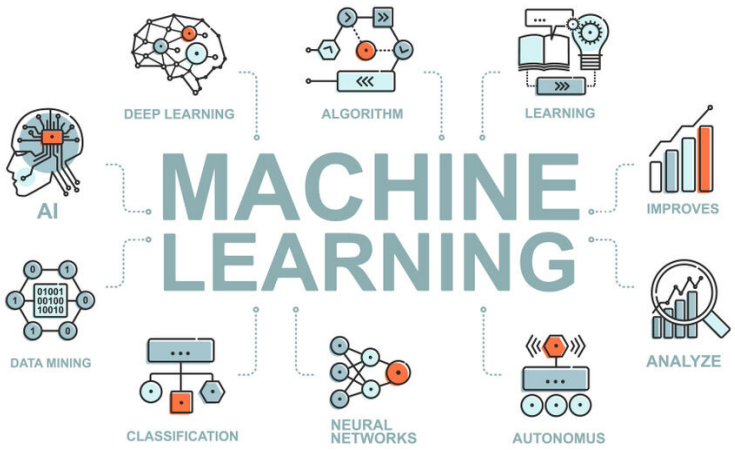
Yapay Zeka ve Python Programlama

Emir Öztürk

Makine Öğrenmesi

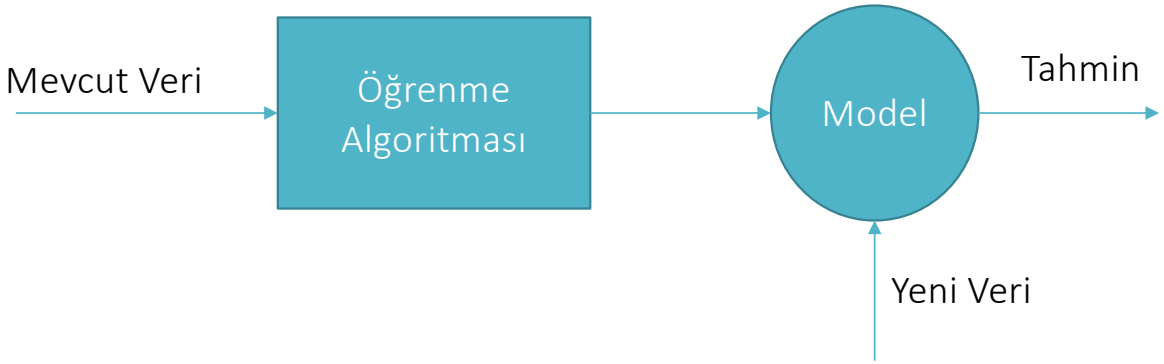
•Makine Öğrenmesi
- Geçmiş verilerden öğrenme (Training Data)
- Matematiksel modeller
- Tahmin



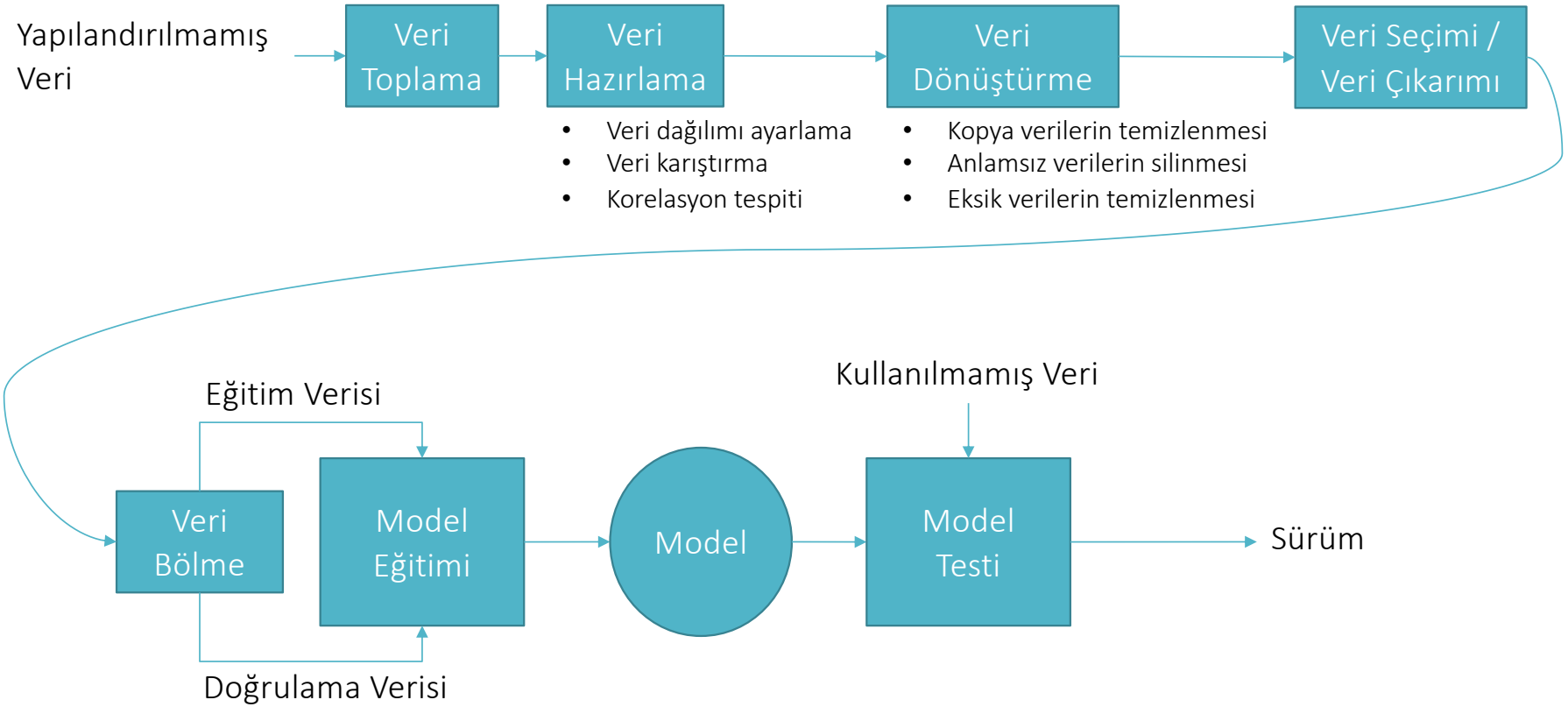
Makine Öğrenmesi – Kullanım Alanları

- Görüntü işleme / Tanıma
  - Yüz tanıma
  - Medikal resimler / Hastalık tespiti
- Ses işleme / Tanıma
- Trafik verisi
  - Trafik lambaları
  - Araçlar
  - Yayalar
- Ürün önerisi / Satış desteği
- Saldırı / Spam / Virüs tespiti
- Karar destek sistemleri
- Doğal Dil işleme
  - Çeviri
  - Özetleme
  - Soru cevaplama

Makine Öğrenmesi

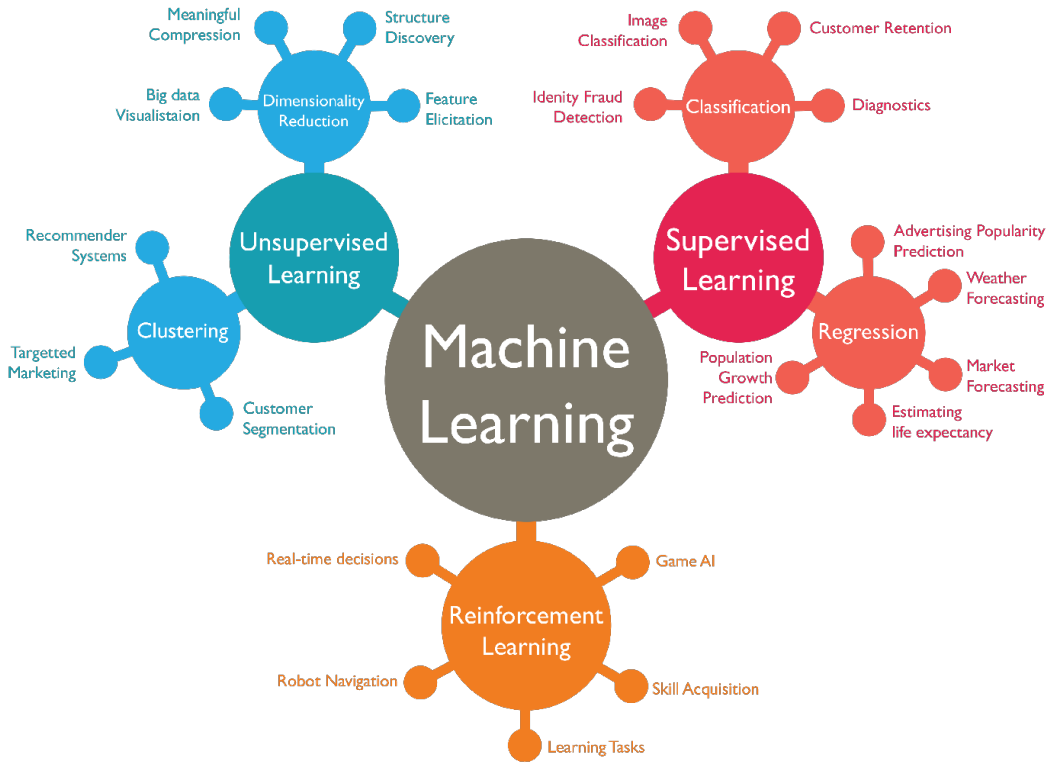


Makine Öğrenmesi



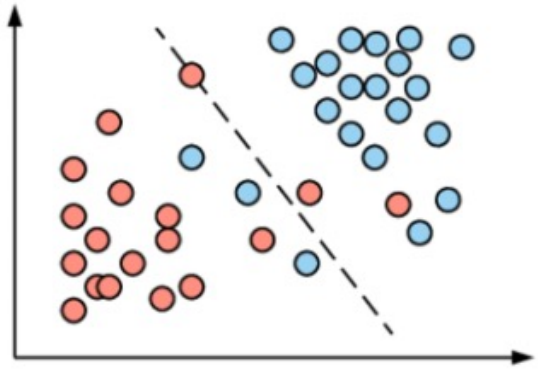
Öğrenme Çeşitleri

- Supervised
- Unsupervised
- Reinforcement



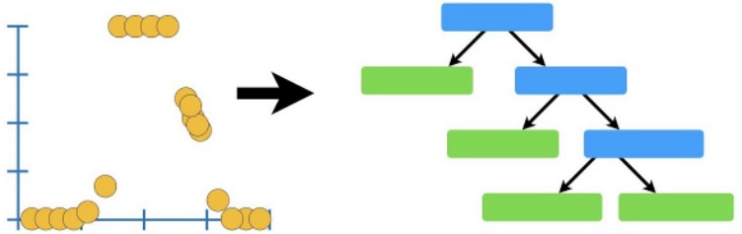
Supervised Learning

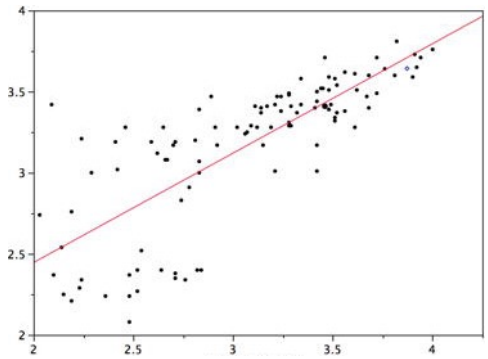
- Girdi verisinin bir fonksiyon ile çıktı verisine haritalanması
- Etiketlenmiş veri ihtiyacı
- Etiket tahmini
- Regresyon (Regression)
- Sınıflandırma (Classification)

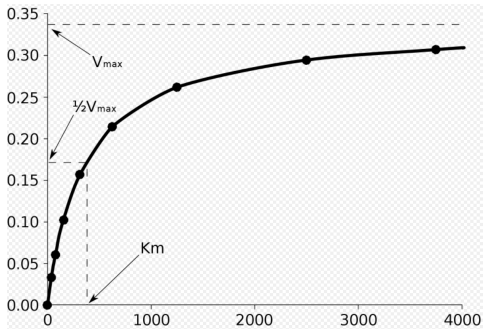


Regresyon

- Sürekli verilerin tahmini
- Belirli değer girdi-çıktı ikililerinin arasındaki fonksiyonun tespiti
- Lineer regresyon
- Regresyon ağaçları
- Non-lineer regresyon
- Polinomiyal regresyon

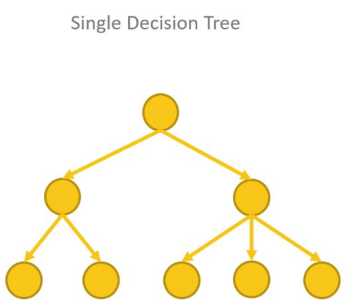


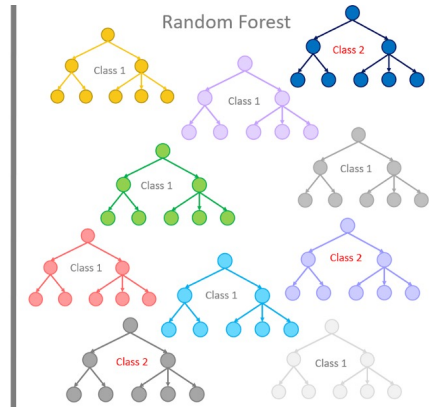


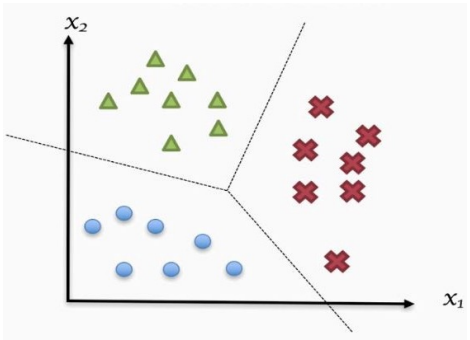


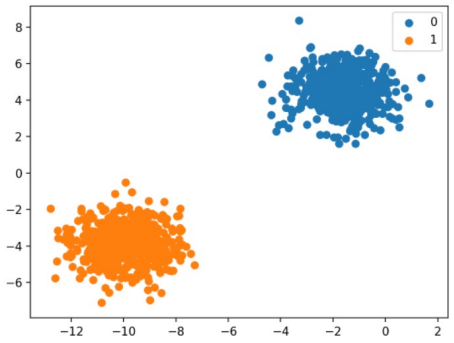
Sınıflandırma

- Kategorik (Nominal) değerlerin tahmini
- Verilerin özelliklerine göre dahil olduğu sınıfın tespiti
- Sınıflandırma türü
  - Binary
  - Multiclass
- Karar ağaçları
- Lojistik regresyon
- Random forest
- Karar destek makineleri



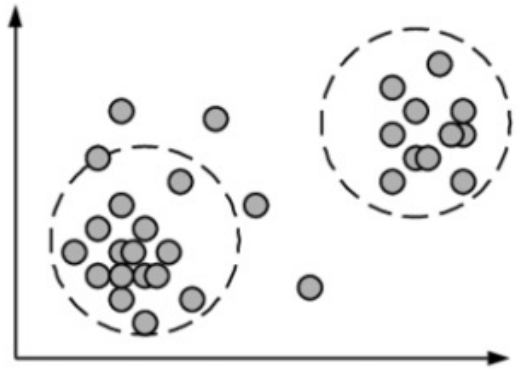






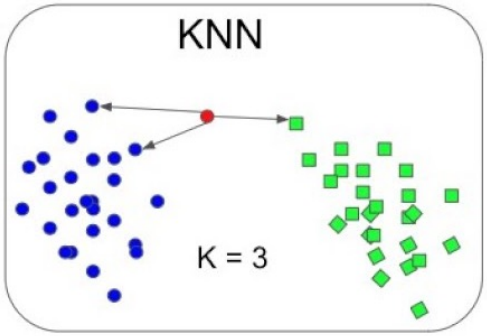
Unsupervised Learning

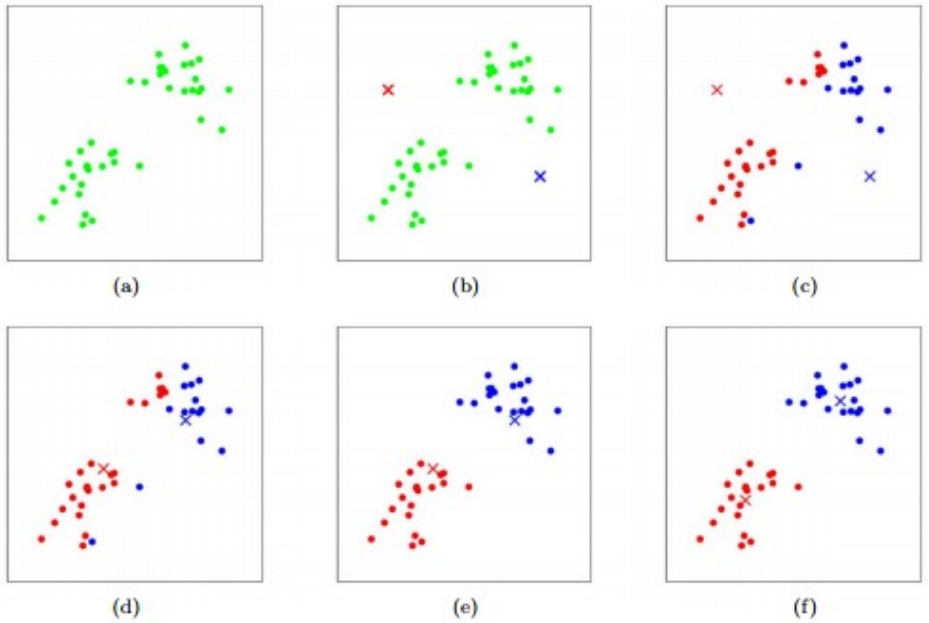
- Etiketsiz veri ihtiyacı
- Grup sayısı verilmeli
- Kümeleme (Clustering)
- Atama (Association)



Unsupervised Learning

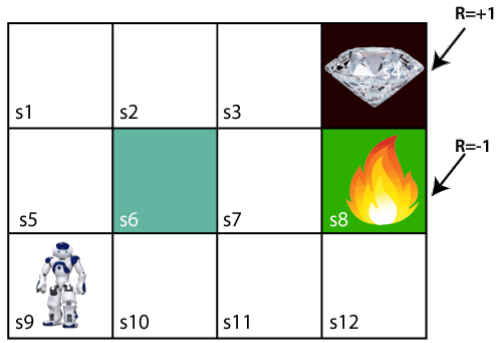
- K-means
- KNN



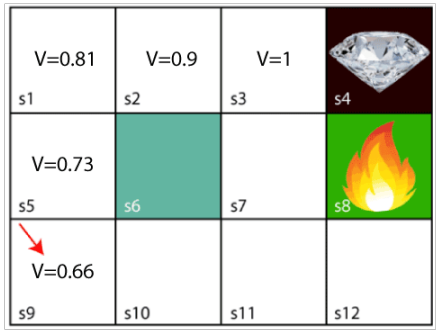


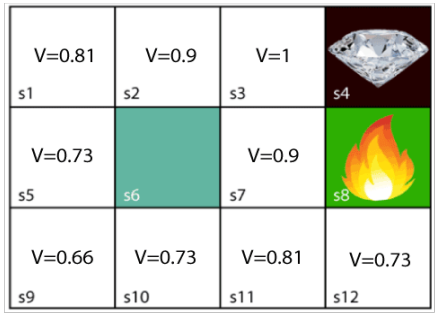
Reinforcement Learning

- Veri ihtiyacı yok
- Ödül fonksiyonu tanımı
- Ödülün maksimize edilmesi
- Yanlış hareketlerin cezalandırılması



$$V(s) = \max [R(s,a) + \gamma V(s`)]$$





Reinforcement Learning

State-action-reward-state-action

Q-Learning

Deep Q-Networks