**Two Spirals data**

**Project Overview:**

* We should create the deep learning models for the Two Spirals data. The Two Spirals data set consist of the three features two features are input and one feature is target.

**Data pre-processing:**

* Data Cleaning steps have been performed

1. Checking the duplicates
2. Checking Null values
3. Checking outliers in the data.

**Model Architecture:**

* Splitting the data into input variables and output variables and rescaling the data before building the model.
* Model has total four layers 1 input layer, 2 hidden layers and 1 output layer.
* I have used these activation functions like Sigmoid, tanh and relu for creating the different models for the Two Spirals data.

**Evaluation Metrics:**

* I have used **SGD** and **Adam optimization algorithm** used during the training process to optimize the equation, including the number of epochs used are 50, batch size is 10, and validation split is 0.2.
* Evaluation Metrics used for these data is **Accuracy** used to assess the performance of your models on the Ushape dataset and loss function is **Binary cross entropy**.

**Results and Conclusions:**

* Firstly, I have created the model using the **sigmoid** activation function then loss is **Binary cross entropy**. Calculated the loss and plotted the loss using matplotlib and identifying the model is prone to overfit or underfit.
* **Sigmoid** is giving the accuracy of **0.475** for the Two Spirals data
* Secondly, I have created the model using the **tanh** activation function then loss is **Binary cross entropy**. Calculated the loss and plotted the loss using matplotlib and identifying the model is prone to overfit or underfit.
* **Tanh** is giving the accuracy of **0.715** for the Two Spirals data.
* I have created another model using the **Relu and Tanh** activation function then loss is **Binary cross entropy**. Calculated the loss and plotted the loss using matplotlib and identifying the model is prone to overfit or underfit.
* **Relu and Tanh** is giving the accuracy of **0.795** for the Two Spirals data.
* I have created another model using the **Relu** activation function then loss is **Binary cross entropy**. Calculated the loss and plotted the loss using matplotlib and identifying the model is prone to overfit or underfit.
* **Relu** is giving the accuracy of **0.475** for the Two Spirals data.
* I have created another model using the **Relu and sigmoid** activation function then loss is **Binary cross entropy**. Calculated the loss and plotted the loss using matplotlib and identifying the model is prone to overfit or underfit.
* **Relu and sigmoid** is giving the accuracy of **0.83** for the Two Spirals data.