Create UI for ML models directly from Notebook

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mljar

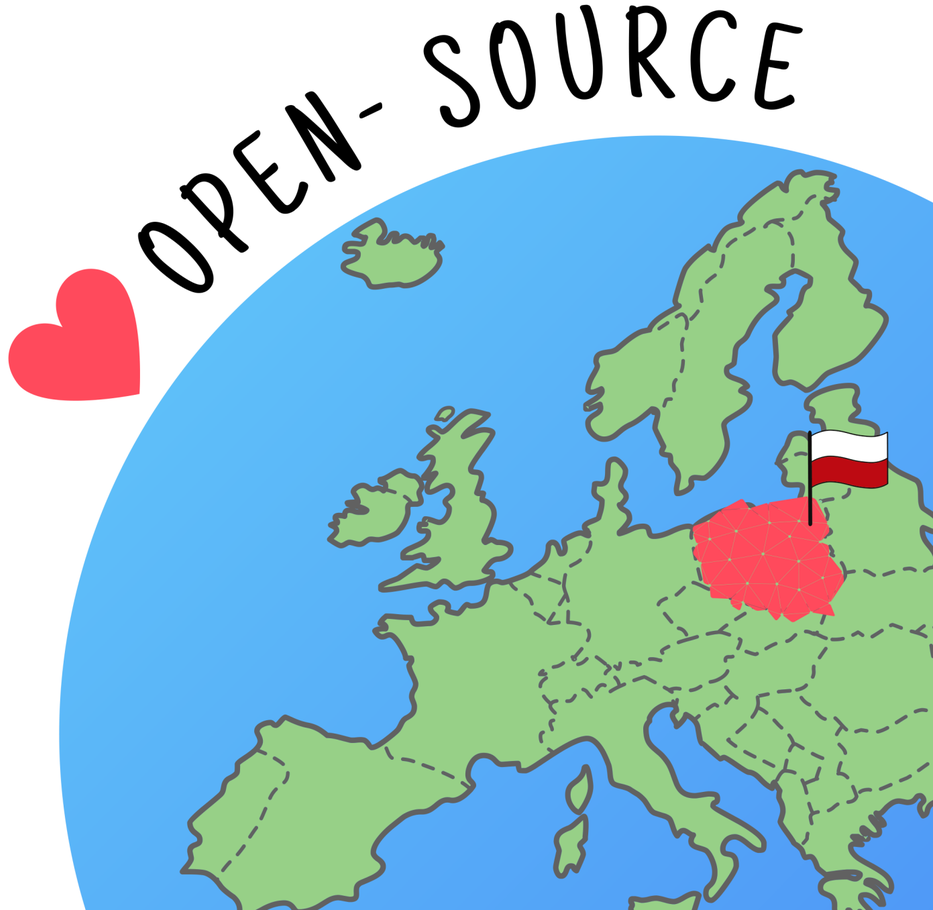
MLinPL Conference, Warsaw 2023

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

CatBoost NumPy scikit learn pandas LightGBM

M↓ OPTUNA matplotlib XGBoost

MACHINE LEARNING **PIPELINE** - STAGES AUTOMATED WITH **AUTOML**

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		0
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	Saundercock, 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 Adolfina	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	Fynney, Mr. Joseph J	male	35	0	0	239865	26		0

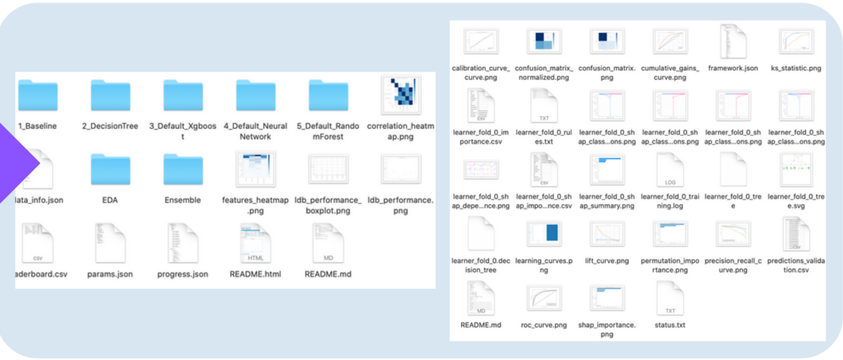
X y

AutoML

with a
few lines of code

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

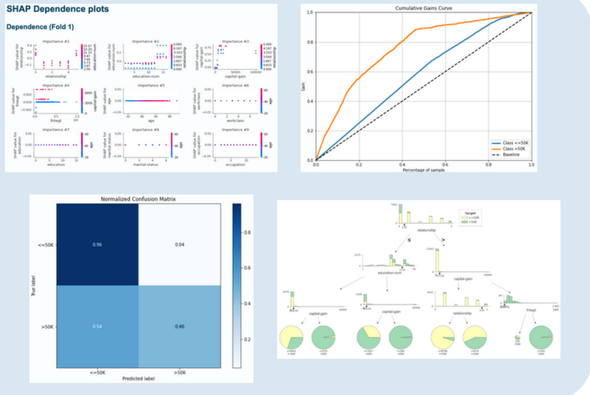
AUTO-SAVE & AUTO-DOC



MODEL LEADERBOARD

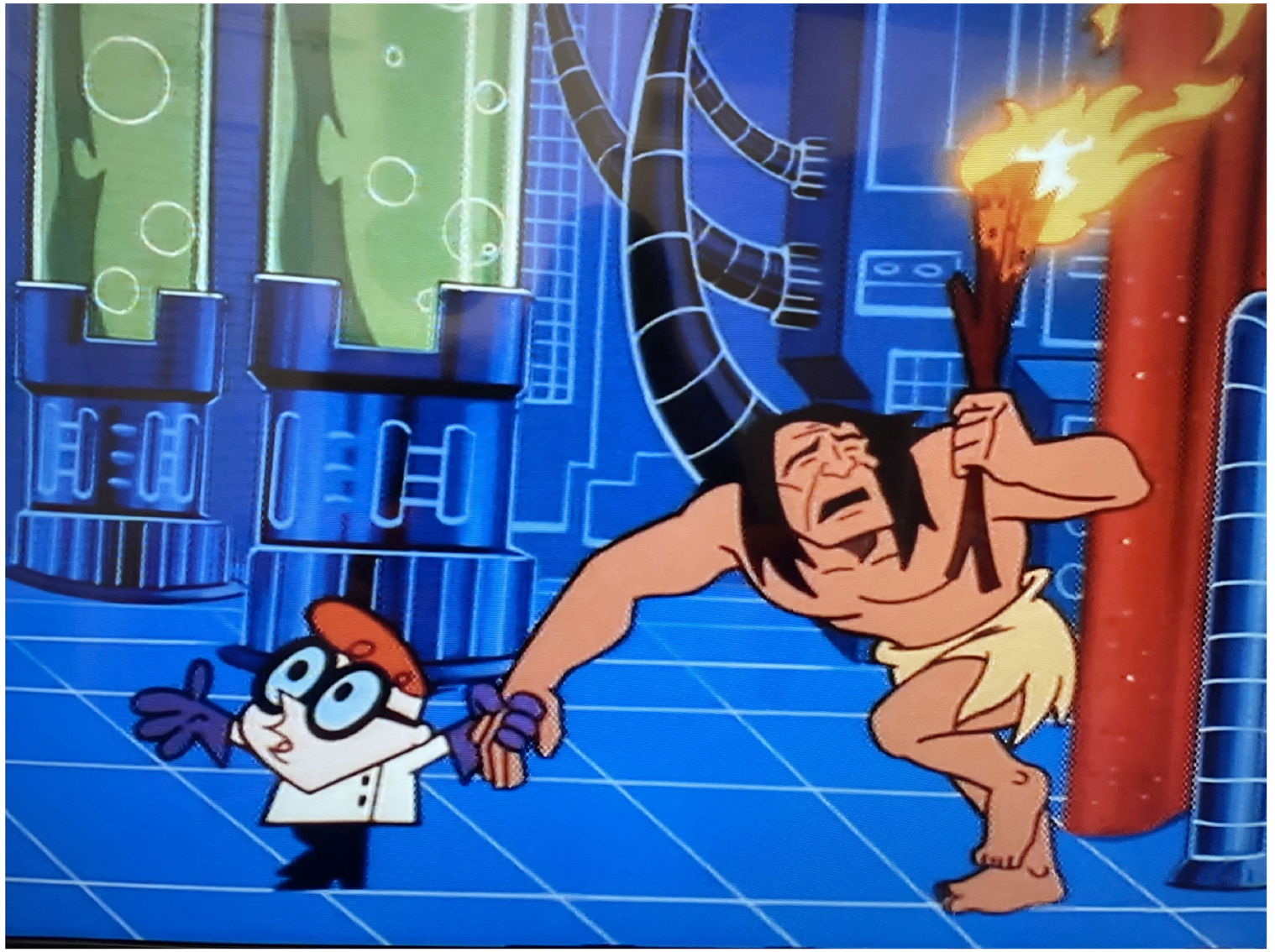
Best model	name	model_type	metric_type	metric_value	train_time
	1_Baseline	Baseline	logloss	0.555532	0.74
	2_DecisionTree	Decision Tree	logloss	0.376732	10.99
the best	3_Default_Xgboost	Xgboost	logloss	0.285863	7.57
	4_Default_NeuralNetwork	Neural Network	logloss	0.341575	6.63
	5_Default_RandomForest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

MANY VISUALIZATIONS



EXPLAIN YOUR WORK

SHOW ML PIPELINE FOR BOSS



PROBLEM

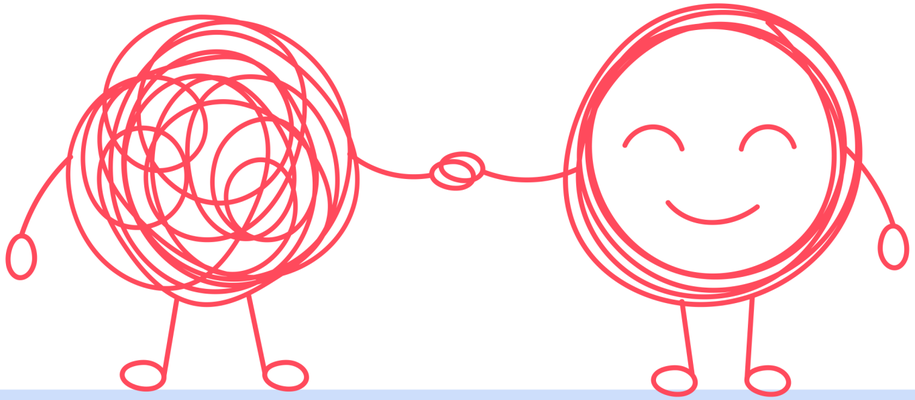
You wrote perfect code, done a sophisticated analysis with complicated algorithms...

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

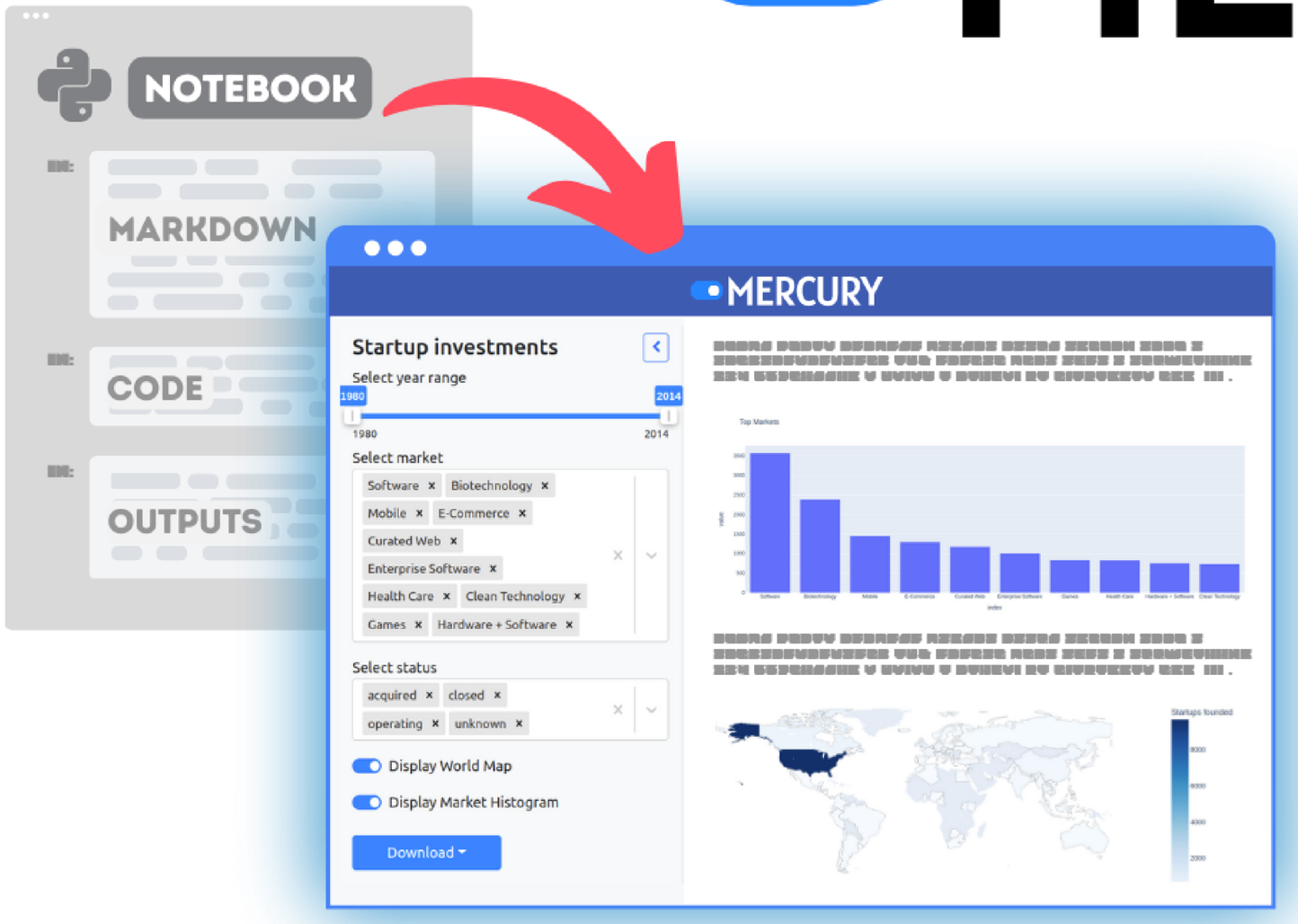


PROBLEM TO SOLVE

You can share your results:

- E-MAIL
- POWERPOINT
- REWRITE TO WEB APP

MERCURY

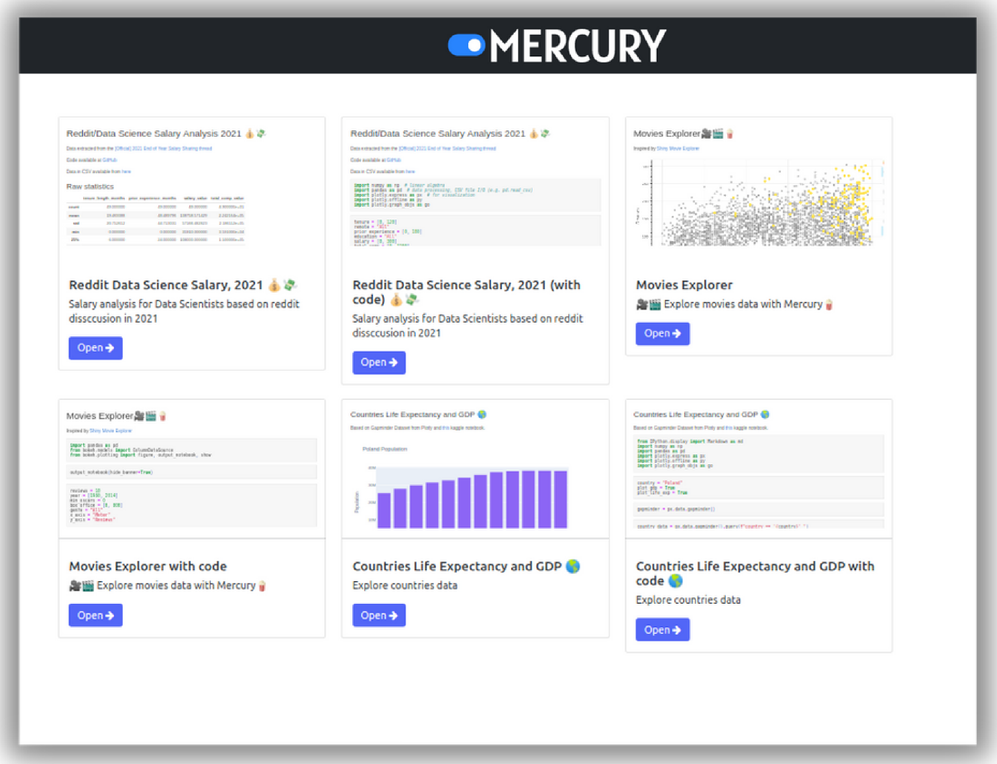


Framework for
sharing notebook

WHY IT IS DIFFERENT?

- NO CALLBACKS!
- NO LAYOUT WIDGETS

- SIMPLE
- APP FEATURES
- EASY DEPLOYEMNT



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

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

Greetings Hello

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

City Warsaw

[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!

MERCURY

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

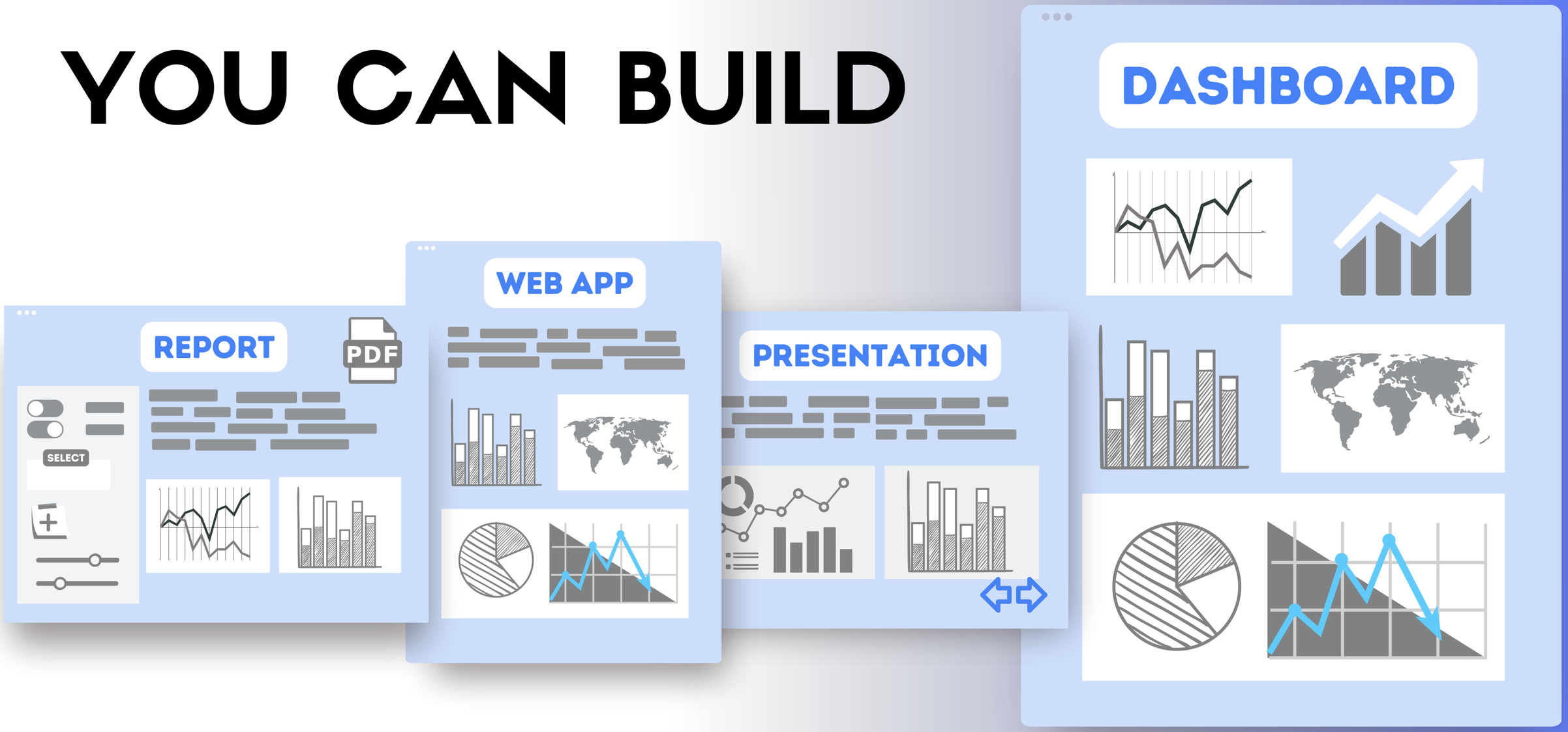
embedding

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

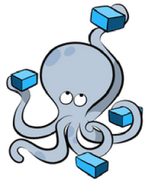


DEPLOYING

self-hosted

with

Docker-Compose



Ngrok

ngrok

Hugging Face

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