Introduction to scikit-learn

EuroSciPy 2025
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Tutorial agenda

What are we going to talk about?

1. Introduction
2. Why Python?
3. What is Scikit-learn?
4. What is machine learning?
5. Tutorial

Who am I?

- Research Assistant at University of Szczecin, Institute of Management
- Research focus : machine learning in business application and methods of teaching programming

Why Python?

Easy to learn

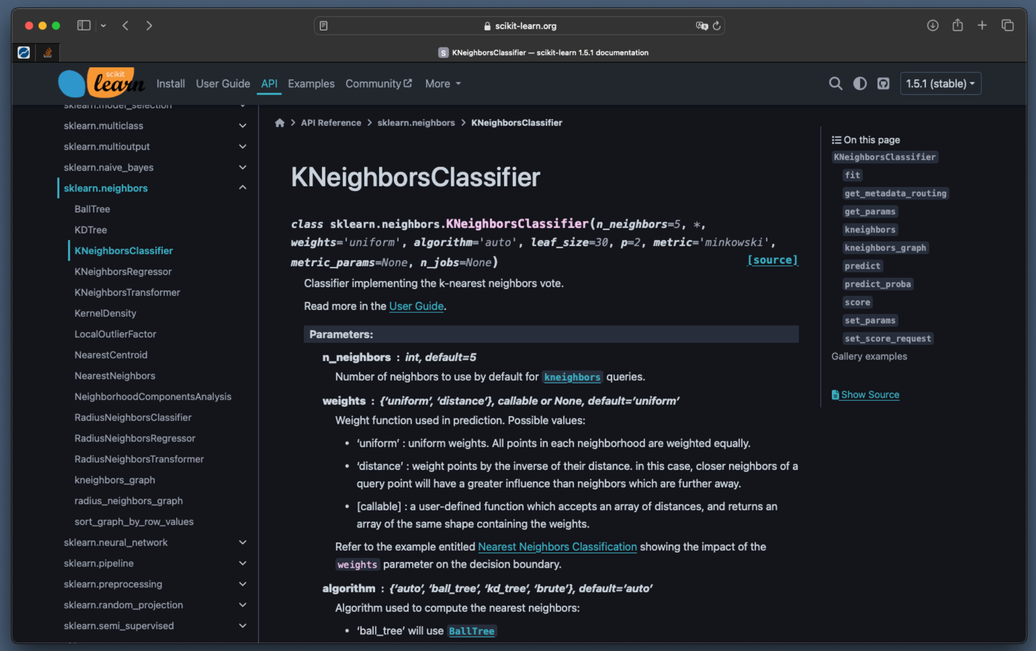
Powerful

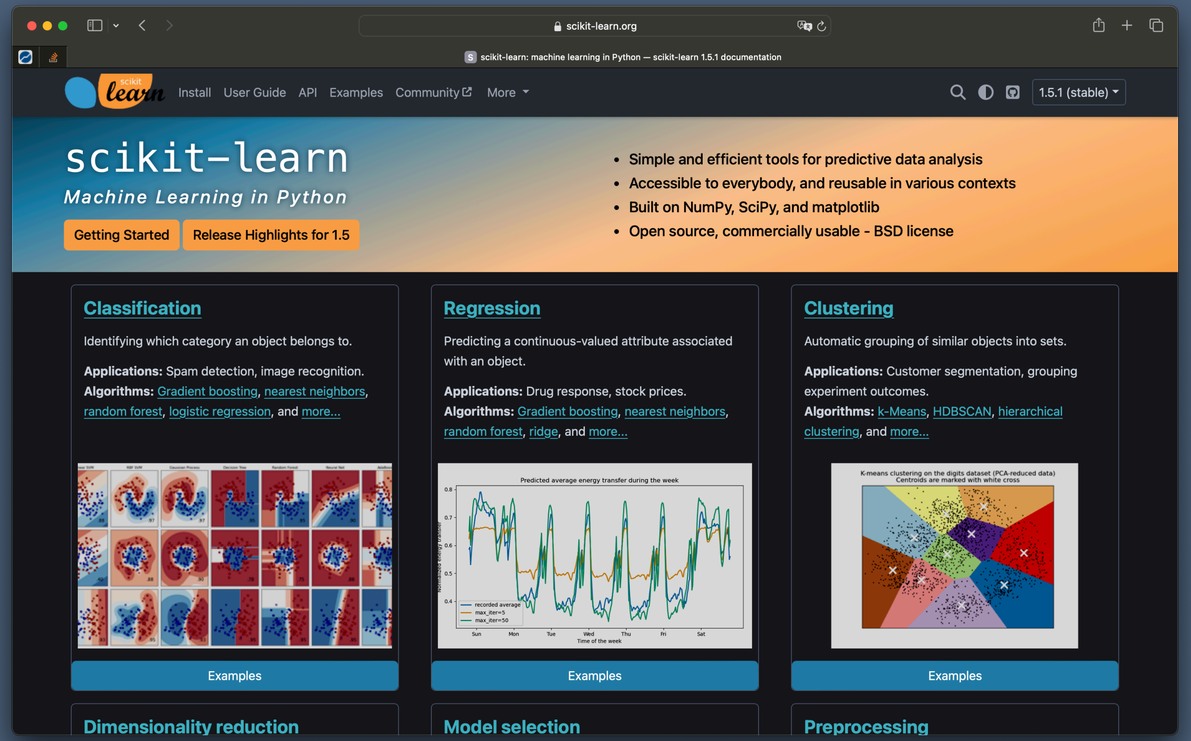
Free

python SOFTWARE FOUNDATION

Scikit-learn

Free and open-source machine learning library for Python. It’s build on NumPy, SciPy and matplotlib.



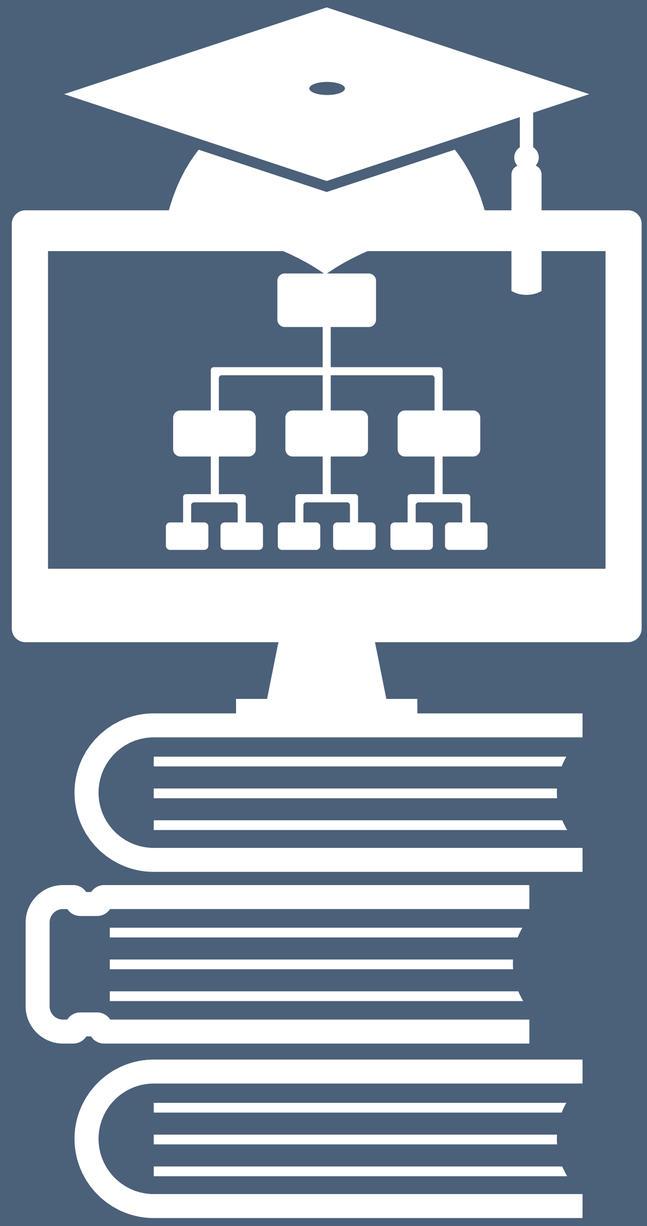


Machine learning

What is it and why is it so popular?

„Machine learning (ML) is a branch of artificial intelligence (AI) and computer science that focuses on the using data and algorithms to enable AI to imitate the way that humans learn, gradually improving its accuracy.” (IMB, 2024)

What usually follows is prediction. It is widely use in business, examples: Google, Netflix, Government institutions, banks, etc.



Types of machine learning

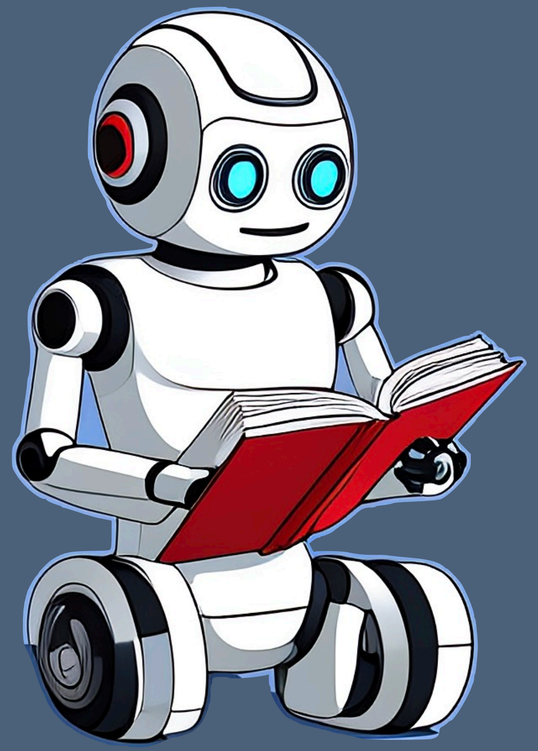
- Supervised
- Unsupervised
- Self-supervised
- Reinforcement
- Semi-supervised

Supervised machine learning

It’s a type of machine learning where model is trained on labeled dataset

Supervised machine learning algorithms:

- Regression algorithms
- Classification algorithms
- Neural networks
- Random forest algorithms

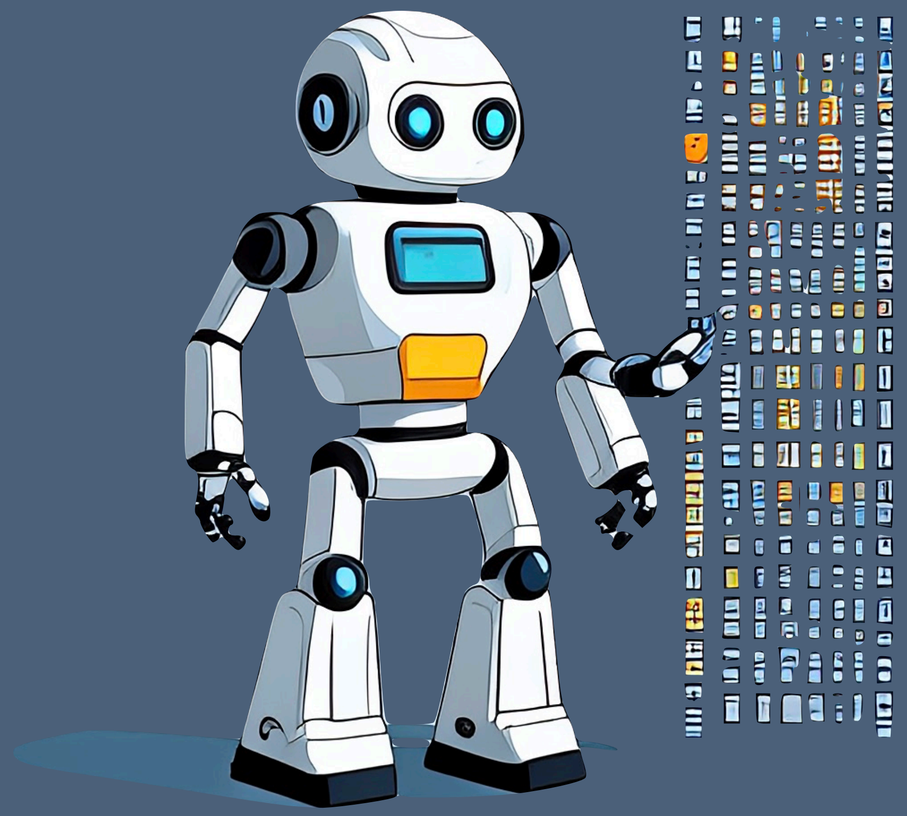


Unsupervised machine learning

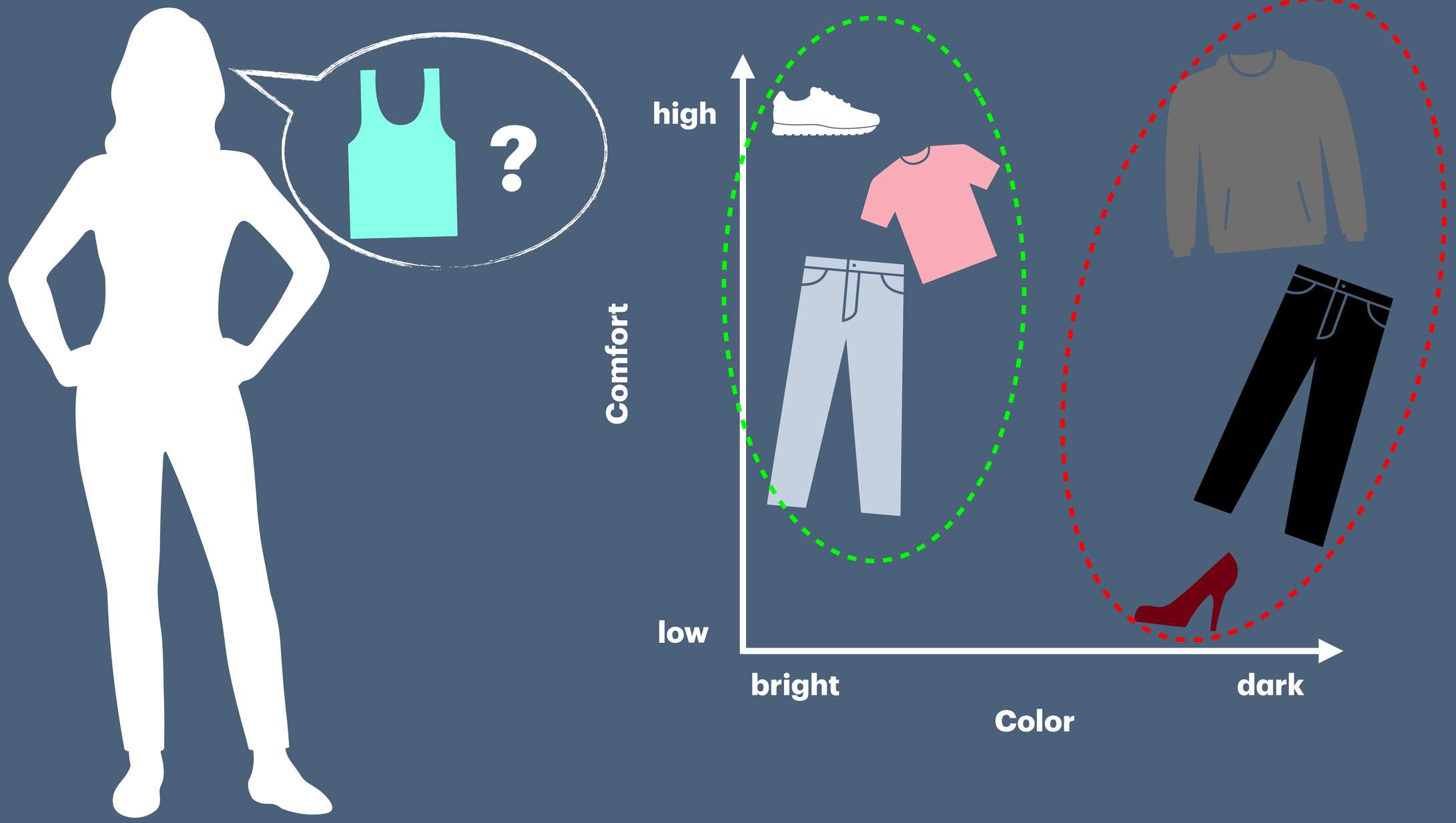
It’s a type of machine learning where model is trained on unlabeled dataset - trying to find patterns without explicit help.

Unsupervised machine learning algorithms:

- K-means clustering
- Spectral clustering
- Hierarchical clustering



Which clothes will she buy?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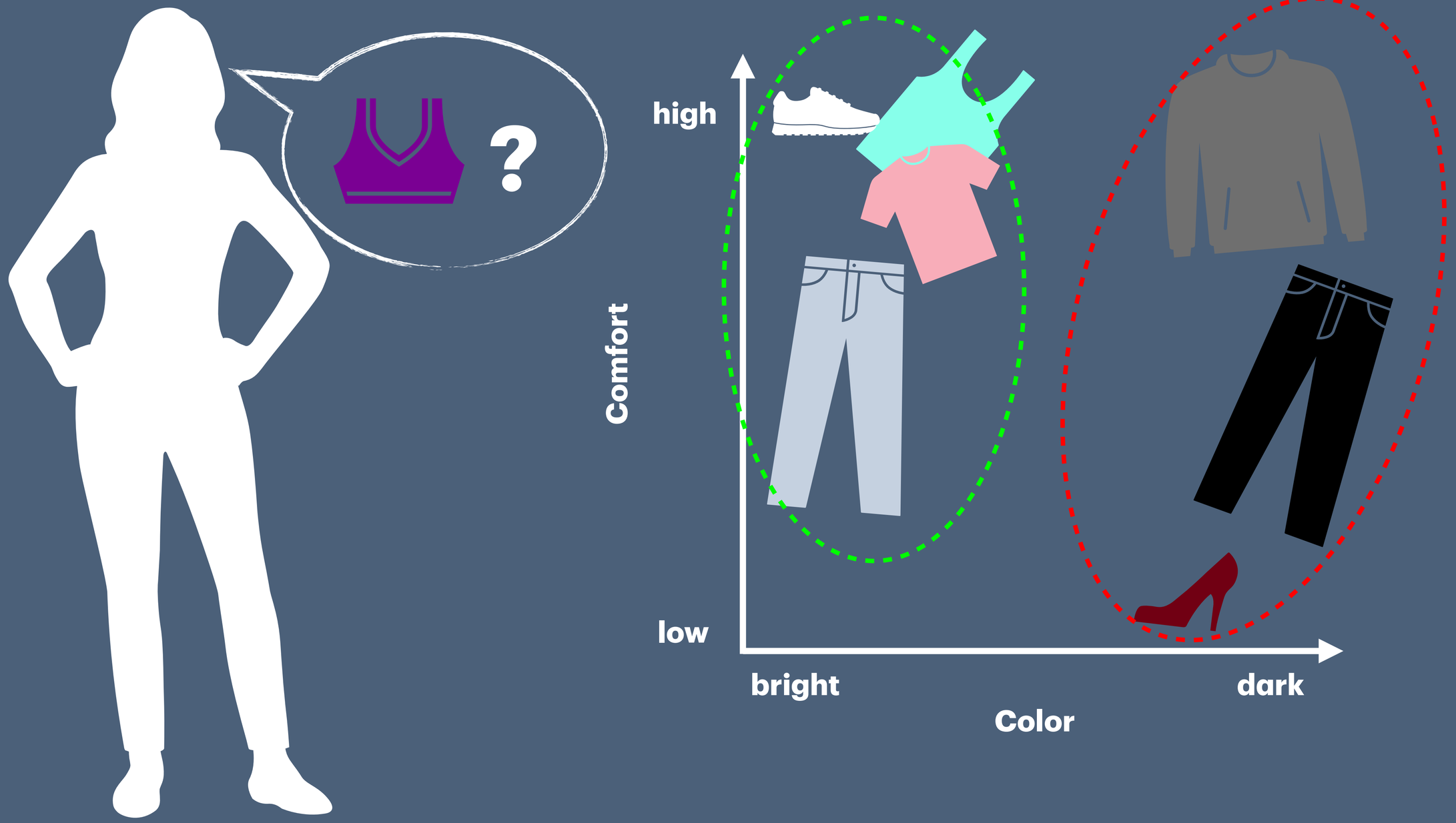
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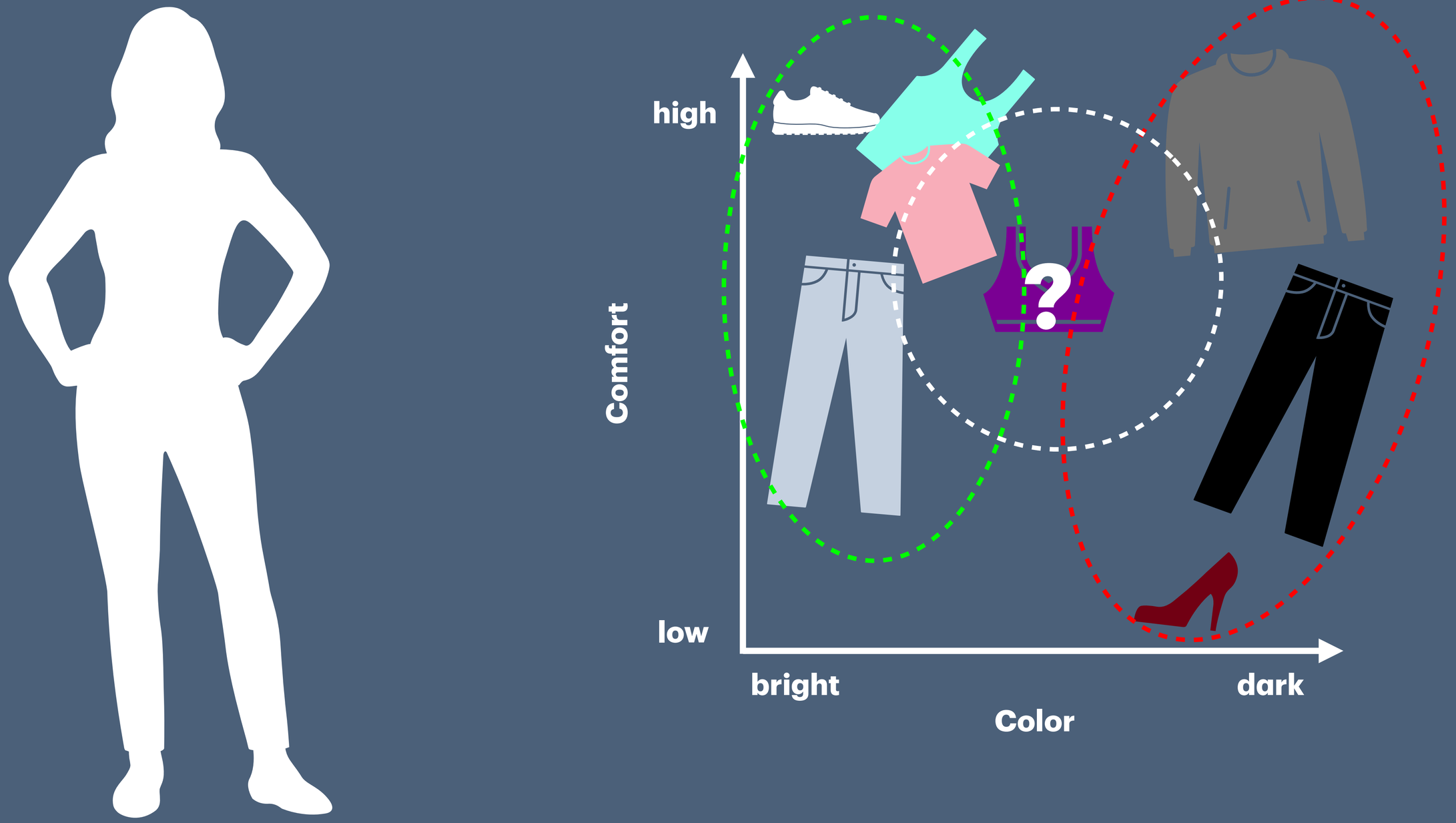
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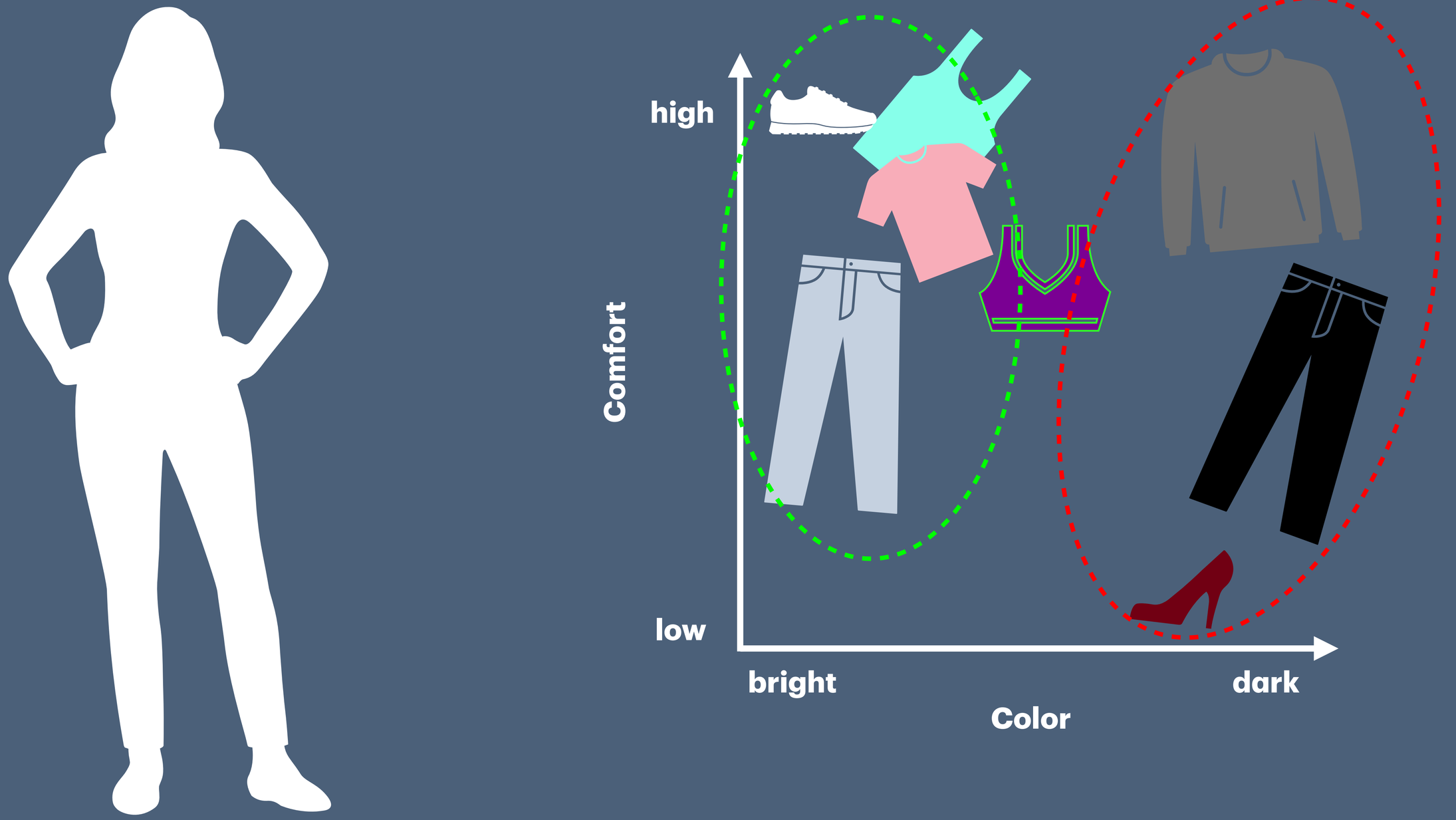
K-Nearest Neighbors
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Supervised machine learning

It’s a type of machine learning where model is trained on labeled dataset

Supervised machine learning algorithms:

- Regression algorithms
- Classification algorithms
- Neural networks
- Random forest algorithms

Supervised machine learning

- Regression algorithms
- Classification algorithms

Supervised machine learning

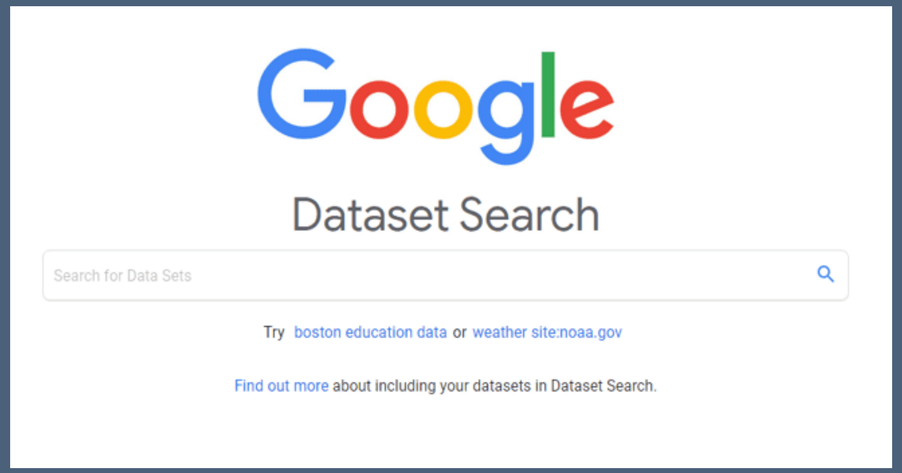
Regression:

- When what we want to predict is a continuous numerical value

Classification algorithms

- When what we want to predict is a category

Where to get data?


Google
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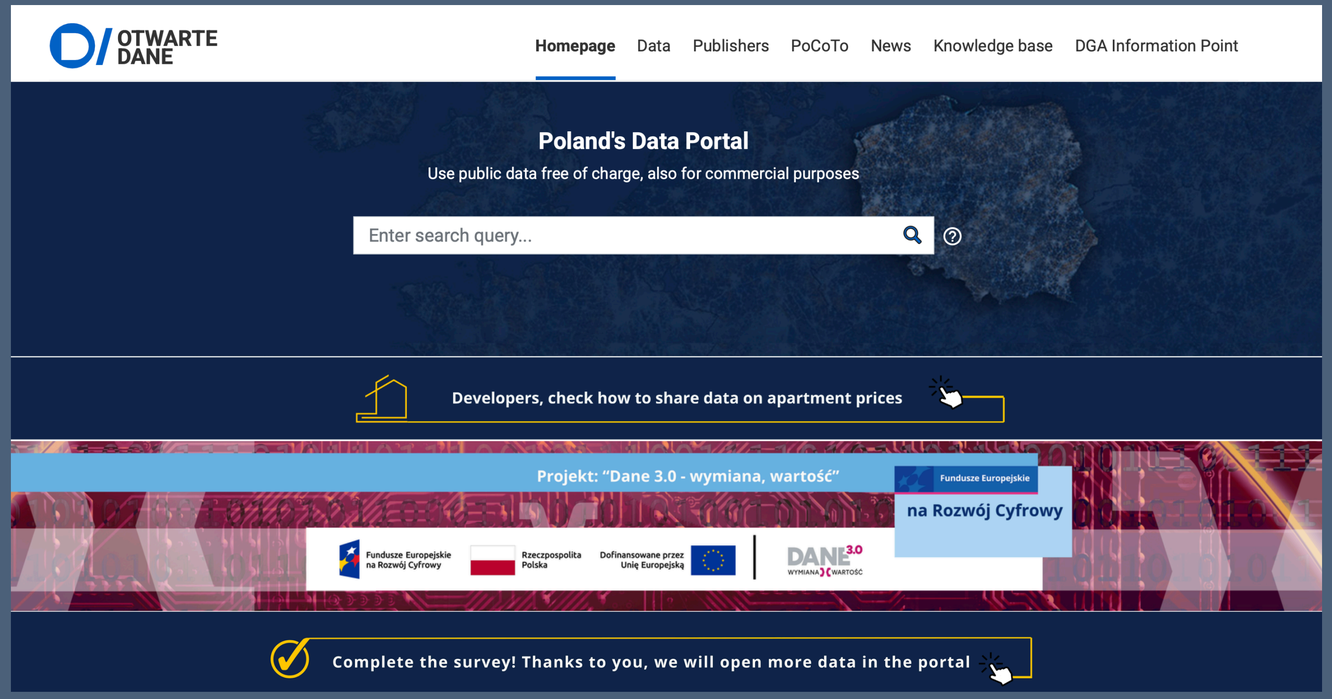
Find out more about including your datasets in Dataset Search.


kaggle™


DATA.GOV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DGA Information Point
Poland's Data Portal
Use public data free of charge, also for commercial purposes
Enter search query...
Developers, check how to share data on apartment prices
Projekt: "Dane 3.0 - wymiana, wartość"
Fundusze Europejskie
na Rozwój Cyfrowy
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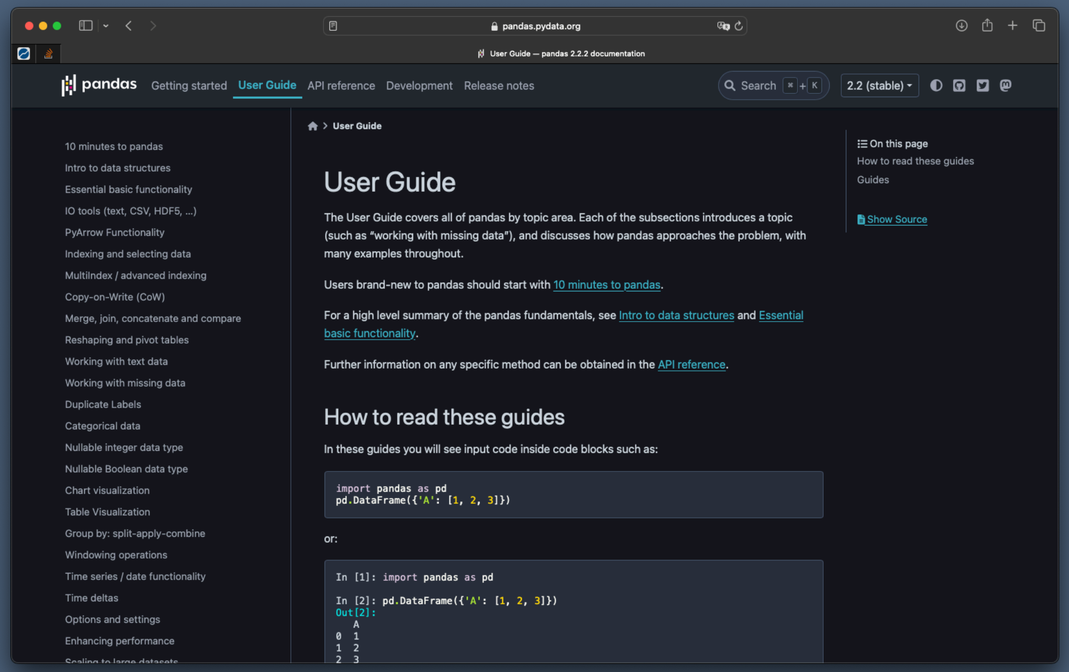
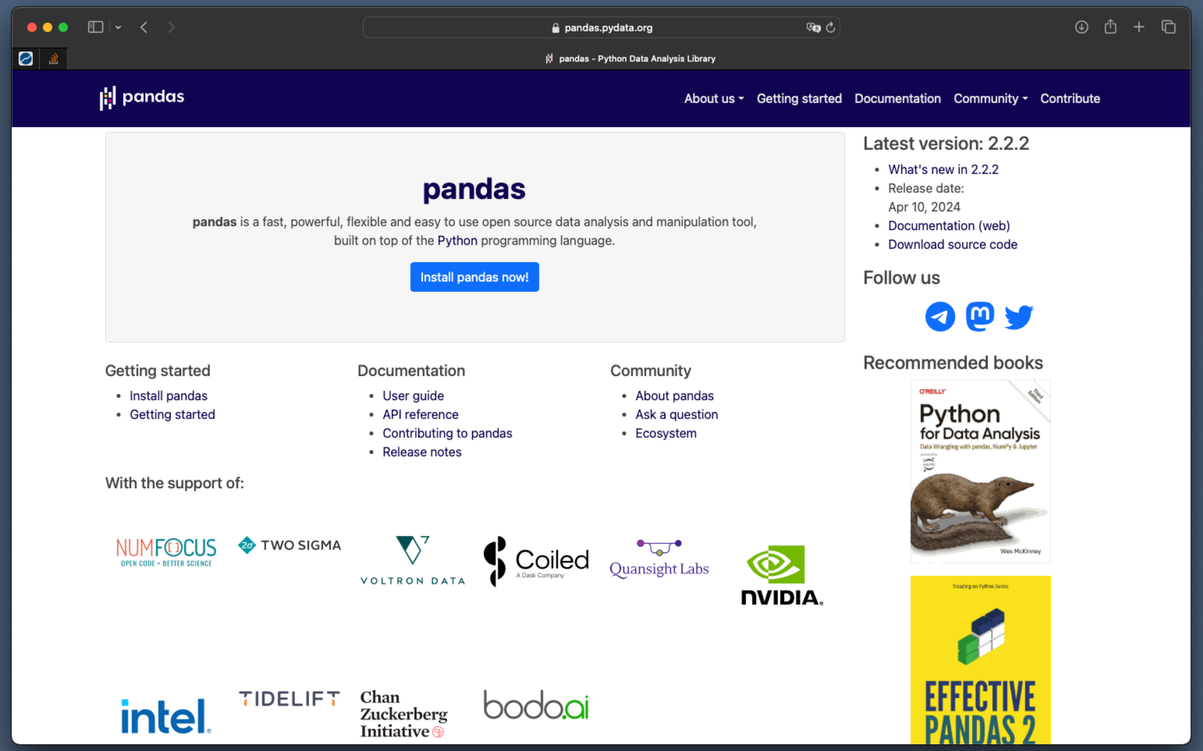
DANE 3.0
WYMIANA WARTOŚĆ
Complete the survey! Thanks to you, we will open more data in the portal

Tutorial

Pandas

Free and open source Python library for data manipulation and analysis.





https://github.com/jszydlowska/EuroSciPy2025.git