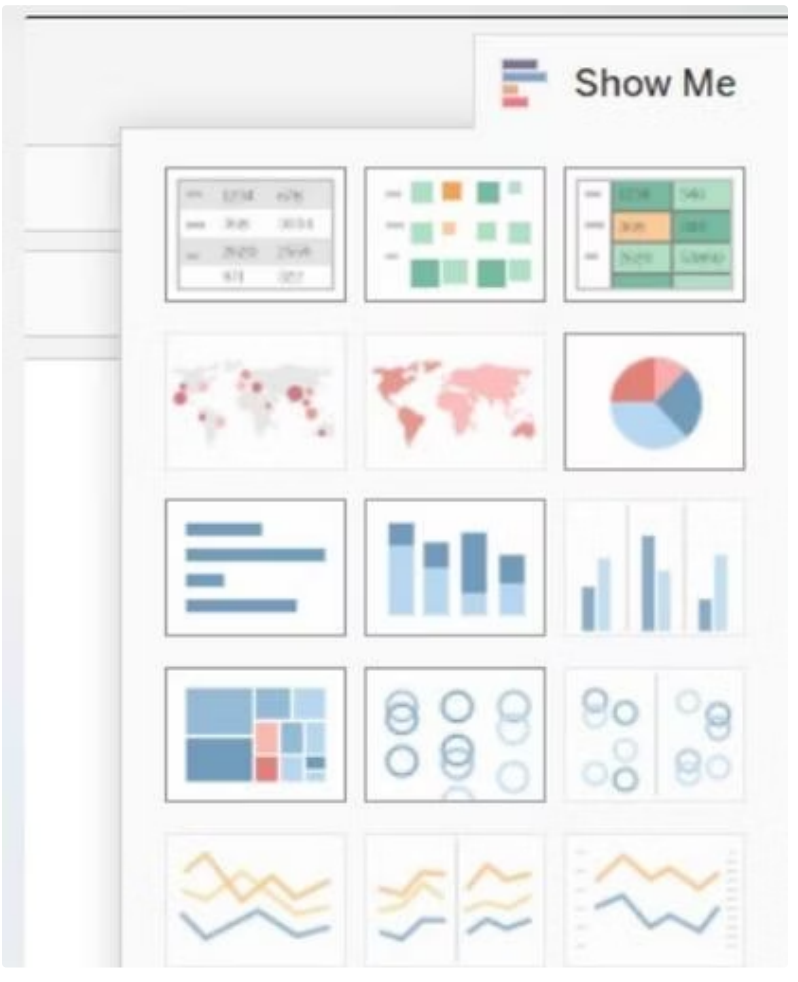
Drag the required fields from the left data panel onto «**Columns**» (horizontal axis) and «**Rows**» (vertical axis). Tableau automatically suggests the most suitable visualization type.

Tip: Use the «**Marks**» panel to customize colors, sizes, text, and details.

TABLEAU

Changing and Customizing Charts





Changing Chart Type

01

Click «Show Me»

Press the button in the top right corner.

02

Select Chart Type

Choose the desired chart type from the list.

03

Auto-Adjust

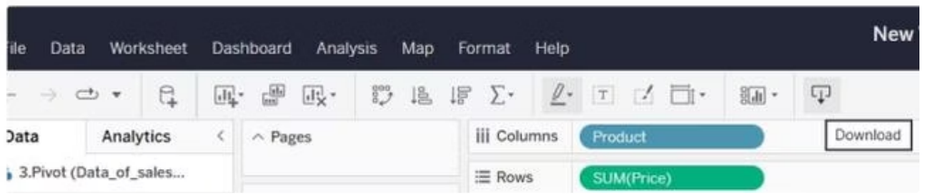
Tableau automatically adapts the data display.

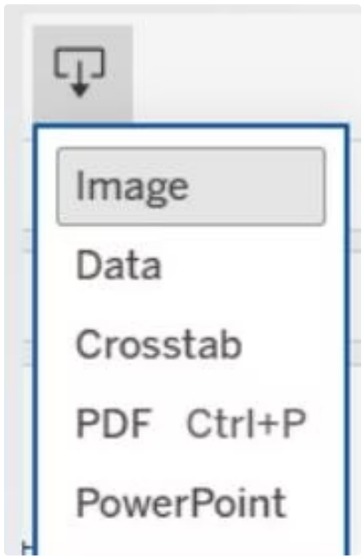
Additional Options

- **Swap rows/columns** — axis swap
- **Sort data** — ascending/descending order
- **Sum data** — data aggregation and summation
- **Download file** — as image, data, or presentation

TABLEAU

Downloading Visualizations





Download Steps

01

Click «Download»

In the menu, click on «Download».

02

Select File Type

Choose the required file format.

03

Confirm & Save

Confirm and save the file.

Available Formats

- **Image (PNG/JPEG)** — for presentations and reports
- **PDF** — high-quality printable format
- **PowerPoint** — direct integration into presentations
- **Data (CSV/Excel)** — processed data for further use
- **Crosstab** — table format with calculated values

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TABLEAU

Tableau Desktop — Academic License

Tableau offers a **free academic license** for all students and educators, providing access to the full professional tool in education at no cost.

Who Is It For?

Students and educators at accredited institutions. Two options: **Tableau for Students** and **Tableau for Teaching**.

License Terms

Issued for **1 year**, **renewable** as long as studies or teaching continue. Requires a verified academic email.

How to Register

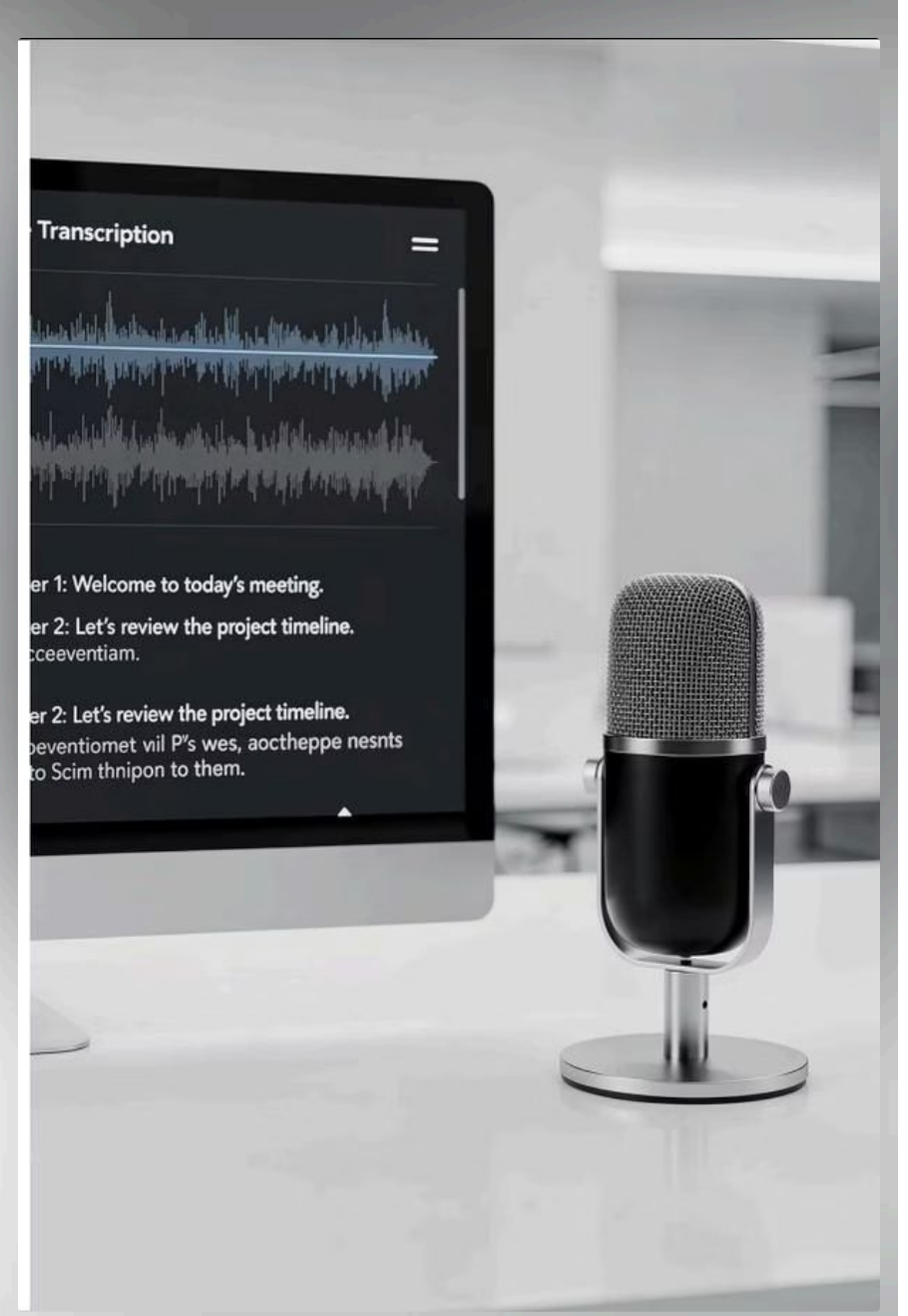
Visit the official page and fill in the application form:
tableau.com/community/academic

Use the academic license to master Tableau and strengthen your digital competencies in professional education!



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CHAPTER 3

Sonix — AI Transcription Tool

Sonix is an AI-based transcription tool that converts audio/video to text, helps analyze interviews, creates subtitles, and supports qualitative data processing in research. Access: **https://my.sonix.ai/**

Research Applications

- Interview transcription
- Focus group analysis
- Qualitative data structuring
- Quote selection & thematic analysis

Business Applications

- Meeting summaries
- Podcast transcription
- Video subtitles
- HR interview documentation
- Customer conversation analysis

Supported formats — Audio: MP3, WAV, M4A, AAC | Video: MP4, MOV, AVI, MPEG

SONIX

Sonix — Pros, Cons & Alternatives

Advantages

- Fast transcription & automatic subtitles
- Timestamp addition & text search
- Export (.docx, .txt, .srt)
- Very high accuracy in English

Disadvantages

- Manual correction required
- Limited Latvian language support
- Data security & GDPR concerns
- Accuracy decreases with multiple speakers

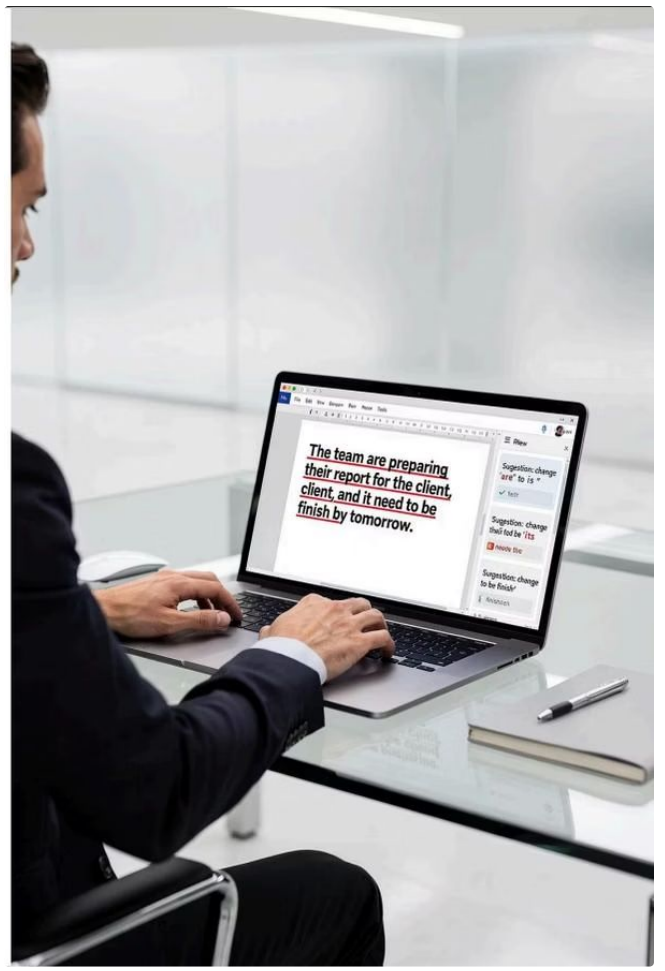
ⓘ Sonix is a paid tool (pay-as-you-go / subscription). Free trial: ~30 min audio/video transcription.

Alternatives Comparison

Tool	EN	HR	LV	Advantage
Otter.ai	✓	✗	✗	Meeting transcription
Fireflies.ai	✓	⚠️	✗	Zoom/Teams integration
Notta	✓	⚠️	⚠️	Simple interface
Descript	✓	⚠️	✗	Audio/video editing
Whisper AI	✓	✓	✓	High accuracy
Tactiq	✓	✗	✗	Google Meet transcription

CHAPTER 4

Grammarly — AI Writing Assistant



Grammarly is an AI-based writing assistant that helps check grammar, improve text, analyze style and tone, and build professional communication in English. It is primarily designed for English — most accurate in academic and business English. Latvian and Croatian do not have full grammar support.

Free version: Grammar & spell check, basic style suggestions. **Paid version:** Advanced AI, plagiarism check, tone & rewrite suggestions.

Study & Research

- Academic paper checking
- Article and publication editing
- Grammar, style, and citation correction

Business & Career

- Emails, project documentation, CVs
- Presentation texts & international communication

Alternatives

Tool	Advantage
LanguageTool	Multilingual support
QuillBot	Text paraphrasing
Hemingway Editor	Text simplification
Microsoft Editor	Office integration
ChatGPT	Text improvement & ideas
DeepL Write	Natural style & translation