**Week 1-2 (Oct 8th - Oct 22nd): Research and Find Data**

**1.1 Research What Others Have Done (Literature Review)**

* **Goal:** Learn what other researchers or companies have done with neural networks for managing customer memberships and loyalty programs. This will help you understand the field and identify gaps where your project can contribute something new.
* **What to do:**
  1. **Search for Articles and Papers:**
     + Go to online databases like **Google Scholar**, **IEEE Xplore**, and **ACM Digital Library** to find academic papers on topics like neural networks, customer loyalty programs, and data integration.
     + Use simple search terms like “neural networks for customer data,” “loyalty program management,” or “membership systems with AI.”
  2. **Read and Summarize the Papers:**
     + For each paper, write down the main ideas. Focus on how they use neural networks to solve problems related to managing customer data, improving loyalty programs, or integrating membership systems.
     + Take notes on what methods they used, what problems they solved, and what they didn’t cover. This will help you see where your project can be different or better.
  3. **Write a Literature Review:**
     + Start writing a summary of what you learned from the papers. Explain how neural networks are used in customer data management and loyalty programs.
     + Your goal is to write **5-7 pages**. Include sections like:
       - **Introduction:** What is the general problem (managing customer memberships) and how neural networks could help.
       - **Related Work:** Describe the papers you found. What approaches have others used? What results did they achieve?
       - **Gaps and Opportunities:** Point out where these papers left room for improvement or areas they didn’t cover. This is where your project can add value.

**1.2 Decide What Data You Need**

* **Goal:** Figure out what kind of data your neural network will need to work properly. This will help you create a unified membership system for customers.
* **What to do:**
  1. **Identify the Data Types:**
     + Think about the kinds of data your neural network needs. For a membership system, you might need:
       - **Customer Information:** Basic details like customer ID, gender, age (anonymized to protect privacy).
       - **Transaction Data:** Details about purchases, such as what items were bought, when they were bought, and how much was spent.
       - **Membership Activity:** Data about how customers use their memberships, such as loyalty points, rewards claimed, and visits to the store.
  2. **Decide How to Get the Data:**
     + **Real Data:** Consider asking businesses for anonymized membership and transaction data. You can reach out to local companies or larger businesses with loyalty programs.
     + **Synthetic Data:** If you can’t get real data, you can create fake (synthetic) data. This means generating sample data that mimics real-world scenarios, such as customer behavior and transactions, but without using actual people’s data.
  3. **Check Data Privacy Rules:**
     + Make sure you understand data privacy rules, like **GDPR** (General Data Protection Regulation) in Europe, or **CCPA** (California Consumer Privacy Act) in the U.S. These rules make sure that customer data is protected. If you’re working with real data, it must be anonymized, meaning it should not include names or personal details that can identify a person.