- ***About Tensorflow***
  - -> an open source Python framework for machine learning
  - -> machine learning in Python
- ***AI vs neural networks vs machine learning***
  - -> there are concepts and then there is the coding
  - ***Artificial intelligence***
    - -> a more popular topic
    - -> less people actually understand it
    - -> "the effort to automate intellectual tasks normally performed by humans"
      - -> AI is something which automates tasks using machines
    - history
      - -> can computers think?
        - from code to 'thinking' and getting technology to make decisions
      - -> AI was a set of rules
        - e.g rules for a game which the computer executed
        - -> there were no learning algorithms the computer could follow
        - -> AI was a lot of different rules which the machine would follow - to automate the decision making
        - -> those rules can be simple or complex -> e.g a tick tack toe game could be considered AI
      - -> simulating a game and making decisions based off of the rules
        - -> simulating an intellectual human behaviour -> this could be a very simple one
  - ***Machine learning***
    - -> this is a subset of AI -> it's an example of an AI
    - -> AI is a set of rules -> the data is analysed with the rules and then a decision is made
    - -> machine learning figures out the rules -> and with AI those rules are given
      - -> you need a lot of input data to train the model to figure out what those rules are
    - -> machine learning feeds the answers and the data and comes out with the rules - it's learning what the rules are
    - -> vs classical programming which is told what the rules are and data -> to then come out with the answers
    - -> they're predictive models -> which make mistakes
      - -> the aim is to train them to be as accurate as possible
    - -> machine learning vs AI is -> machine learning figures out the rules based off of the training data
      - -> the entire idea is to come up with predictive models
  - ***Neural networks (deep learning)***
    - -> these are a subset of machine learning -> i.e you give the model the data and it tunes itself
    - -> neural networks use layers of these data
    - -> each layer of the model is trained on data -> and this is using layers of that data
    - -> machine learning uses a input layer and an output layer
      - -> deep learning uses multiple layers
      - -> it's deep because there are many layers to the model
    - -> the different layers of the network transform the data -> we are running transformations on them in each layer of the network
    - -> multi-stage information extraction process
    - -> the transformations which are ran at each layer are initialised by training the model on a dataset
    - -> there are one or two layers in regular machine learning
    - -> they are not modelled after the brain
      - we don't know how a lot of that information happens and transfers in the brain

- ***Data***
  - -> data is used to train the machine learning models
  - -> datasets
  - -> students grades example
    - -> there are their three different grades throughout the year in a dataset
    - -> with three students
    - -> the model we want is
      - -> if given two of their grades, how do we predict the third?
      - -> there is input information -> the input information to the model is the 'features'
        - -> this is the information which is used to make predictions
    - -> the label of the model is the output -> features is input information and labels is output information
    - -> you need data with AI and ML -> a lot of different examples to train the model to come up with rules for the dataset
      - -> you need a dataset to train the model
      - -> then you give it an input -> which can be used to test it
      - -> the data which is used to train and test the model is very important to its accuracy