Diary Entry - Week 12

Date: 30-09-2024 to 04-10-2024

Summary:

Week 12 encompassed an exploration into advanced machine learning and deep learning concepts, including community detection, spectral clustering, recursion, recurrent neural networks (RNNs), and natural language processing (NLP).

Community Detection and Spectral Clustering:

- Dived into community detection algorithms, understanding their role in identifying densely connected groups in complex networks.
- Explored spectral clustering as a technique for partitioning graphs into clusters based on the eigenvalues of the similarity matrix, gaining insights into its applications and limitations.

Recursion:

- Engaged in a discussion on recursion, a fundamental concept in computer science and mathematics, exploring its principles and applications in algorithm design.
- Delved into recursive algorithms, understanding their structure, termination conditions, and efficiency in solving problems with repetitive substructures.

Recurrent Neural Networks (RNNs) and NLP:

- Continued the exploration into recurrent neural networks (RNNs), focusing on their applications in natural language processing (NLP) tasks such as text generation, sentiment analysis, and language translation.
- Explored the architecture of RNNs tailored for sequential data processing, understanding the challenges and techniques for training and optimizing RNN models.

Coding Challenge - Week 8:

- Participated in the coding challenge centered around community detection and spectral clustering algorithms.
- Applied theoretical knowledge to practical coding exercises, implementing community detection algorithms and spectral clustering techniques on sample datasets.