

Create UI for ML models directly from Notebook

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MLinPL Conference, Warsaw 2023





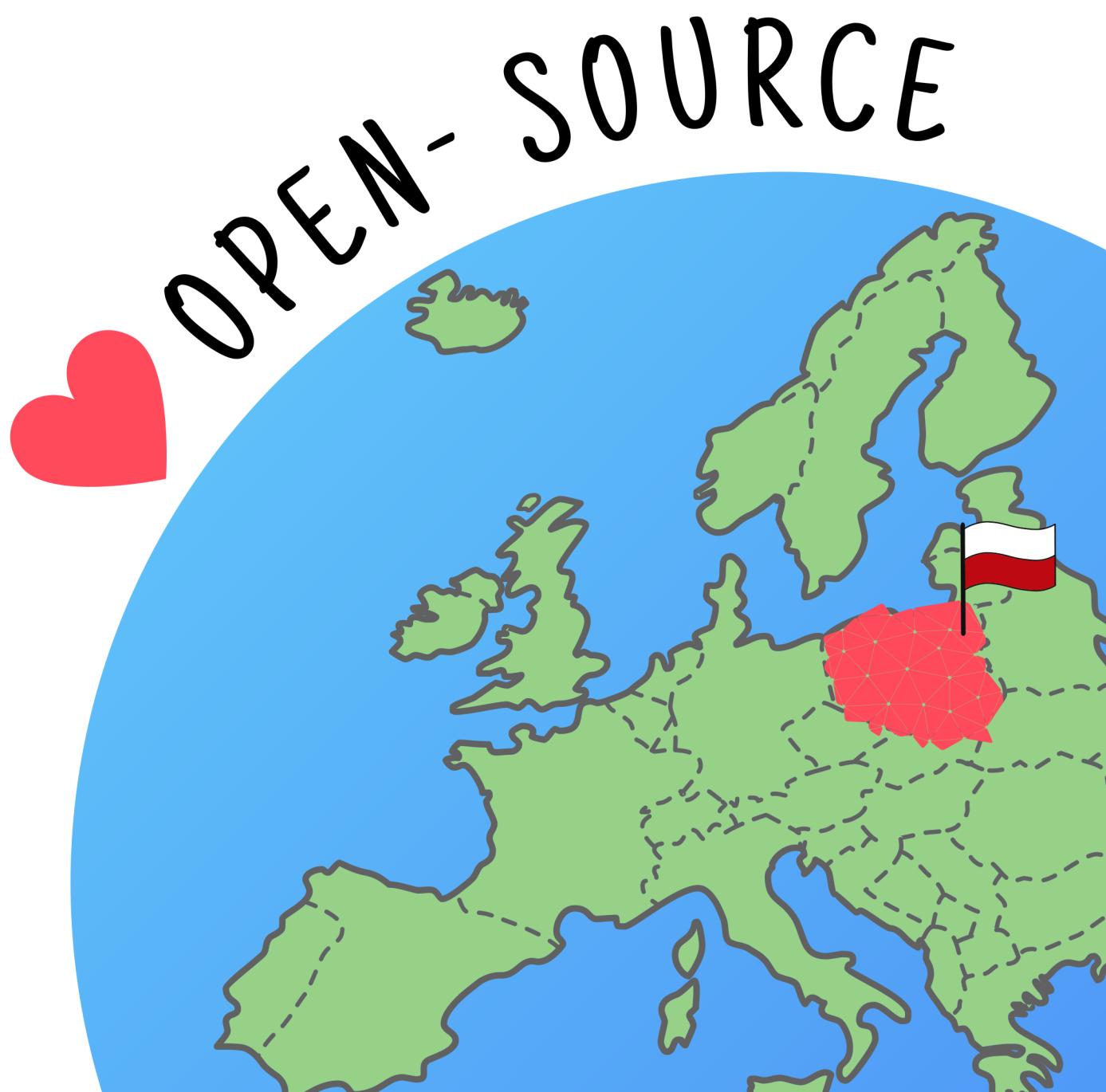
Data Science Tools

since 2016'



Based in Poland

Our mission is:
make data science accessible,
transparent, and efficient.



TOOLS



AutoML

MLJAR AutoML builds a complete Machine Learning Pipeline. It offers:

- advanced feature engineering
- algorithms selection and tuning
- automatic documentation
- ML explanations



Mercury is a web framework for converting Python Notebooks into interactive web applications



AutoML



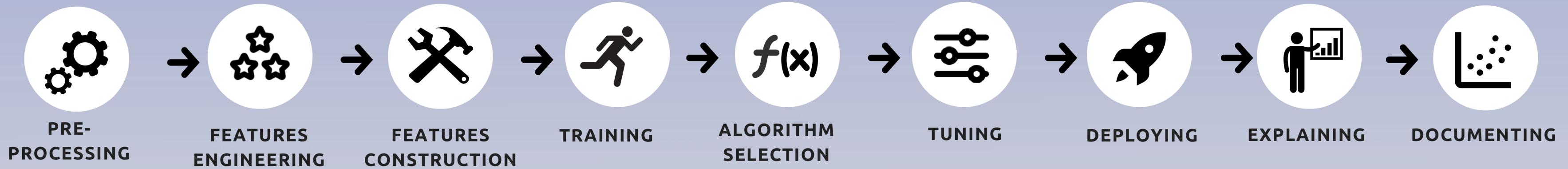
- ★ open-source
- ★ **86 citations** in research papers
- ★ around **1 million** downloads
- ★ works with **Python** with versions 3.8, 3.9, 3.10, 3.11
- ★ **MIT** license

HOW IT WORKS

mljar-supervised
one Python package that includes



MACHINE LEARNING PIPELINE - STAGES AUTOMATED WITH AUTOML



AUTO-SAVE & AUTO-DOC

INPUT DATA FILE

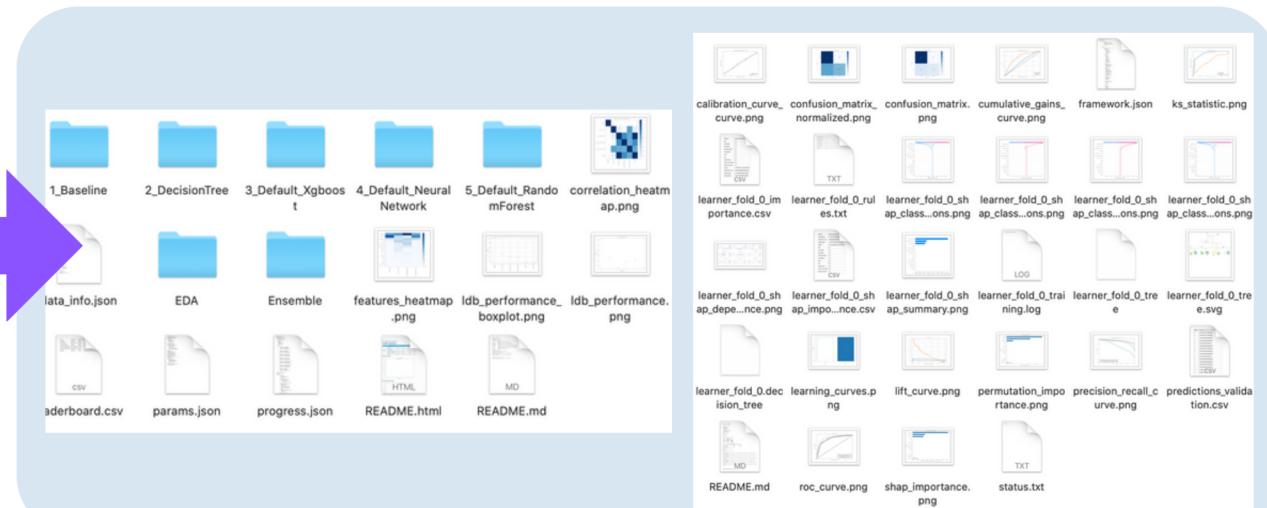
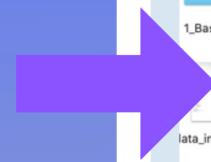
| Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin | Survived |
|--------|---|--------|-----|-------|-------|------------------|---------|--------|----------|
| 3 | Braund, Mr. Owen Harris | male | 22 | 1 | 0 | A/5 21171 | 7.25 | | 0 |
| 1 | Cumings, Mrs. John Bradley (Florence Briggs Thayer) | female | 38 | 1 | 0 | PC 17599 | 71.2833 | C85 | 1 |
| 3 | Heikkinen, Miss. Laina | female | 26 | 0 | 0 | STON/O2. 3101282 | 7.925 | | 1 |
| 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35 | 1 | 0 | 113803 | 53.1 | C123 | 1 |
| 3 | Allen, Mr. William Henry | male | 35 | 0 | 0 | 373450 | 8.05 | | 0 |
| 3 | Moran, Mr. James | male | | 0 | 0 | 330877 | 8.4583 | | 0 |
| 1 | McCarthy, Mr. Timothy J | male | 54 | 0 | 0 | 17463 | 51.8625 | E46 | 0 |
| 3 | Palsson, Master. Gosta Leonard | male | 2 | 3 | 1 | 349909 | | 21.075 | |
| 3 | Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg) | female | 27 | 0 | 2 | 347742 | | | |
| 2 | Nasser, Mrs. Nicholas (Adele Achem) | female | 14 | 1 | 0 | 237736 | | | |
| 3 | Sandstrom, Miss. Marguerite Rut | female | 4 | 1 | 1 | PP 9549 | | | |
| 1 | Bonnell, Miss. Elizabeth | female | 58 | 0 | 0 | 113783 | | | |
| 3 | Saunderscock, Mr. William Henry | male | 20 | 0 | 0 | A/5. 2151 | | 8.05 | 0 |
| 3 | Andersson, Mr. Anders Johan | male | 39 | 1 | 5 | 347082 | | 31.275 | 0 |
| 3 | Vestrom, Miss. Hulda Amanda Adolfinna | female | 14 | 0 | 0 | 350406 | | 7.8542 | 0 |
| 2 | Hewlett, Mrs. (Mary D Kingcome) | female | 55 | 0 | 0 | 248706 | | 16 | 1 |
| 3 | Rice, Master. Eugene | male | 2 | 4 | 1 | 382652 | | 29.125 | 0 |
| 2 | Williams, Mr. Charles Eugene | male | | 0 | 0 | 244373 | | 13 | 1 |
| 3 | Vander Planke, Mrs. Julius (Emelia Maria Vandemoortele) | female | 31 | 1 | 0 | 345763 | | 18 | 0 |
| 3 | Masselmani, Mrs. Fatima | female | | 0 | 0 | 2649 | | 7.225 | 1 |
| 2 | Evrard, Mr. Joseph J | male | 35 | 0 | 0 | 239865 | | 26 | 0 |



AutoML

with a few lines of code

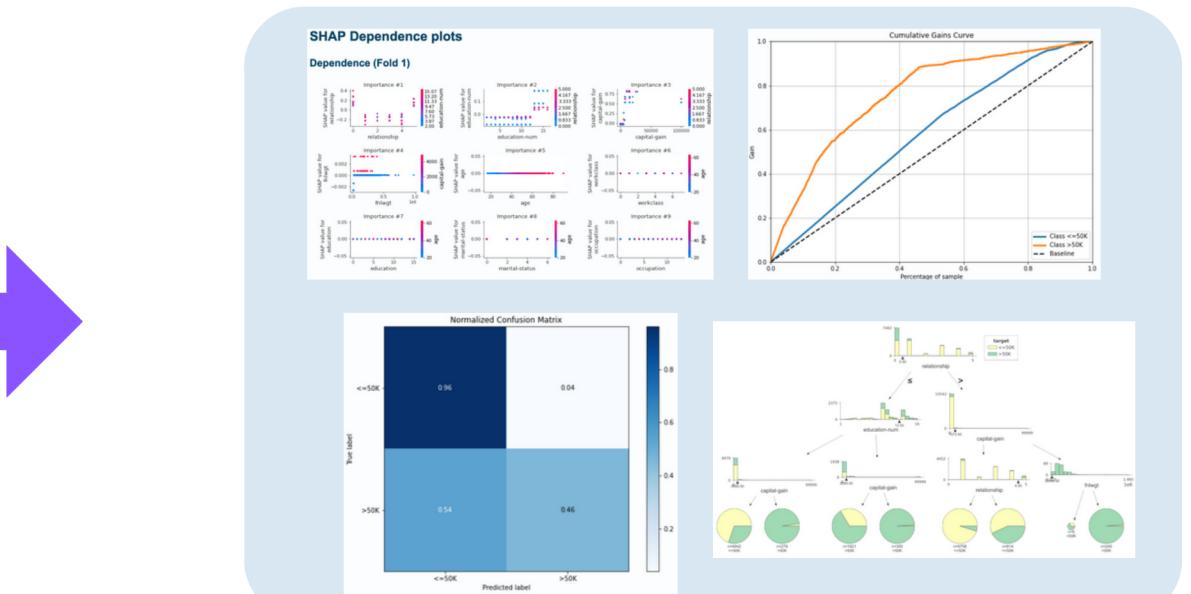
```
● ● ●  
>_  
from supervised import AutoML  
automl=AutoML()  
automl.fit(X,y)  
pred = automl.predict(X_test)
```



MODEL LEADERBOARD

| Best model | name | model_type | metric_type | metric_value | train_time |
|-------------------|--------------------------------|-------------------|--------------------|---------------------|-------------------|
| | 1_Baseline | Baseline | logloss | 0.555532 | 0.74 |
| | 2_DecisionTree | Decision Tree | logloss | 0.376732 | 10.99 |
| the best | 3_Default_Xgboost | Xgboost | logloss | 0.285863 | 7.57 |
| | 4_Default_NeuralNetwork | Neural Network | logloss | 0.341575 | 6.63 |
| | 5_Default_RandomForest | Random Forest | logloss | 0.353436 | 6.95 |
| | Ensemble | Ensemble | logloss | 0.285863 | 1.2 |

MANY VISUALIZATIONS



EXPLAIN YOUR WORK

SHOW ML PIPELINE FOR BOSS



I WANT ANSWERS



**CALL THE DATA SCIENTIST.
RIGHT NOW!**

PROBLEM

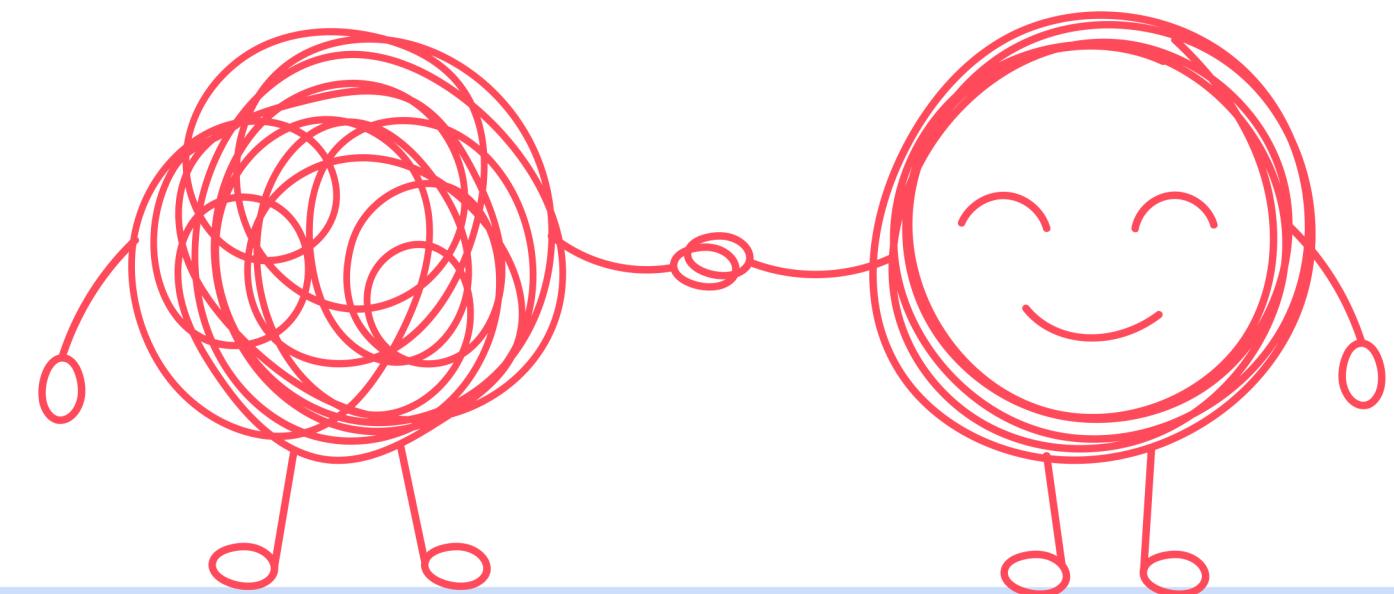
You wrote perfect code,
done a sophisticated analysis
with complicated algorithms...

and want to share it with
non-technical users

PROBLEM TO SOLVE

Can't share notebooks with non-technical users

- PYTHON KNOWLEDGE
- INSTALLING & UPDATING PACKAGES
- SOMETIMES SPECIAL HARDWARE
- DATA ACCESS



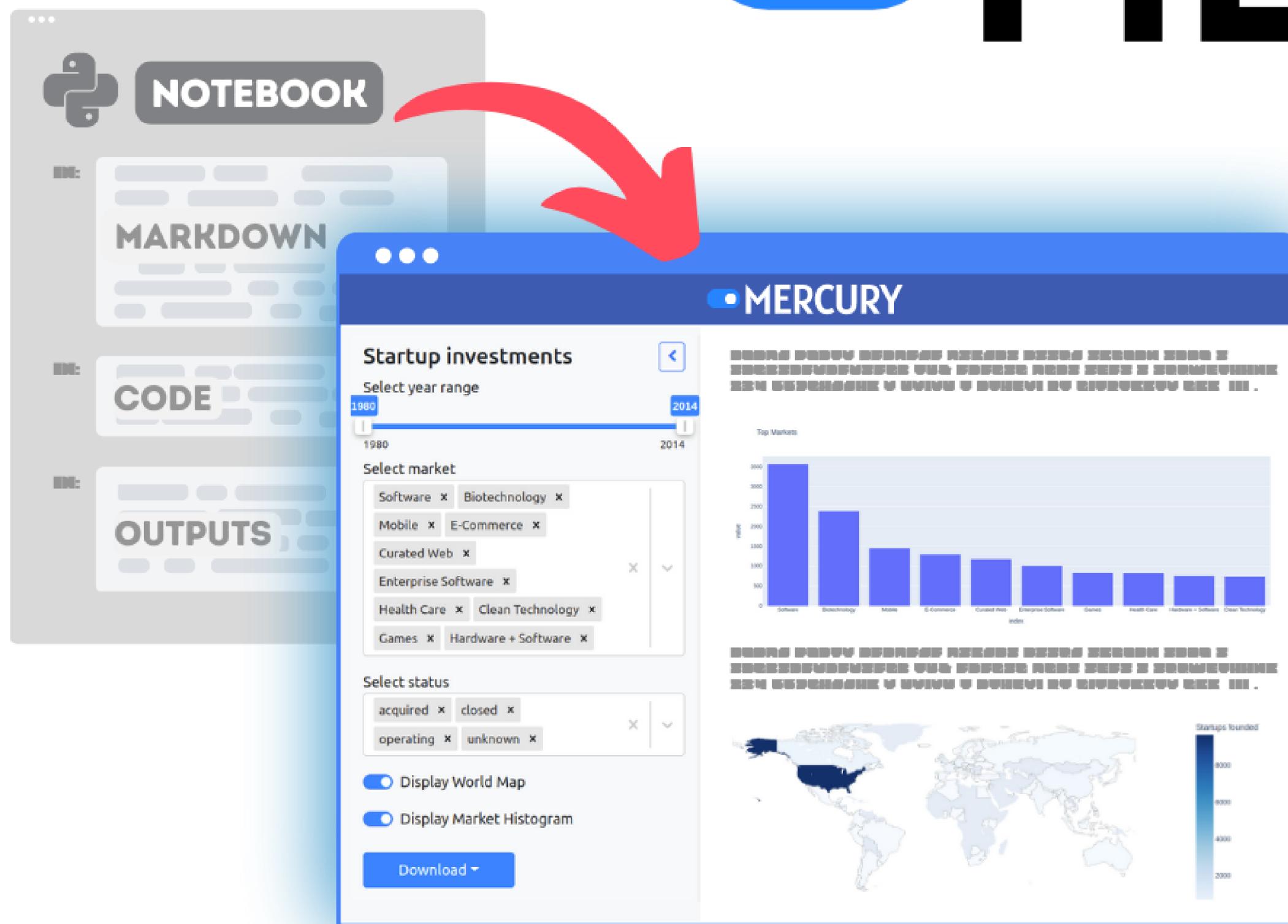


PROBLEM TO SOLVE

You can share your results:

- E-MAIL
- POWERPOINT
- REWRITE TO WEB APP

MERCURY



Framework for sharing notebook

WHY IT IS DIFFERENT?

- NO CALLBACKS!
- NO LAYOUT WIDGETS

- SIMPLE
- APP FEATURES
- EASY DEPLOYMENT

The image displays a grid of eight cards, each representing a different data analysis or visualization project built with the Mercury framework. The cards are arranged in two columns and four rows.

- Reddit>Data Science Salary Analysis 2021**: A card showing raw statistics and salary data for Data Scientists based on reddit discussion in 2021. It includes a table of raw statistics and a scatter plot.
- Reddit>Data Science Salary, 2021 (with code)**: A card showing salary analysis for Data Scientists based on reddit discussion in 2021, including the Python code used to generate the analysis.
- Movies Explorer**: A card showing a scatter plot of movies data with Mercury, including the Python code used to generate the plot.
- Movies Explorer with code**: A card showing movies data with Mercury, including the Python code used to generate the analysis.
- Countries Life Expectancy and GDP**: A card showing a bar chart of population data for countries, including the Python code used to generate the chart.
- Countries Life Expectancy and GDP with code**: A card showing countries data, including the Python code used to generate the analysis.

Each card features a "Open" button at the bottom right, which likely links to a live demo or the source code repository on GitHub.

```
[1]: import mercury as mr
```

```
[2]: greetings = mr.Select(label="Greetings", value="Hello",
                           choices=["Hello", "Cześć"])
```

Greetings ▾

```
[3]: city = mr.Text(label="City", value="Warsaw")
```

City

```
[4]: year = mr.Slider(label="Year", min=2020, max=2025, value=2023)
```

Year 2023

```
[5]: mr.Markdown(f"# 🙌 {greetings.value} {city.value} {year.value}!")
```

👋 Hello Warsaw 2023!

starter



Greetings

Hello



City

Warsaw

Year

2023



2020

2025



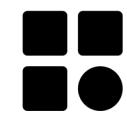
Download ▾

Share



Hello Warsaw 2023!

FEATURES



multiple apps

Share as many notebooks as you want.



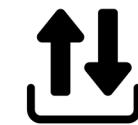
authentication

Decide with whom to share your notebooks.



export to PDF or HTML

Users can easily export the executed notebook as a PDF or HTML



output files

Produce files in notebook and make the downloadable for users



embedding

Run notebook with Mercury and embed it on any website



hide or show code

Decide whether you want to show or hide code in the app

YOU CAN BUILD

REPORT

WEB APP

PDF

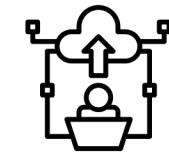
This block displays two main components: a 'REPORT' section on the left featuring a 'SELECT' button and a 'PDF' icon, and a 'WEB APP' section on the right containing several different types of charts and graphs.

PRESENTATION

This block shows a 'PRESENTATION' section with a variety of data visualizations, including a pie chart, a line graph, and several bar charts.



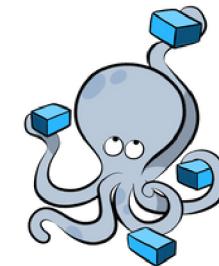
DEPLOYING



self-hosted

with

Docker-Compose



Ngrok

ngrok



self-hosted

Commercial

Deployment dashboard to manage notebooks and users, and:

- User analytics
- Private forks
- Style customization
- Email support



mercury cloud

Create your site

- choose from many domains & set your custom domain:

YOUR NAME.isDataScientist.com

.PreviewReport.com

.RunMercury.com

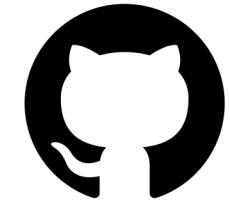
.DataInAdvance.com

- or use your custom domain

THANK YOU!



runmercury.com



github.com/mljar