

MACHINE LEARNING



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BEGINNING

SO MY MACHINE LEARNING JOURNEY STARTED FROM IIT(ISM) DHANBAD ITSELF ,BEFORE THAT I THOUGHT OF MACHINE LEARNING AS IT WILL BE SO ,LIKE FASCINATING THING TO DO ,I MEAN HOW CAN WE TEACH A COMPUTER OR A MOBILE THAT WHAT ARE WE THINKING .

- HOW CAN YOUTUBE PREDICT WHAT I LIKE TO WATCH ?
- HOW DOES ALL THIS REELS FEEL SO RELATABLE?
- HOW DOES GOOGLE KNOWS WHAT NEWS TO TELL ME?

WITH ALL THESE QUESTIONS THROBBIG IN MY MIND GAVE ME A CURIOSITY A MOTIVATION TO START MACHINE LEARNING AND THANKS TO CYBERLABS OF MY COLLEGE I GOT THE CHANCE TO EXPLORE THIS FIELD

PYTHON

I started my journey by learning basic concepts of Python libraries like numpy and pandas .Though i studied them thoroughly during my school period it was not a very difficult task. I read the documentation of numpy and revised all the basic concepts of array,slicing of array array multiplication and other algebraic operations on array.I also learnt a lot of new concepts on the way .For example while building n layer neural network I learnt the concept of dictionary and use of string.

ALGORITHMS

THE ALGORITHMS I
LEARNT DURING THE
JOURNEY ARE -----

- LINEAR REGRESSION
- POLYNOMIAL REGRESSION
- LOGISTIC CLASSIFICATION
- KNN CLASSIFICATION
- NEURAL NETWORK

LINEAR REGRESSION

This is the first model which I learnt .I studied about it through coursera course of Sir Andrew NG .the most difficult part for me was to get a intuition of gradient descent in this model .It took me 2 days just to visualise the gradient descent . I have used vectorization in the code to make it faster.

I used the data set provided by my mentors and my
ACCURACY was 81%

POLYNOMIAL REGRESSION

This was according to me was the toughest model to make and still I didn't get any satisfactory accuracy on this model.

In this model I created a loop that can produce all possible combination of powers possible in three variable where the degree is given by the user

As the dataset provided to us consisted of three input variables .

Despite all my effort i cant improve its accuracy

I used the data set provided by my mentors and my

ACCURACY was 30 %

LOGISTIC CLASSIFICATION

I also faced failure in this model I understood all the concepts clearly and written the code but i didnt get the accuracy right even in this code i spent day and night trying to get its accuracy right but I can't do it.

I shown my code to my mentor and he said that there is no problem with my code but the problem is that my code somehow raises probablity of all the variables to approximately 1 but ideally only one variable's probablity should be raised due to which the accuracy drastically decreases .I tried every thing to improve this code I also did regularization but still it didnt work out

I used the data set provided by my mentors and my
ACCURACY was 9.6 %

KNN CLASSIFICATION

K Nearest Neighbour is a classification model in which training the model on dataset is not required .This model measures the distance of input to all the other points present on the dataset.

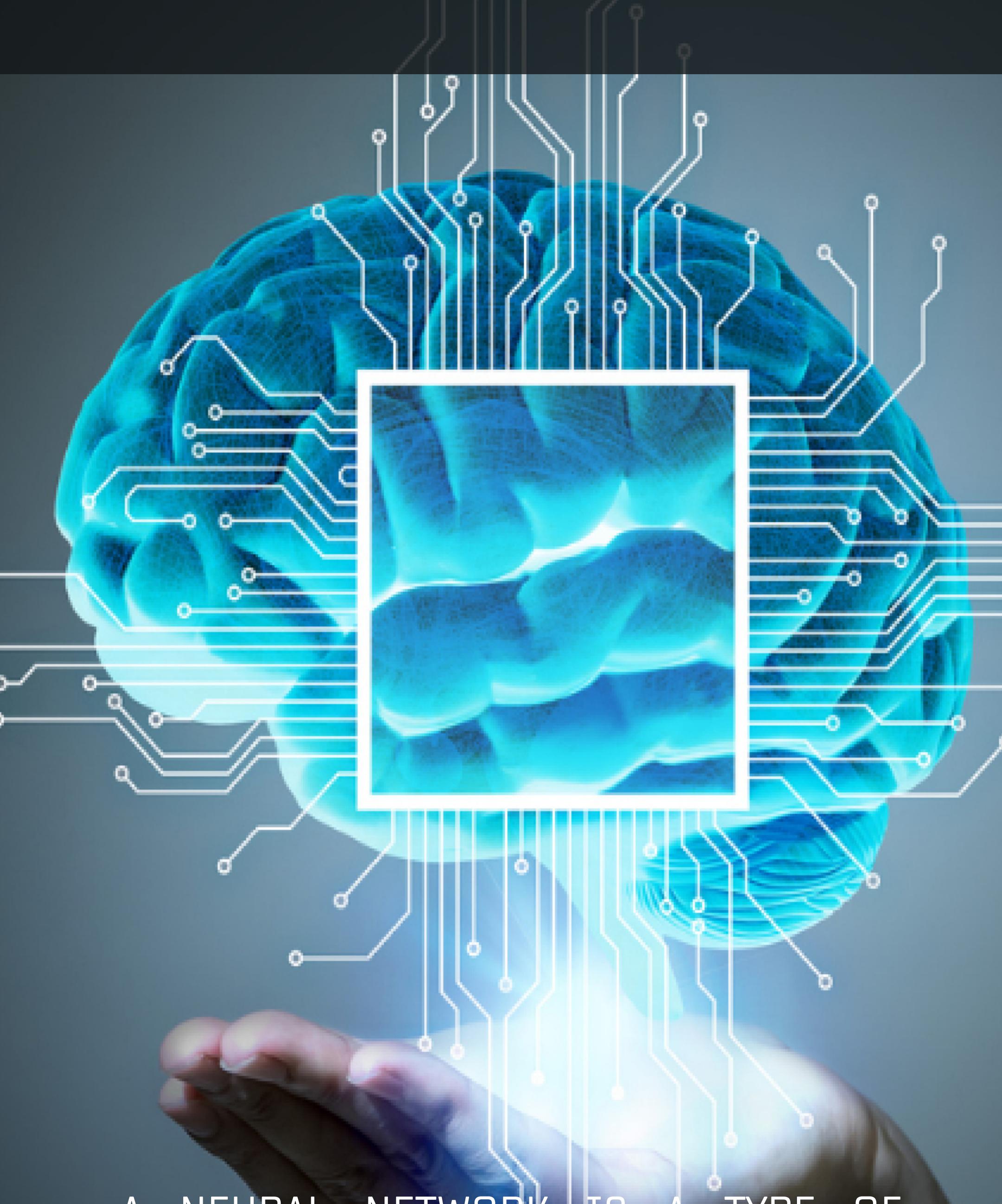
Then it sorts out the 5(or K) smallest distances and the label corresponding to them and then among these 5 it finds the mode which is the most recurring label in the set and gives it as an output

My model measures the euclidean distance from the points and then use argsort to find 5 smallest disatncest and then assign label corresponding to them and then

I made a function which finds the mode out of these 5 labels by counting the no of occurrances of each unique element in the list and then returning the one with the most counts

I used the data set provided by my mentors and my
ACCURACY was 83.52 %

NEURAL NETWORKS



A NEURAL NETWORK IS A TYPE OF MACHINE LEARNING ALGORITHM THAT IS INSPIRED BY THE STRUCTURE AND FUNCTION OF THE HUMAN BRAIN.

Neural networks are a type of machine learning model that are inspired by the structure and function of the human brain. They consist of interconnected nodes, called neurons, which process and transmit information.

There are several types of neural networks, but one of the most common is the feedforward neural network. In this type of network, information flows in one direction from the input layer to the output layer, with one or more hidden layers in between. Each neuron in the network receives input from the neurons in the previous layer, processes that input using an activation function, and passes the result on to the next layer.

Training a neural network involves adjusting the weights and biases of the neurons so that the network can make accurate predictions on new data. This is typically done using a technique called backpropagation, which involves propagating errors backwards through the network and adjusting the weights and biases based on those errors.

2 LAYER NN

Firstly, I made a 2 layer neural network in which I made 2 hidden layers.making a two layer was very easy as compared to making a generalised neural network

I used the data set provided by my mentors and my
ACCURACY was 86.5 %

N LAYER NEURAL NETWORK

After alot of effort and research I finally made the genralised neural network. First i spent time on genralising the formulas for back prop then i created a dictionary in which stored them for the layers given by the users.

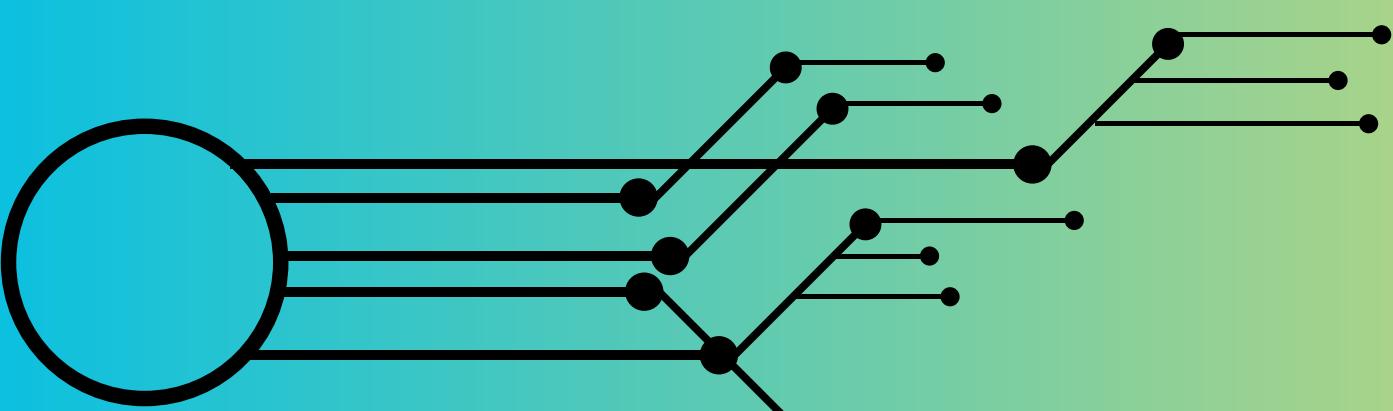
In this code I have not used keras lib to write any code i just used it to for just one line and that too to categorise my Y_train data so i sincerely hope that it can be forgiven.

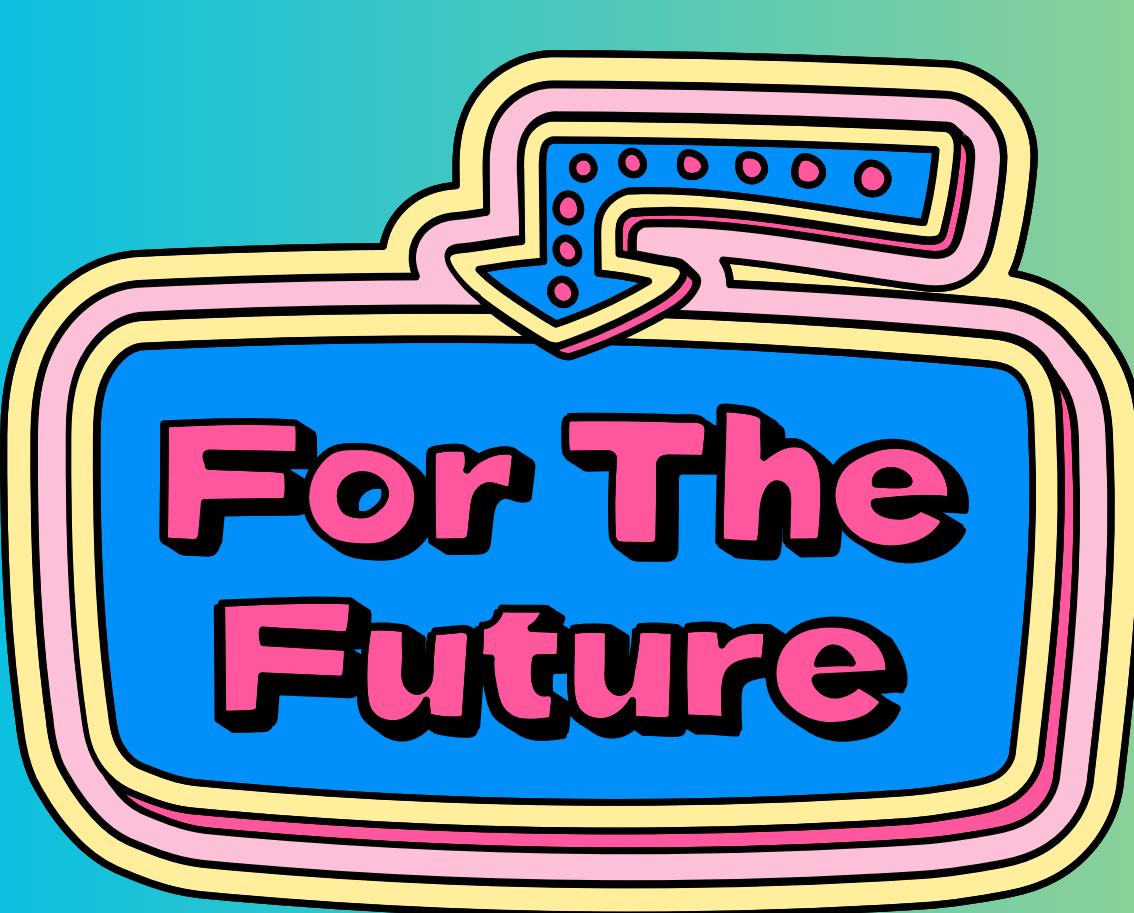
the model which i made in this the user can give input in the form of list which contains the no neurons of each layer and the no of layer will be created automatically by judging the no of inputs given

As the model work by taking the input from the user hence its accuracy is not fixed nd it depends on the input given by the user

LEARNING

Through this journey of 1 month I learnt the basics of machine learning . I learnt to code the basic code of regression and classification algorithms but I know that I am still only on the surface of machine learning . I learnt how to use numpy effectively I learnt to use vectorization to make my code faster I learnt about classification models such as KNN and neural network





For The Future

IN THE FUTURE I WANT TO
MAKE ANY PROJECTS
USING ML LIKE----

- my own voice search engine
- a model that helps me build a new highscore in a game
- and some medical based projects

Thank You

@reallygreatsite