

⇒ How ANN solve class problems

> you give an ~~about~~ of ex with correct answers.

prediction.

You ~~are~~ give the ANN something new to classify

⇒ Feature Engg and data set issues related to ANNs. (or EDA (Exploratory data analysis))

it is like getting your ingredients ready before you start cooking, you need to make sure your data is in the right form for the ANN to understand.

it's about picking the right pieces of information (features) from your data and transforming them into something useful.

Simpler future engg is about cleaning and preparing your data, and data set issues are about making sure your data is good enough for the ANN to learn from. it is like making sure you have good ingredients and a good recipe before you start cooking.

2 Stochastic GD: in this we select randomly ex I have selected row 2 of Data then I will find error and then update it.
then another like row 4.

3 MiniBatch: it is the comb of both 1 and 2. ex we have the data of 100 rows so we will make 20 rows from 100 as mini Batch. it means we will create 5 mini Batch. then I will select and Batch of 20 rows then I will find error then avg then update weight and Biases.

⇒ classification problems with ANNs:
it is like assorting things into categories

e.g.

> assorting email into spam or not spam

> looking at a picture and saying if its a cat or dog.

what are ANNs? simple they are like computer brains that learn from examples.

How they works.

> They have neurons (like brain cells) that process information.

> They learn & adjusting the connections b/w these neurons

> They get better at classifying things as they see more examples.

→ it is an optimization alg which is commonly used to train machine learning models, which enhance the performance of Neural Networks.

hui loss khej minimize karne mai help karne ke
alye:

⇒ Types of Gradient Descent:



- Batch Gradient D or (vanilla gradient Descent)
- Mini Batch Gradient Desent.
- Stochastic Gradient Desent

↳ Batch: example we have 5 rows of data, in predicted and actual columns we find loss of 1st row data
exam we find e_1 error of row 1
same for 2nd, 3rd, 4th and 5th e_2, e_3, e_4, e_5

Now we find average for all

$$\text{Avg } \frac{e_1 + e_2 + e_3 + e_4 + e_5}{5}$$

$$L = \frac{1}{2} (y - \hat{y})^2$$

then we will update.

↳ 1 it calculate each row error.

2 After finding errors individually we have to find Avg

3 then we have to update weight and biases.

4 it is specially for large data sets.

\Rightarrow Imagine you're a coffee shop owner, and you want to create the perfect coffee recipe, you have two ingredients: coffee beans and sugar.

You want to find the ideal amount of coffee beans and sugar to make the tastiest coffee. You can use Gradient Descent to help you.

1 Start with a random recipe (e.g. 10 coffee beans and 2 sugars)

2 Taste the coffee and calculate how good it is

3 Adjust the recipe slightly (e.g. add 1 coffee bean and subtract 1 sugar.)

4 Taste the new coffee and calculate how good it is.

5 Repeat steps 3-4 until you find the perfect recipe.

\Rightarrow Gradient Descent is like a guide that helps you find the best sol by making small adjustments and learning the results similar ex 5d numbers abg and take one step at a time. guess random the wavy to 30, then go the 40 the 50 slowly slowly move from there to the wavy actual and guess/predict value for which min error get "better min help handabg".

→ Gradient Descent On ANNs is the fundamental concept in AI Neural Networks.

Imagine you are hiking down a mountain to reach a lake. The mountain represents a mathematical function, and lake represent the optimal solution.

→ Gradient Descent is an Alg that helps you navigate down the mountain.

1. Starting at random point on the mountain.

2. Looking around to see which direction is downhill (negative gradient)

3. Taking a small step in that direction.

4. Repeating step 2-3 until you reach the lake.

→ How does it work in ANNs:

In ANNs, Gradient Descent is used to optimize the weights and biases of the network to minimize the error b/w predicted and actual outputs.