# Bertelsmann Tech scholarship - neural networks:

* Lesson 3: Introduction to neural networks
  + Classification problems – creating a division between data sets and being able to place new incoming data into the appropriate group
  + Boundaries between data can be linear or non-linear
  + Linear boundary:  
      
    w1x1+w2x2+w3x3+…. +wnxn+b=0  
    Matrix notation: Wx+b

Prediction y^ = 1 if Wx+b >= 0 else y^ = 0

* + Neural networks simulate human thinking using perceptron, weights and bias
  + Perceptrons compute weighted sum of inputs and then apply an activation function to transform this sum into the desired output
  + They can be used to implement logical operations
  + Perceptron algorithm: Every mis-classified point asks the boundary line to come closer to it so that it can fall in the correct region
  + A screenshot of a cell phone

    Description automatically generated
  + Error function: describes how much the predicted value differs from actual value
  + Different activation functions, loss functions and optimization algorithms