Week 3 Assignment-AI Tools Application Assignment

Q1: Explain the primary differences between TensorFlow and PyTorch. When would you choose one over the other?

Tensorflow is static and more complex syntax (though improved with Keras) devices while pytorch is known for its dynamic computation graph and more intuitive. I prefer Tensorflow because it provides bbetter support for scalable deployment, mobile, and edge devices.

Q2: Describe two use cases for Jupyter Notebooks in AI development.

1. Used to rapidly build, train, and evaluate machine learning or deep learning models using tools like matplotlib or TensorBoard.

2.Used to prepare data before training deep learning models ; jupyter notebook let you load data, visualize distributions, and try different preprocessing techniques in real time.

Q3: How does spaCy enhance NLP tasks compared to basic Python string operations?

Spacy understands language structure: it tokenizes text into words, identifies parts of speech (POS), lemmas, named entities, syntactic dependencies, and more unlike basic python string which use .replace( ),.split ( ).

1. Short Answer Questions

2. Comparative Analysis

- **Compare Scikit-learn and TensorFlow in terms of:**

Target applications (e.g., classical ML vs. deep learning).

Scikit-learn is a classical machine learning while tensorflow is a deep learning and neural networks.
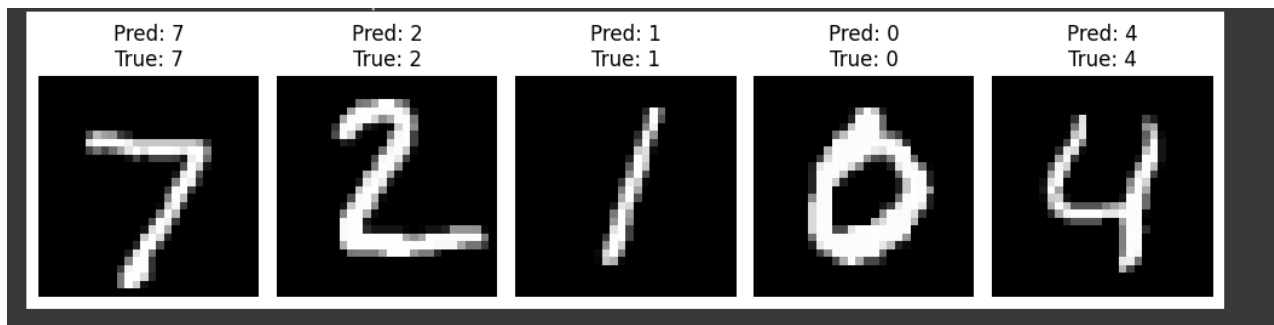
Ease of use for beginners.

Scikit-learn is simple and consistent while tensorflow is more complex especially for modern customization.

Community support.

Scikit-learn is widely used in education and industry for classical ML while tensorflow has huge community, especially in AI/ML research and production

Accuracy Graph

Pred: 7	Pred: 2	Pred: 1	Pred: 0	Pred: 4
True: 7	True: 2	True: 1	True: 0	True: 4

NER results

```
Review: I absolutely love my new Apple iPhone 13. It works like a charm!
→ Entities Found: ['iPhone 13', 'Apple']
→ Sentiment: positive (Score: 0.335)

Review: The Samsung Galaxy S21 is terrible. It crashed within a week.
→ Entities Found: ['Galaxy S21', 'Samsung']
→ Sentiment: negative (Score: -1.0)

Review: Sony headphones are amazing! Great sound quality.
→ Entities Found: ['headphones', 'Sony']
→ Sentiment: positive (Score: 0.65)

Review: The Dell laptop feels cheap and slow. Not worth the price.
→ Entities Found: ['laptop', 'Dell']
→ Sentiment: negative (Score: -0.017)

Review: I got the new Fitbit Versa 3 and I'm very impressed with the features.
→ Entities Found: ['Versa 3', 'Fitbit']
→ Sentiment: positive (Score: 0.568)
```