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Mastering the AI Toolkit — AI Tools and Applications

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1. Theoretical Understanding

- AI Tools & Frameworks:** Tools like Scikit-learn, TensorFlow, PyTorch, and spaCy enable developers to create models for prediction, classification, image recognition, and text understanding.
- Real-world Use Cases:** TensorFlow and PyTorch are used in medical image diagnostics, Scikit-learn in data prediction, and spaCy in language understanding like chatbots.

2. Practical Implementation

Notebook	Tool	Dataset	Accuracy/Result
01_classification_skl earn	Scikit-learn	Iris dataset	97% accuracy
02_cnn_tensorflow	TensorFlow/Keras	Fashion MNIST	88% accuracy
03_transfer_pytorch	PyTorch	CIFAR-10 (transfer learning)	91% accuracy
04_spacy_ner	spaCy	Custom text	Detected “Ibuprofen” as MEDICATION

3. Ethical Reflection

AI must be developed responsibly to avoid bias and harm.
In this project, only open datasets were used. No personal data was collected. Models

were trained transparently with attention to fairness, reproducibility, and educational purpose.

4. Optimization

Optimization methods included pipeline scaling (Scikit-learn), CNN tuning (TensorFlow), and transfer learning (PyTorch). These reduced computation time while maintaining accuracy.

5. Conclusion

This assignment demonstrated how various AI frameworks complement each other. Each one—from Scikit-learn to spaCy—addresses different problem types, together forming a complete AI development toolkit.