

Matrix Shuffler

A Web App for Matrix Reordering

Esma Karic, Andrej Knaus, and Laura Thaçi

Information Visualisation 2025, Group 2

25 June 2025

Copyright 2025 by the author(s), except as otherwise noted.

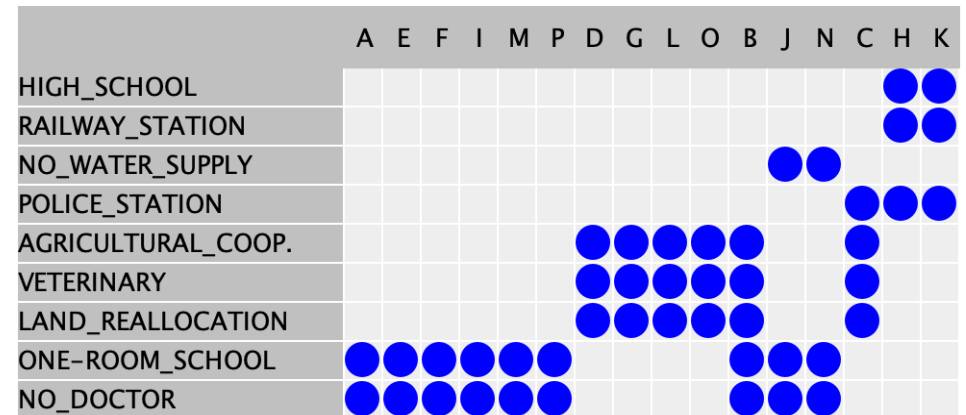
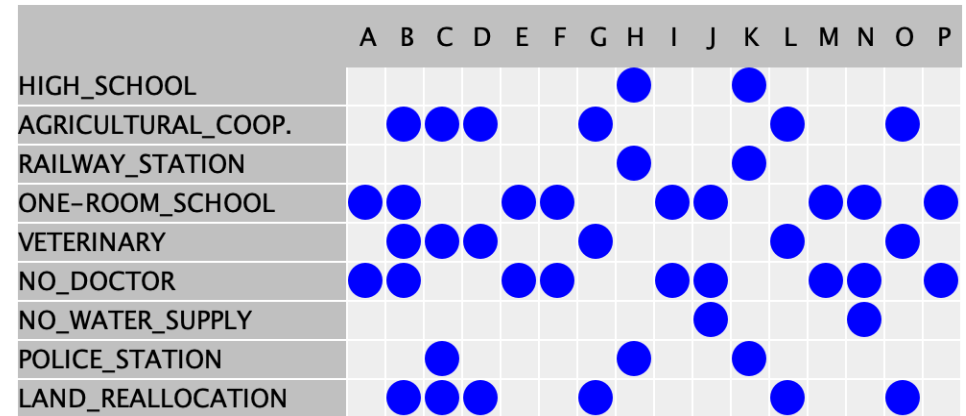
This work is placed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence

Overview

- Motivation
- Project Idea
- Tech Stack
- Features
- Manual Demo
- Algorithmic Demo
- Future Work

Motivation

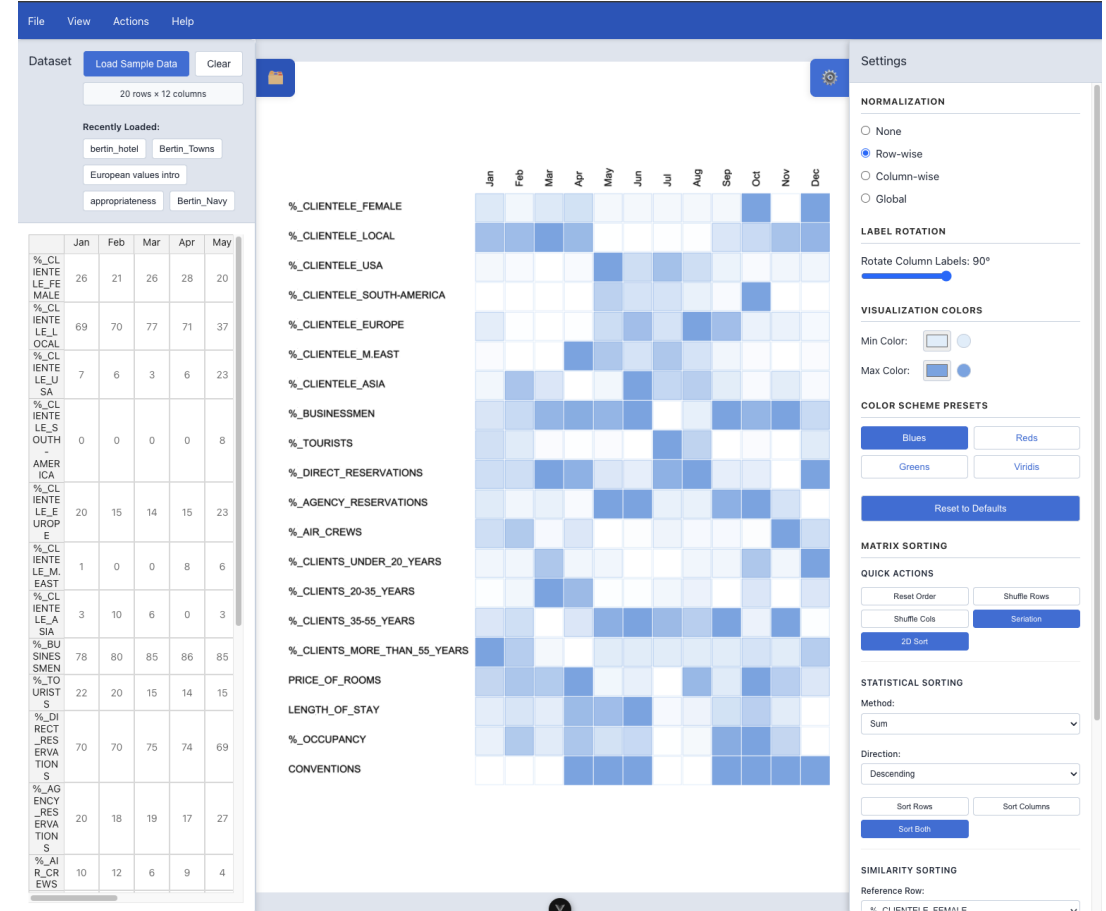
- Hard-to-read raw matrices.
- Need for interactive reordering.
- Visual clustering, anomaly spotting
- Support exploration



Bertin's township dataset in Matrix Explorer before and after 2D sort. Screenshot by Andrej Knaus.

Project Idea

- Web app for matrix reordering
- Cross platform support
- MIT license
- GitHub: <https://github.com/AndrejKnaus/matrix-shuffler>
- Live demo: <https://andrejknaus.github.io/matrix-shuffler/>



Overview with Bertin's hotel dataset. Screenshot by Andrej Knaus.

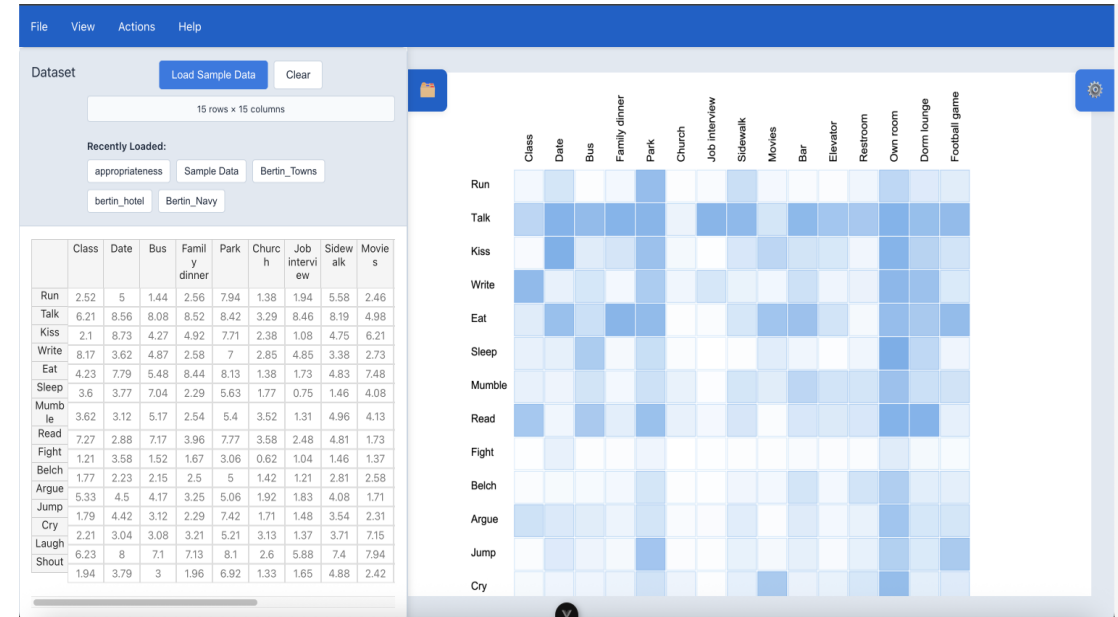
Tech Stack

- Frontend: Vue + TypeScript
- Styling: CSS
- Native Desktop: Tauri 2
- Build Tools: Vite
- Package Manager: PNPM
- Libraries: PixiJS



Features

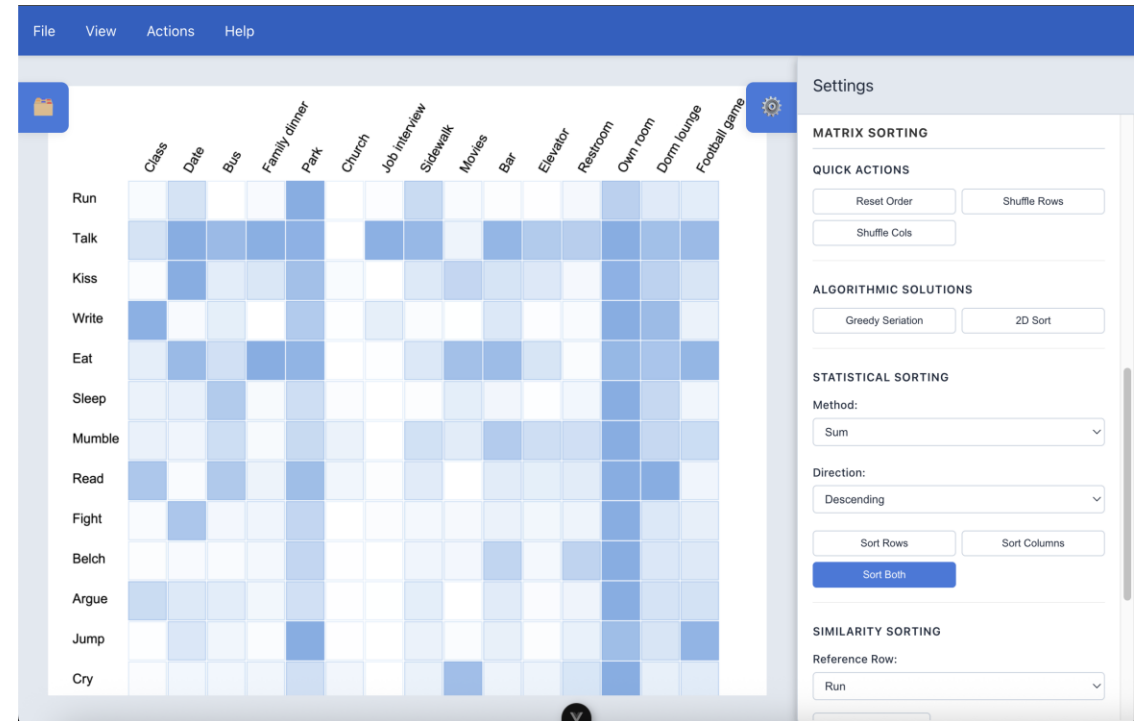
- Import CSV/TSV datasets
- Load recent datasets
- Table view
- Transpose dataset
- Various data encodings
- Normalize values



Matrix Shuffler with open Data panel. Screenshot by Andrej Knaus.

Features

- Manually reorder rows/columns
- Algorithmic solutions
- Shuffle rows/columns
- Sort by different methods
- Sort by similarity
- Export modified dataset
- Export as PNG/SVG

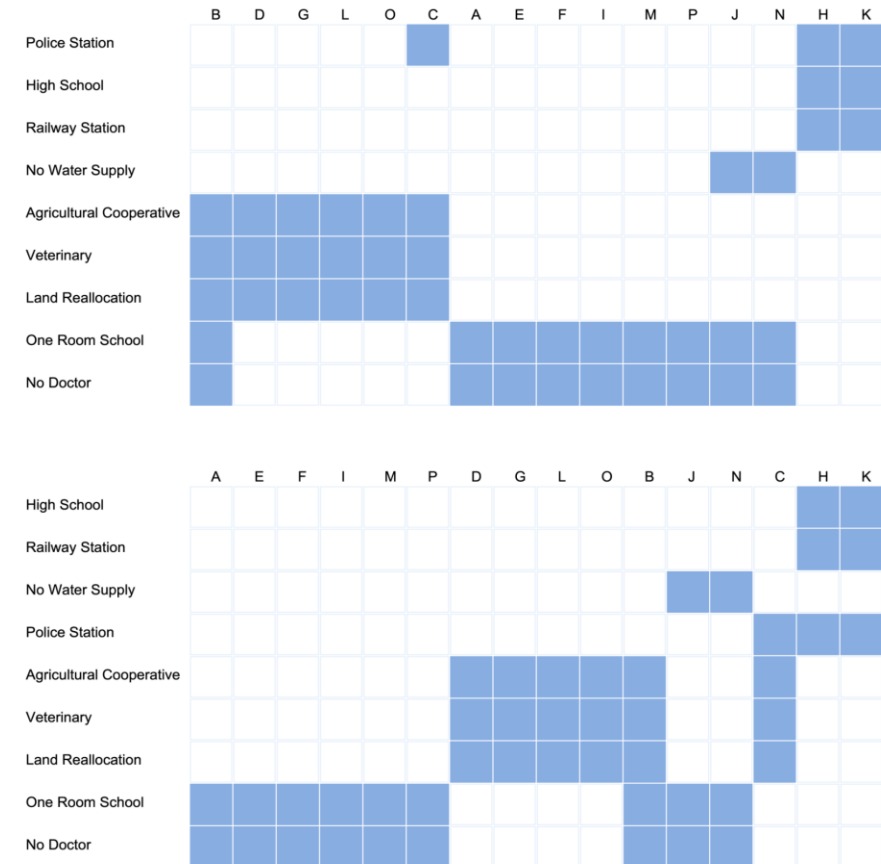


Matrix Shuffler with open Settings panel. Screenshot by Andrej Knaus.

Showcase Demo

Algorithmic Solutions

- 2D Sort ⁽¹⁾ : Sort rows/columns by average or sum.
- Greedy Seriation: Iteratively reorders rows/columns based on distance.



Bertin township dataset in Matrix Shuffler reordered with Greedy Seriation (top) and 2D Sort (bottom). Screenshot by Andrej Knaus.

Algorithmic Demo

Future Work

- Add more Encodings (original Bertin, texture/pattern encoding, etc.).
- Add more Algorithmic Solutions (BiMax, MDS, etc.).
- Optimize Performance for large Datasets.
- Enhance Navigation for large Datasets (Zoom, Minimap).

Q & A