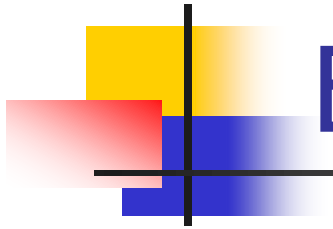


Example: concrete property prediction

- Build a strength prediction model based on laboratory tests on 425 specimens.
- Compressive strength: important property of concrete
- Regression or classification?
  - Model the strength as a function of concrete components

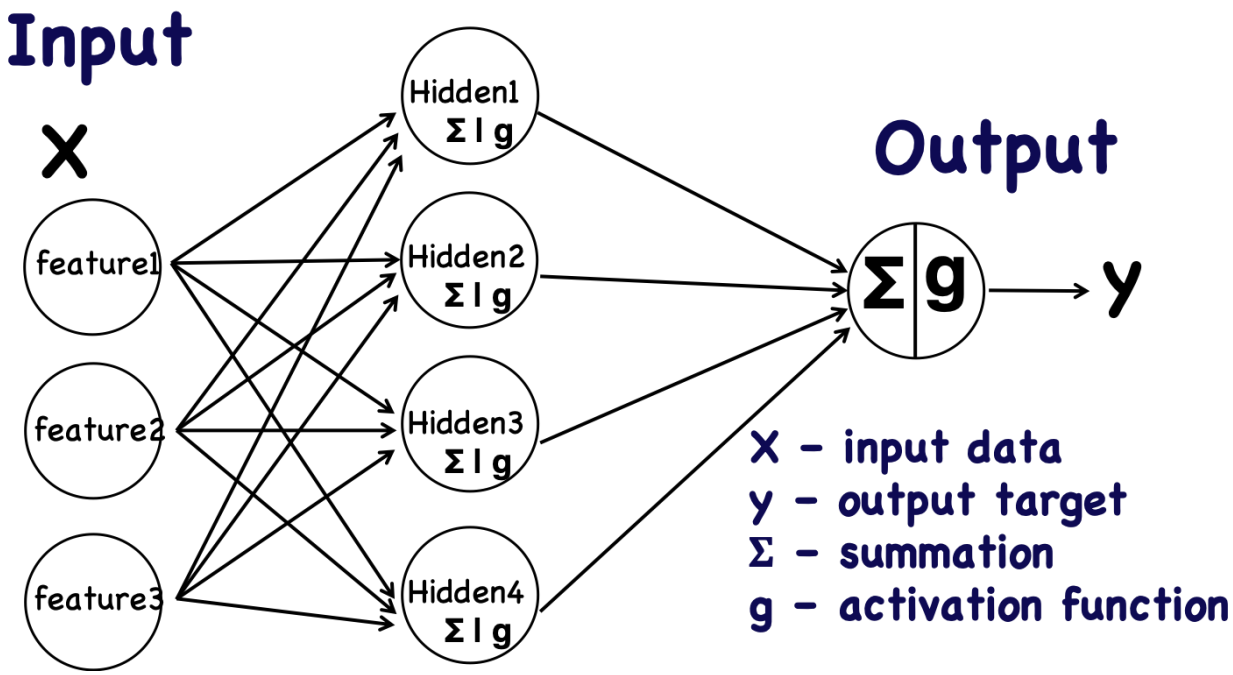
https://www.neuraldesigner.com/learning/examples/concrete-properties-assesment/

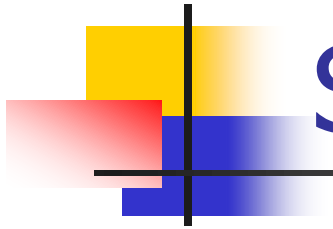
Dataset: features vs. target

- Features: densities of different materials
  - cement, in kg/m3.
  - blast_furnace_slag, in kg/m3.
  - fly_ash, in kg/m3.
  - water, in kg/m3.
  - superplasticizer, in kg/m3.
  - coarse_aggregate, in kg/m3.
  - fine_aggregate, in kg/m3.
- Target: compressive_strength, in MPa.

Build an ANN to predict strength

- X consists of all the features (i.e., the densities)
- y is the predicted strength





Scaling of the data

- Scale the input feature and target between [-1, 1]
  - X_scale = - 1 + (X – Xmin)/(Xmax-Xmin) * 2
- Train using the scaled data
- Un-scale the output back:
  - Y = Ymin + Y_scale * (Ymax – Ymin)