ARTIFICIAL NEURAL NETWORK

SIMULATION REPORT

ABSTRACT

ANN is a computational model inspired by the structure and function of the human brain. It's a type of machine learning algorithm that uses interconnected nodes, or artificial neurons, organized in layers, to process and learn from data.

Earl Gem Llesis

BSCS 3-5

I. Problem Formulation (Discuss the objectives of the activities)

Objective:

1. Create an ANN architecture with its layers and observe how it works.
2. Apply the different type of activation function (sigmoid, tansig, etc.) for the model
3. Try to simulate the model by having all weights set to 0.5 and biases set to 0.1

Materials

a. Excel

B. Personal Computer

II. Planning

a. Members Role and Responsibility

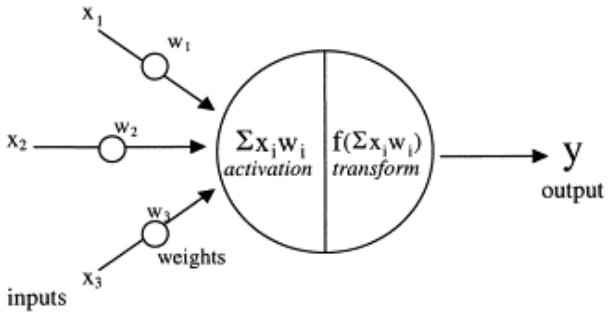
Member	Designer	Coder (function maker)	Presenter
Abuela, Charles Andrei	X		
Alano, Ruzel Luigi			X
Bajit, Giancarlo			X
Francisco, Meinard Adrian		X	
Hinay, Anthony John		X	
Llesis, Earl Gem	X		
Maisog, Rodney James	X		
Sta Ines, Jhonder	X		

b. Project Schedule

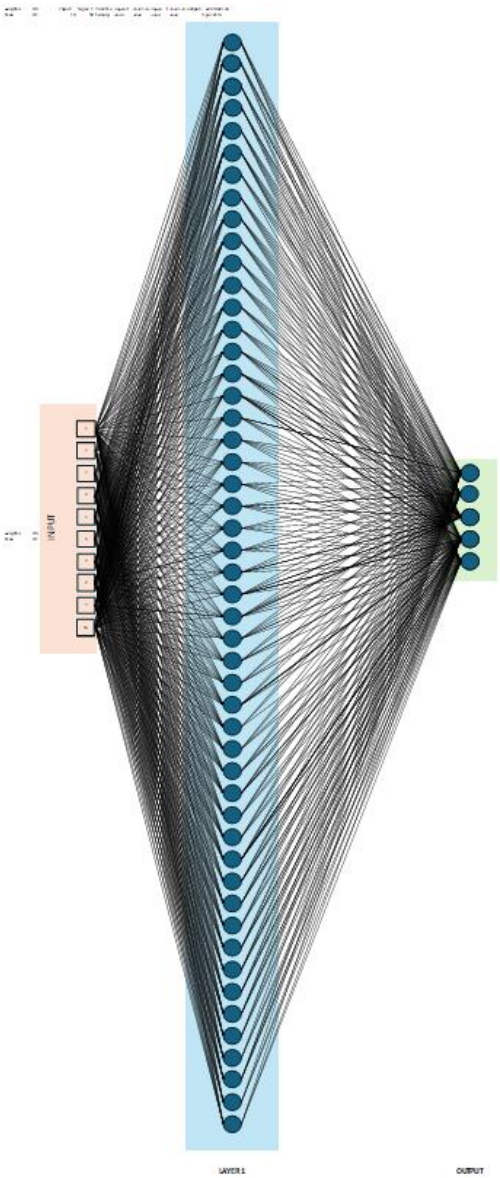
Project Activities	Start Date	End Date
Create the ANN architecture	June 15, 2025	June 16, 2025
Implement the functions (tansig) for the activation function and all the needed functions for the model	June 16, 2025	June 17, 2025
Presenting and explaining the ANN architecture to our fellow classmates.	June 21, 2025	June 21, 2025

III. Model Concepts

a. Conceptual Model



b. Actual Model



Requirements: 10 Input, 50 neuron for the hidden layer (Tansig), 5 outputs (Purelin)

VI. Analysis

a. Discussion of the Result

In this activity, we created an artificial neural network (ANN) with 10 input nodes, one hidden layer containing 50 neurons using the Tansig activation function, and an output layer with 5 neurons using the Purelin activation function. We manually put the connection in an excel file to see how many connections is needed for the model. Turns out it for this simple model, it needs a total of 2500 connections which is very time consuming to do. We successfully created the model despite the many merge conflict that emerges in the creation of the architecture.

b. Conclusion and Takeaways

My key takeaway from this activity is mostly an appreciation for the intricate beauty of neural architectures. Constructing an ANN with just 10 inputs, 50 hidden neurons, and 5 outputs revealed a staggering 2,500 weighted connections where each one has a significant influence in the shaping of prediction. It's quite great to witness how this complicated web of interactions transforms simple inputs into meaningful outputs.

The sheer density of connections, a whooping of 2,500 connections woven between layers which mirrors the astonishing complexity of biological systems. Yet here, in this artificial microcosm, I found some kind of magic: the elegance of forward propagation breathing life into numbers, and the precision of backpropagation tuning each connection.

This experience didn't just teach me about neural networks; it revealed the quiet artistry in their architecture. Behind every prediction lies a tapestry of thousands of relationships which is a testament to how simplicity, scaled into complexity, creates intelligence.