Natural Language Processing (or NLP) is applying Machine Learning models to text and language. Teaching machines to understand what is said in spoken and written word is the focus of Natural Language Processing. Whenever you dictate something into your iPhone / Android device that is then converted to text, that’s an NLP algorithm in action.

You can also use NLP on a text review to predict if the review is a good one or a bad one. You can use NLP on an article to predict some categories of the articles you are trying to segment. You can use NLP on a book to predict the genre of the book. And it can go further, you can use NLP to build a machine translator or a speech recognition system, and in that last example you use classification algorithms to classify language. Speaking of classification algorithms, most of NLP algorithms are classification models, and they include Logistic Regression, Naive Bayes, CART which is a model based on decision trees, Maximum Entropy again related to Decision Trees, Hidden Markov Models which are models based on Markov processes.

A very well-known model in NLP is the Bag of Words model. It is a model used to preprocess the texts to classify before fitting the classification algorithms on the observations containing the texts.

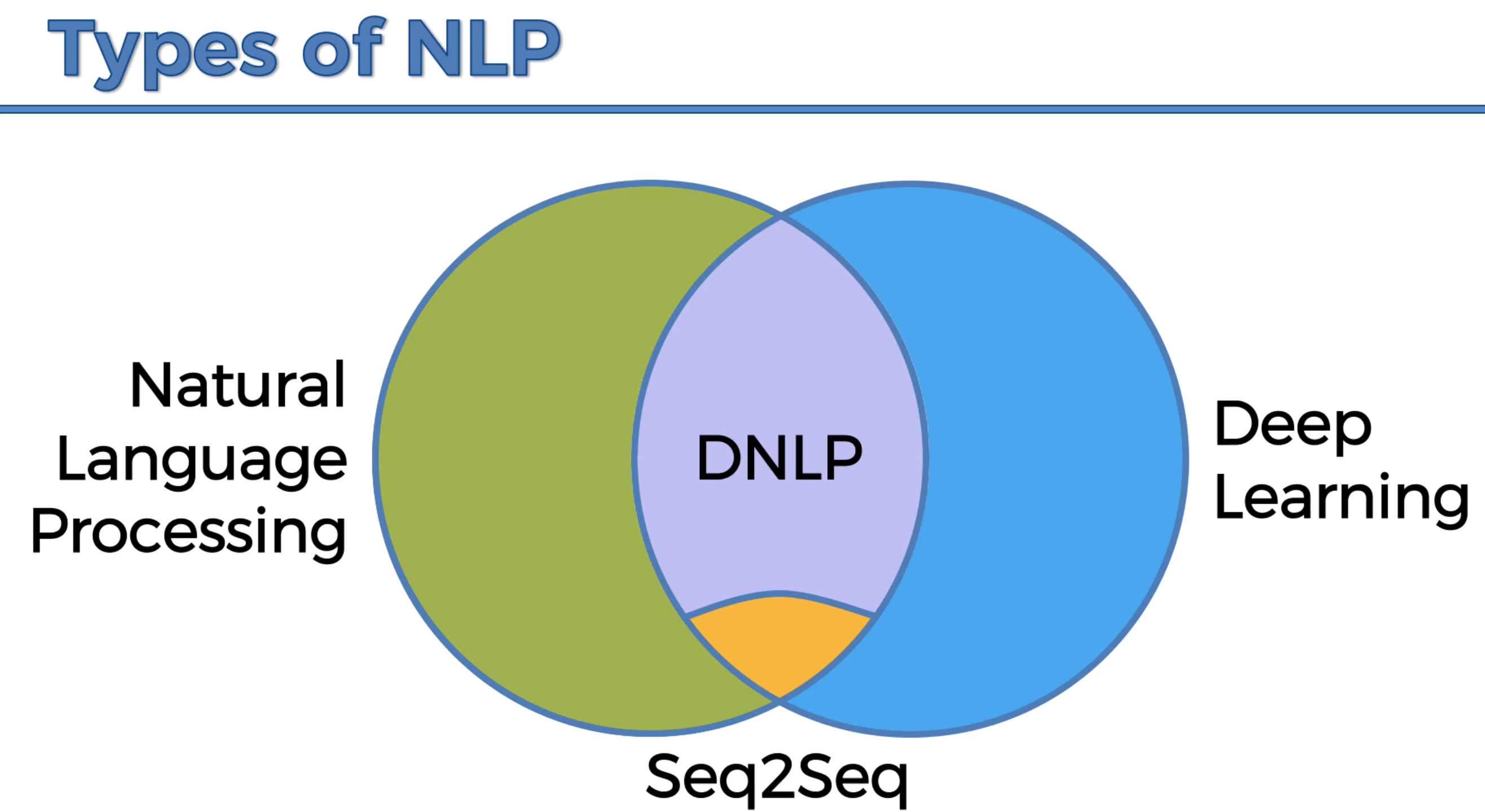
Types of Natural Language Processing

Classical vs Deep Learning Models

Bags-of-Words Model

Seq2Seq or Chatbots – Deep Learning and NLP A-Z

Types of Natural Language Processing

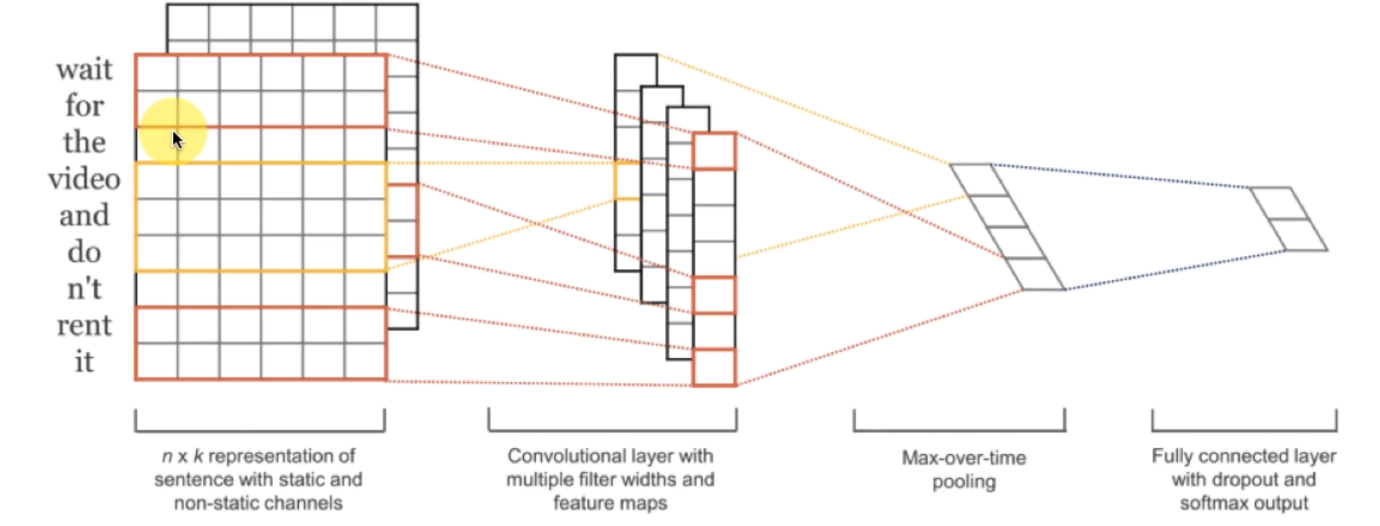
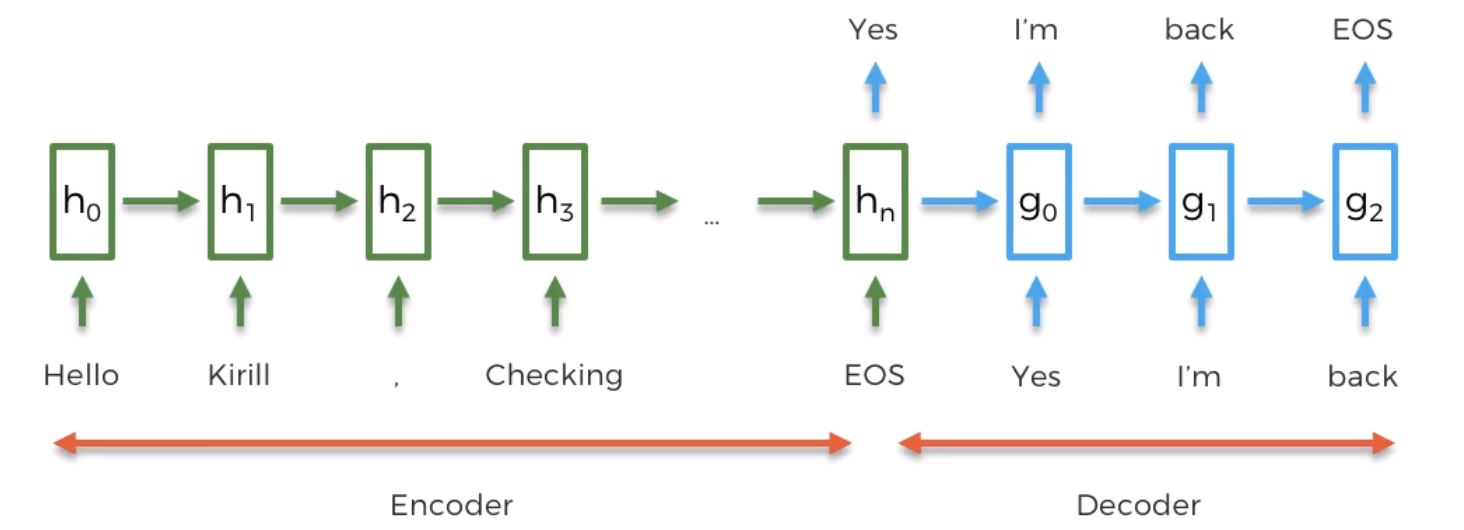


Seq2Seq – most cutting edge natural language processing models

Different examples of ChatBots.

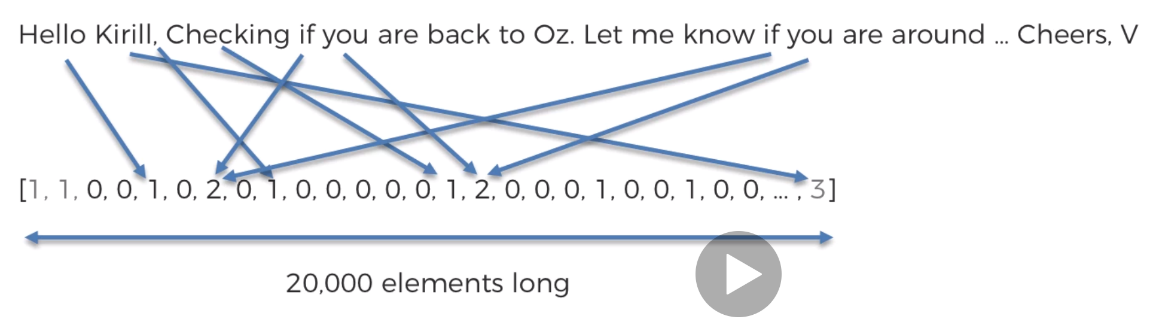
Classical vs Deep Learning Models

Some Examples:

1. If/Else Rules (Chatbot) – NLP
2. Audio Frequency components analysis (Speech Recognition) – NLP, use fourier transformation to generalise and look at frequencies and compare against with the mathematical calculation in our library.
3. Bag-of-words model (Classification) – NLP area
4. CNN for text Recognition (Classification) – DNLP area
5. Seq2Seq (many applications)

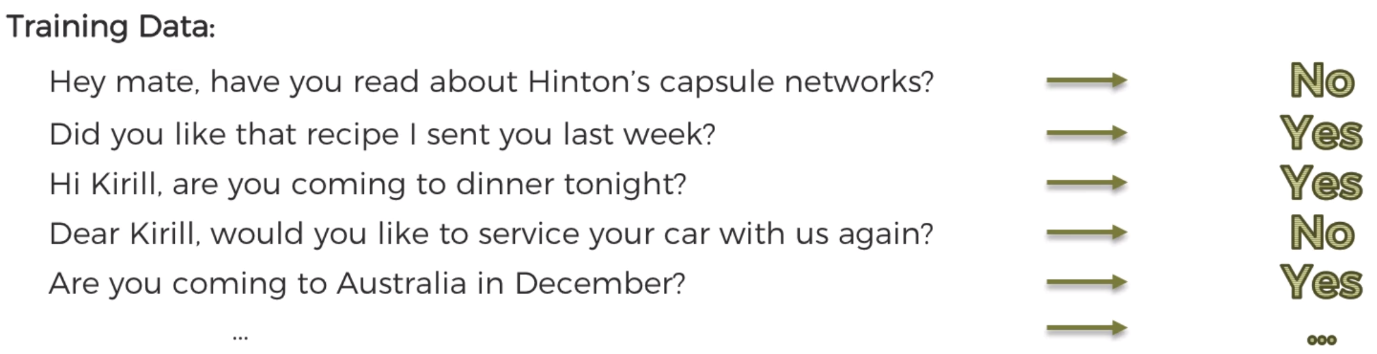
**Bags-of-Words** Model

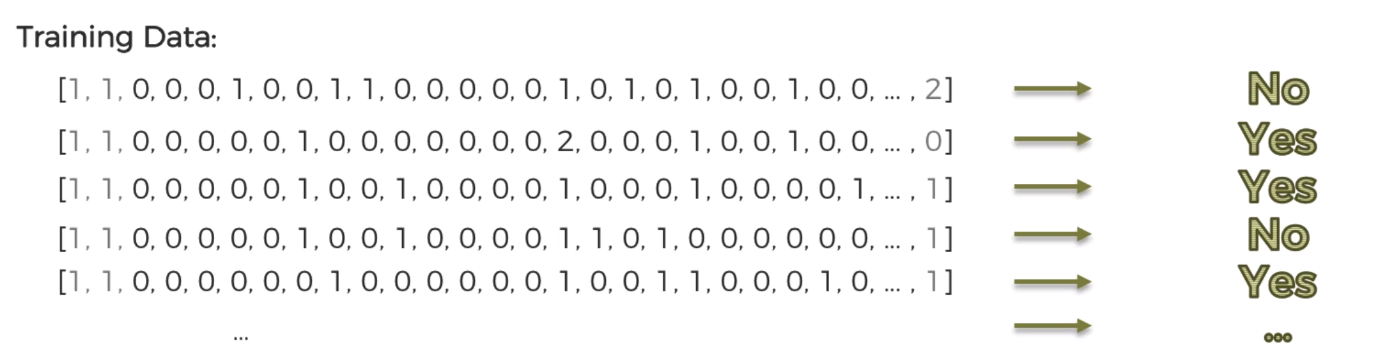
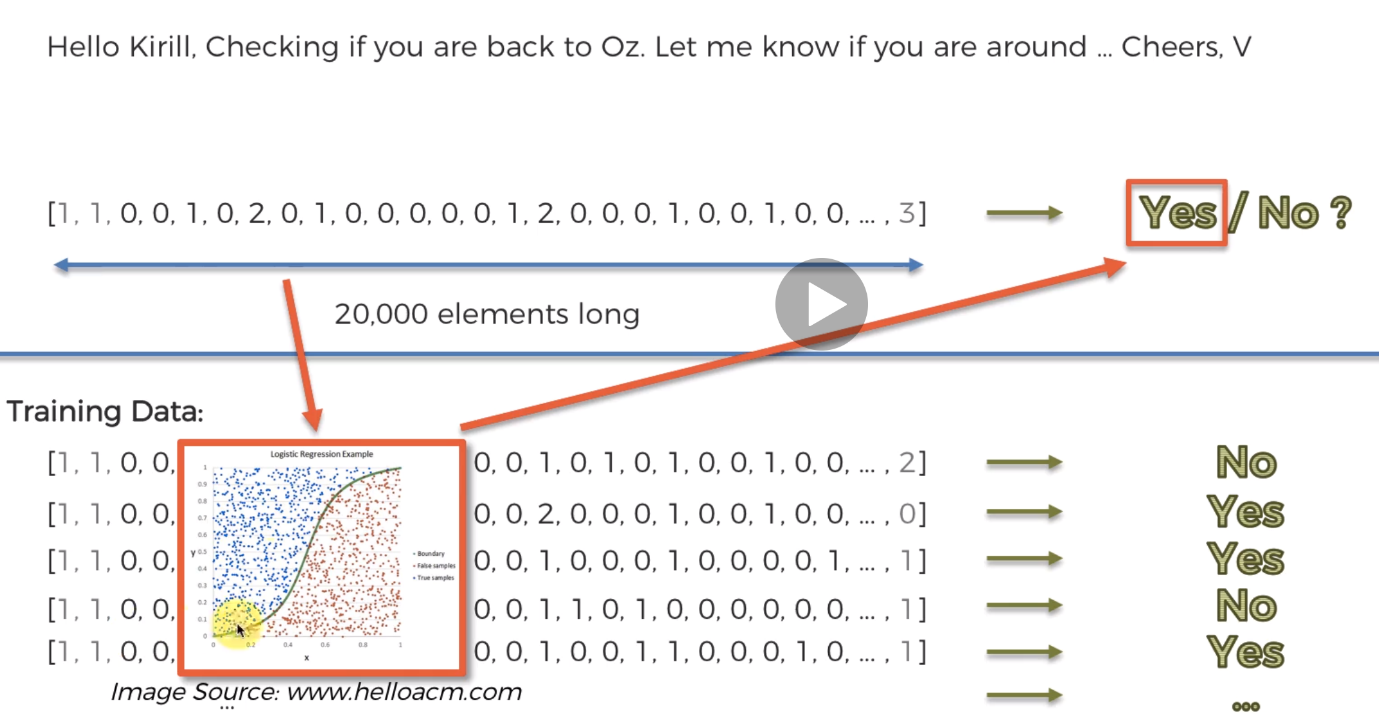
Start off with a vector full of zeros [0,0,0,0,,….0,0,0,] 20,000 element long Because native test-takes 171,476 words, around 20,000 to 35,000 words.

The first two numbers are Start of Sentence SOS, and End of Sentence EOS

That vector will change.

Goal – is to answer with a reply, Yes/No in a form of a Vector. By Going through Training Data.

Change it into a vector and apply a Logistic Regression Model

And input the message to predict if he would like to say Yes or No

Or we could use a Neural Network contain Hidden Layers as we want then output layer into Yes. Which will be classified as Deep Natural Language Processing Algorithm