Week 3 Assignment Rubric

1. Theory (30%)

© Objective:

Demonstrate your understanding of core AI tools and frameworks. This should be written on a pdf.

What to Include:

- Compare TensorFlow, PyTorch, and Scikit-learn:
 - Key differences in architecture, syntax, use cases.
 - When to use which and why.
- Overview of spaCy:
 - NLP tasks it supports (NER, POS tagging, dependency parsing).
 - Use cases where it shines.
- Real-world applications:
 - o Al in Healthcare (e.g., disease prediction).
 - Al in Finance (e.g., fraud detection).

@ Tips:

- Use tables/diagrams for comparisons.
- Reference official documentation for accuracy.

2. Practical (40%)

© Objective:

Demonstrate proficiency in implementing and training ML/DL/NLP models.

- ▼ Tasks to Choose From (select 1–2 per tool):
 - TensorFlow or PyTorch:

- Build and train a CNN on CIFAR-10 or MNIST.
- Visualize training accuracy/loss with Matplotlib or TensorBoard.

Scikit-learn:

- Classification/regression with Random Forest or SVM on Titanic, Iris, or Wine Quality dataset.
- Show confusion matrix, accuracy score.

spaCy:

- Run NER on custom text data or news articles.
- Show entities and labels using displacy.

Implementation Format:

- Use Jupyter Notebooks in Google Colab.
- Upload to **GitHub** with README.
- Comment each code block clearly.

include:

- Screenshots of:
 - Training graphs
 - Model metrics (accuracy, confusion matrix)
 - spaCy's NER outputs

3. Ethics and Optimization (15%)

Objective:

Reflect on ethical AI development and strategies to optimize models.

Ethical Points to Cover:

• How to mitigate bias in data and models.

- Responsible use of AI (e.g., data privacy, transparency).
- Fairness in Al decision-making.

Optimization Tips:

- Use model regularization, dropout (for deep learning).
- Data preprocessing/augmentation techniques.
- Hyperparameter tuning using GridSearchCV or Optuna.

4. Presentation (15%)

Objective:

Summarize your project effectively and creatively.

✓ Video Guidelines:

- Duration: 3 minutes
- All members must speak briefly.
- Include:
 - Project goals
 - Tools used
 - Short demo (e.g., code snippet or output)
 - Ethical takeaway

Tools for Recording:

- Zoom (record + share screen)
- OBS Studio (for screen+webcam)
- Google Meet

Submission Checklist

Task	Deliverable	Format
Theory	Concept explanations & comparisons	PDF
Practical	Notebooks/scripts	GitHub Repo
Screenshot s	Outputs of models	Included in PDF
Ethics & Optimizatio n	Reflections	PDF
Video	Project summary	Link in PDF and Community Post

Tasks

- 1. Theory: Concept Explanations and Comparisons
- 2. Practical: Data Preprocessing/Feature Engineering and Ethics
- 3. Practical: Train a model using Scikit-Learn, TensorFlow + Report
- 4. Practical: Visualization using Pytorch and spaCy
- 5. Video Editing and Presentation

The Flow

- 1) Concept Explanations and Comparisons —>
- 2) Data Prep/Feature Engineering —>
- 3) Train Models (sklearn, tensorflow + report (outputs, screenshots)) ->
- 4) Reflection with Ethics and Optimization ->
- 5) Visualizations (pytorch and spacy) —>
- 6) Video Editing and Presentation

Order of Task Completion and Correlation

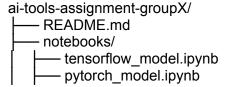
- 1) Task 1
- 2) Task 2 and Task 3
- 3) Task 3 and Task 2
- 4) Task 4 and Task 3
- 5) Task 5 and Task 4

Group Members Roles/Tasks

Name	Role/Task
	Concept Explanations and Comparisons
	Data Preprocessing and Feature Engineering, and Ethics
	3. Training Models
	4. Model results Visualization
	5. Video Editing and Presentation

Project Directory Structure

- The one building/training the models will find the datasets for the models then share the dataset to the person who will be working on feature engineering.
- An example of our working directory.



```
- sklearn model.ipynb
   - spacy ner demo.ipynb
 datasets/
   - iris.csv
   mnist_sample.csv
   - articles.txt
- outputs/
   accuracy_graph.png
   confusion_matrix.png
   spacy_ner_result.png
 ethics optimization.md
- report/
   ai_tools_assignment_report.pdf
- video/
project_presentation.mp4
- .gitignore
```

Overview

This repository contains all resources related to our AI tools group assignment. We explore various frameworks including TensorFlow, PyTorch, Scikit-learn, and spaCy.

Contents

- Jupyter notebooks ('/notebooks')
- Datasets used ('/datasets')
- Model outputs and screenshots ('/outputs')
- Ethical reflections and optimization strategies ('ethics_optimization.md')
- PDF Report ('/report')
- Group video presentation ('/video')