**Introduction:**

Temporal memory algorithms have been widely used in machine learning for modeling temporal sequences. These algorithms are inspired by the principles of the cortical column and the neocortex, which are responsible for processing sensory information and storing long-term memories in the brain. The Temporal Memory algorithm is a well-known implementation of these principles, which has been used in various applications such as natural language processing, anomaly detection, and stock price prediction.

However, accurately evaluating the performance of the Temporal Memory algorithm can be challenging, especially when dealing with complex and noisy data. Therefore, improving the unit test for this algorithm is crucial for ensuring its accuracy and reliability. In our software engineering project, we propose several improvements to the existing unit test for the Temporal Memory algorithm. These improvements include the creation, removal, and update of synapses in distal segments, growth of new dendrite segments, activation of cells in columns, and detection/handling of duplicate active columns.

Overall, our software engineering project aims to enhance the reliability and accuracy of the unit test for the Temporal Memory algorithm, enabling more accurate evaluation of its performance. This improvement can help advance the development of more robust and reliable algorithms for modeling temporal sequences, benefiting various domains and applications.

**Software Engineering Project details:**

If you need to obtain a copy of our project on your own system, use these links in order to carry out development and testing. Look at the notes on how to deploy the project and experiment it out on a live system. These are the relevant links:

Project Solution File

Project Documentation

Final Project

Unit Test Cases

**What is our experiment about:**

**Project Description:**

Temporal memory algorithms have gained popularity as a promising approach for modeling temporal sequences in machine learning. This project aims to improve the unit test for the given temporal memory algorithm, which is based on the principles of the cortical column and the neocortex. The algorithm uses a sparse distributed representation of data and incorporates temporal context to predict future values in a sequence. We implemented improvements to the existing unit test, including the addition of more test cases with varying complexity and the implementation of cross-validation techniques for better evaluation of the algorithm's performance. We also optimized the implementation of the algorithm for improved efficiency and scalability.

**Project Objectives:**

our software engineering project aims to enhance the reliability and accuracy of the unit test for the Temporal Memory algorithm, enabling more accurate evaluation of its performance. This improvement can help advance the development of more robust and reliable algorithms for modeling temporal sequences, benefiting various domains and applications.

**Information’s about the Azure accounts and its components**

|  |  |  |
| --- | --- | --- |
| **Resource Group** |  |  |
| **Container Registry** |  |  |
| **Container Registry server** |  |  |
| **Container Instance** |  |  |
| **Storage account** |  |  |
| **Queue storage** |  |  |
| **Blob container** |  |  |
| **Table storage** |  |  |

**How to run experiment:**

**Step1 : Message input from azure portal**

**A screenshot of a computer

Description automatically generated**

**Messages added to queue :**

**A screenshot of a computer

Description automatically generated**

**Queue Message that will trigger the experiment:**

**A screenshot of a computer

Description automatically generated**

**Step2: Pulling docker image from azure container registry**

**Step3: Describe the Experiment Result Output Container**

**Step4: Experiment Result**