LECTURE 3: AI/ML BASIC CONCEPTS

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OVERVIEW

1. A gentle introduction

2. Supervised ML techniques

    - Regression

    - Classification

3. Unsupervised ML techniques
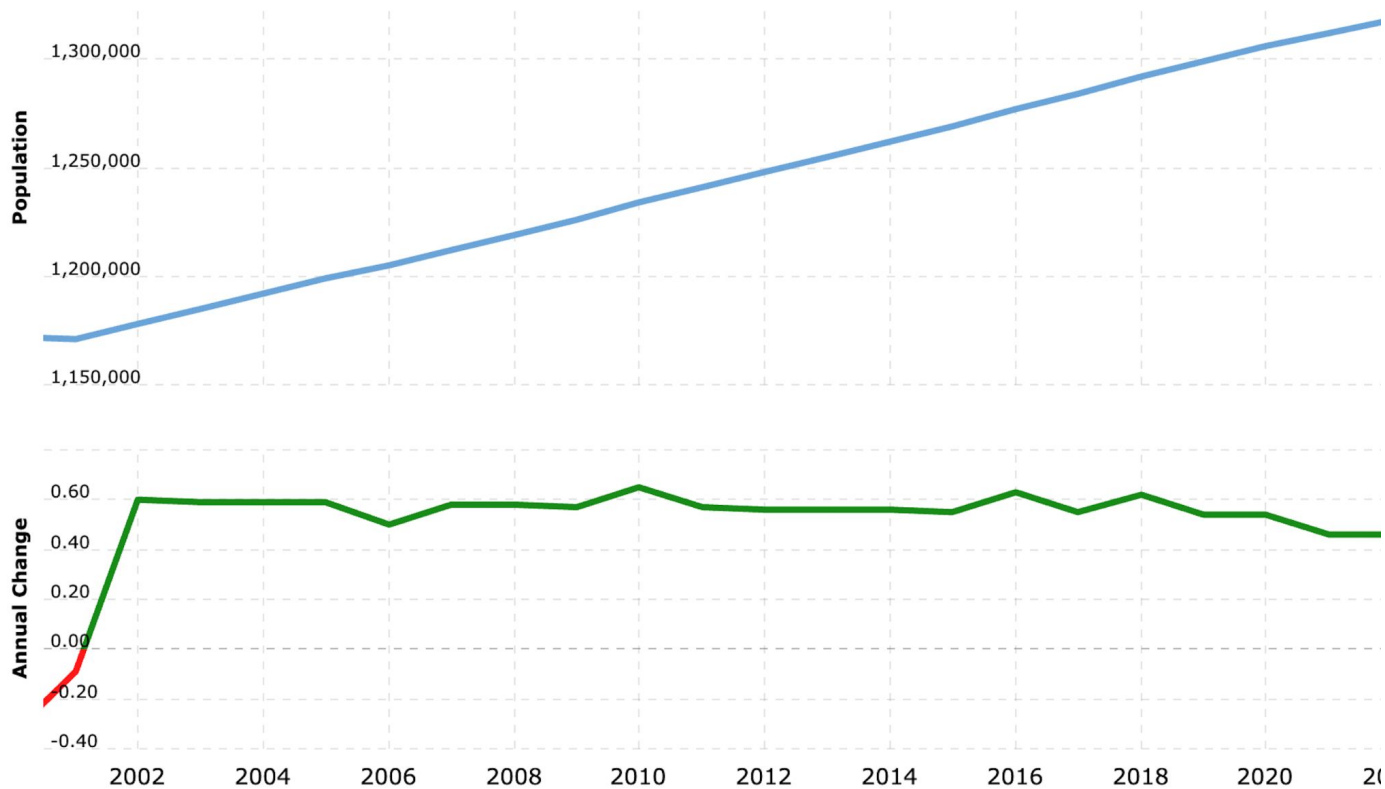
    - Clustering

    - Dimensionality Reduction

MATERIAL

1. Slides for some theory
2. Jupyter notebooks for a more practical approach (+ assignments!)

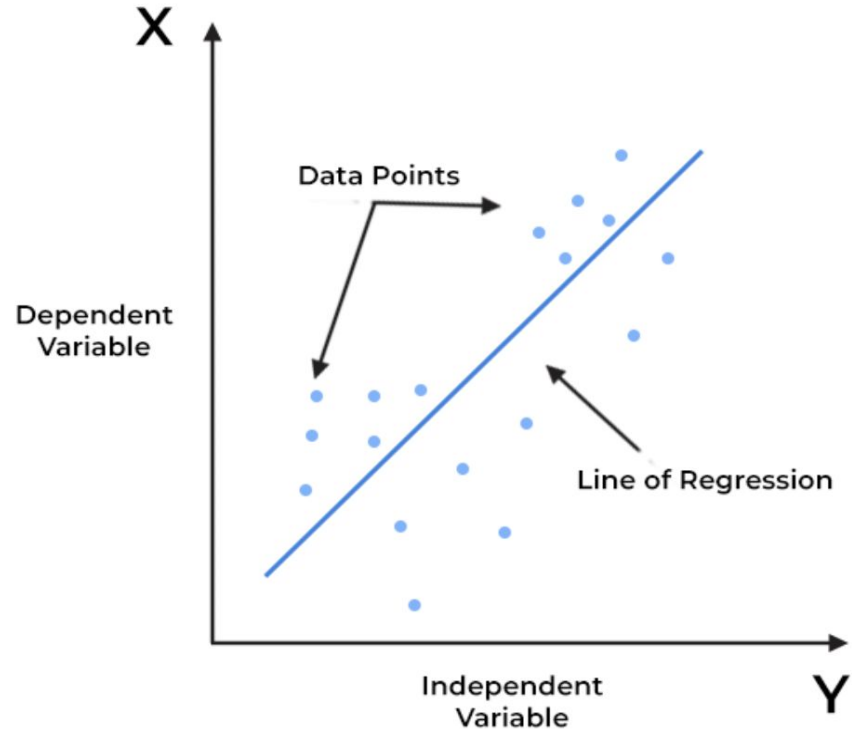# SUPERVISED ML

## LINEAR REGRESSION & LOGISTIC REGRESSION

01

LINEAR REGRESSION

LINEAR REGRESSION (REGRESSION)

- Goal: predict target (y) given features (X).
- y is a numeric (real) number
- The model is y=aX + b
- Need to estimate a (slope) and b (intercept).

LOGISTIC REGRESSION (CLASSIFICATION)

- Still y = ax + b!
- But linear function is
  Transformed to an S-shape.
- Output is a class
  (e.g. 'cat', 'dog', 'weasel'..)

Logistic Regression

y = 1

Y

S-shaped curve

Predicted Y lies between 0 and 1 range

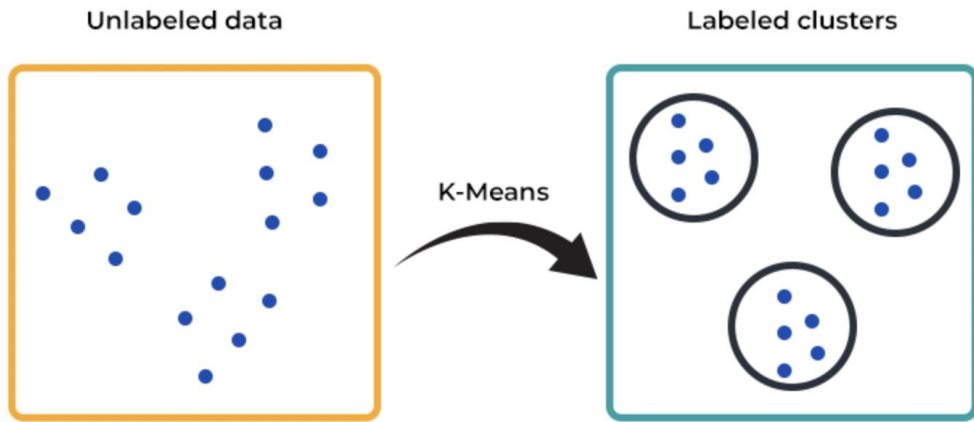y = 0

X
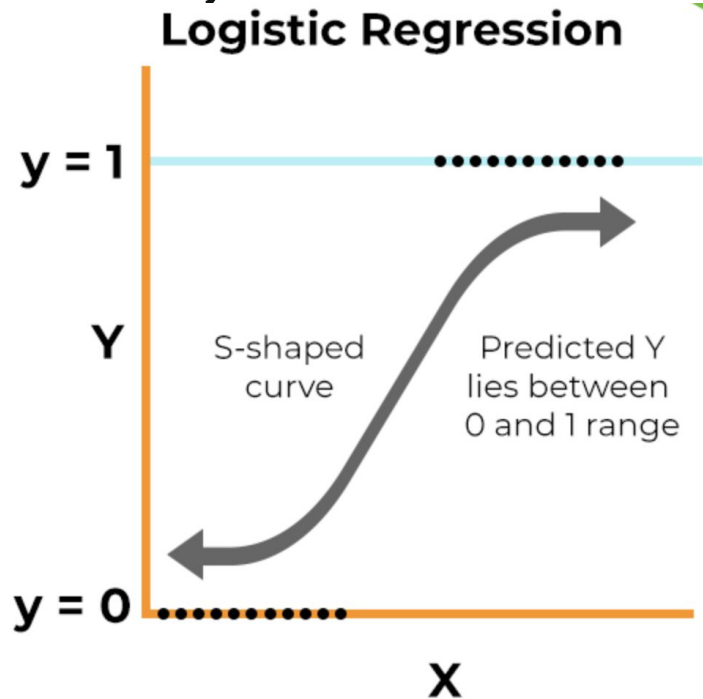
UNSUPERVISED ML
K-MEANS CLUSTERING

02

K-MEANS CLUSTERING

- Pick number of centers
- Put centers randomly in the space.
- Calculate closest points to centers
- Move center to the center closest points
- Repeat until centers are stable.
- Visualization: https://www.youtube.com/watch?v=5I3Ei69I40s

K-MEANS

Unlabeled data

K-Means

Labeled clusters

THANK YOU!

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QUESTIONS

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