

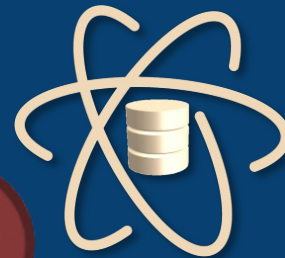
A hand is shown in the foreground, pointing towards a complex, futuristic digital interface. The interface features a large circular gauge with multiple concentric rings, some of which are illuminated with green and blue light. Inside the gauge, there are several interlocking gears. The background is dark and filled with various digital elements, including lines, dots, and abstract shapes, suggesting a high-tech or data-driven environment.

# Analogizers

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# ANALOGIZERS



Reasoning by  
analogy

Measuring  
Similarity

A hand is shown from the left, with the index finger pointing towards the right. The background is a dark blue, futuristic digital interface. It features a large circular gauge or clock face on the right side, with several interlocking gears visible within its center. The interface is overlaid with various data visualizations, including bar charts, line graphs, and a network of nodes connected by lines. The overall aesthetic is high-tech and digital.

# KNN – K nearest neighbors

# K-NEAREST NEIGHBORS (KNN)



Records represented as **points in the Euclidean space**

## Training algorithm

Store training records and wait

## Classification algorithm

For each new observation **Z** to be classified

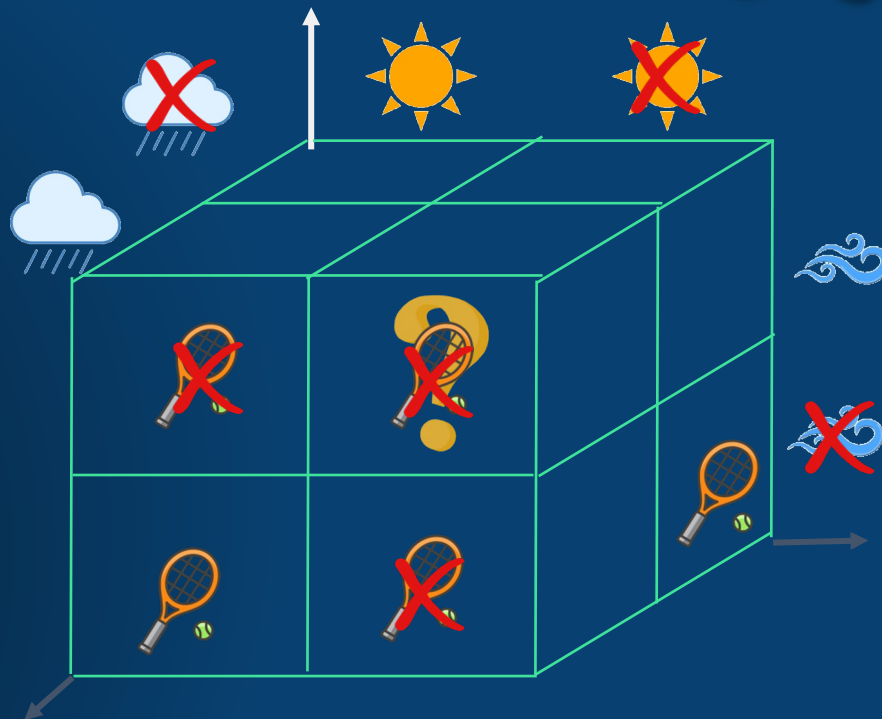
- choose **Z's k nearest neighbors**
- classify **Z** as **the majority of its neighbors**



# KNN ILLUSTRATION

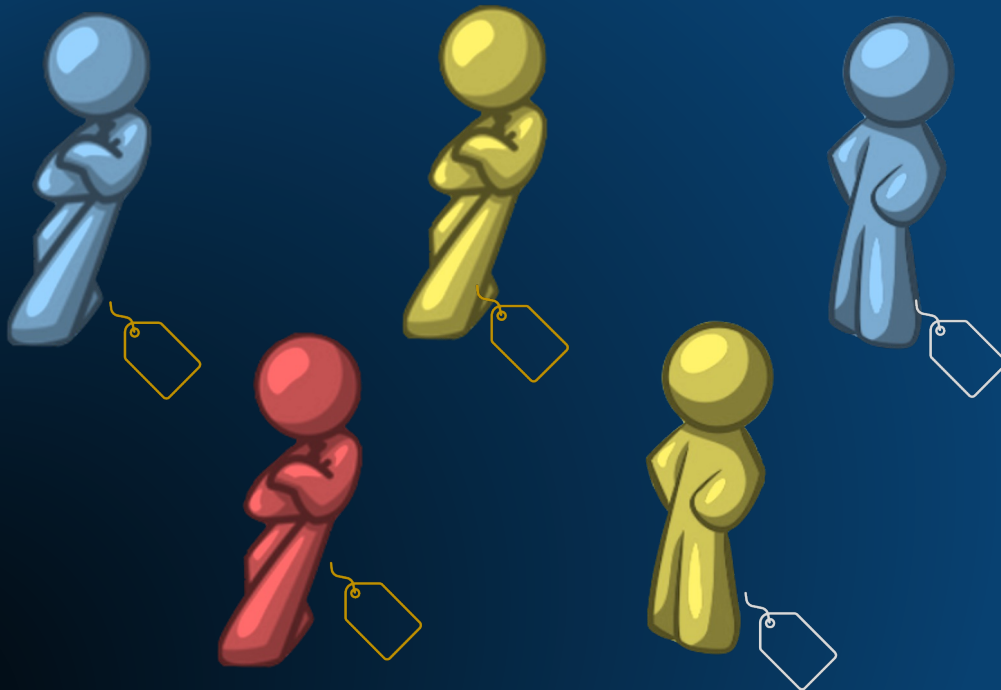


Dataset





# THE BEST NUMBER OF NEIGHBORS



# COMPARISON – SIMILARITY MEASURES





# SCALE TRANSFORMATION



Age	20
Income	35K per year

↔  
5000



Age	25
Income	40K per year

↔  
5000



Age	50
Income	35K per year

# REDUNDANT VARIABLES



Age	20
Income	35

$$\longleftrightarrow \sqrt{5^2 + 5^2}$$



Age	25
Income	40

$$\longleftrightarrow \sqrt{25^2 + 5^2}$$



Age	50
Income	35

# FEATURE SELECTION



$$\sqrt{5^2 + 5^2 + 5^2}$$

Age	20
Income	35
Job	35



$$\sqrt{25^2 + 5^2 + 5^2}$$

Age	25
Income	40
Job	40



Age	50
Income	35
Job	35





*Thank  
you!*

