**TITLE:- Text Classification Project: Amazon Reviews**

**Overview**

This project involves the implementation of deep neural networks for text classification using Amazon reviews. The main focus is on two architectures: Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM) with attention mechanisms. The goal is to classify reviews into different categories.

**Project Steps**

**1. Data Collection**

* Gathered Amazon reviews from various internet sources to create a diverse dataset for training and testing.

**2. Text Pre-processing**

* Removed stop words, performed stemming/lemmatization, and other necessary text pre-processing steps to clean and prepare the data for model training.

**3. Data Split**

* Split the dataset into training and testing sets with an 80-20 ratio, respectively.

**4. Word Embeddings**

* Utilized Word2Vec to represent words as numerical vectors, capturing semantic relationships between words.

**5. Model Training**

**5.1 CNN**

* Designed and implemented a Convolutional Neural Network architecture for text classification.

**5.2 LSTM + Attention**

* Created a Long Short-Term Memory network with attention mechanisms to capture sequential dependencies in the text data.

**6. Model Validation**

* Evaluated the trained models on the test data to assess their performance in classifying Amazon reviews.

**7. Fine-Tuning**

* Iteratively fine-tuned model parameters to enhance classification accuracies on both training and test datasets.

**How to Use**

1. **Dependencies**: Ensure that the required libraries and dependencies are installed.
2. **Data Preparation**: Prepare your own dataset or use the provided Amazon reviews dataset.
3. **Pre-processing**: Run the pre-processing script to clean and preprocess the text data.
4. **Word Embeddings**: Choose Word2Vec for word embeddings by modifying the configuration in the script.
5. **Model Training**: Run the training script for CNN and LSTM + Attention networks.
6. **Model Evaluation**: Evaluate the trained models on the test dataset.
7. **Fine-Tuning**: Adjust model parameters in the scripts to fine-tune the models for improved performance.

**Results**

Provide an overview of the classification accuracies, loss curves, and any other relevant metrics obtained during the training and evaluation phases.