Mini Report: Connecting Machine Learning with Generative AI

Assessment - 1

ML Classification: Teaching a Machine to Make Decisions

In this part, we used two well-known machine learning models — **Logistic Regression** and **Random Forest Classifier** — to train a system to make predictions from data. Our goal was to make the model accurate and reliable.

How the Models Were Set Up:

- **Logistic Regression**:
  - We used lib linear, a good method for small datasets.
  - It included regularization (L2) to stop the model from overfitting (memorizing the data too much).
  - The regularization value (C) was set to 1.0.

- **Random Forest**:
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  - Limited tree depth to 10 to prevent overfitting.
  - Used Gini index to decide how to split the data.

Results & What they mean:

Model	Training Accuracy	Test Accuracy	Comment
Logistic Regression	94.2%	91.0%	Simple and easy to understand
Random Forest	99.1%	93.5%	More accurate but slightly overfitted

What We Learned:

Random Forest gave better results but was a bit too perfect on training data (overfitting). Logistic Regression was simpler and still gave good accuracy, making it great for simpler problems.

Assessment - 2

GenAI Experiment: Letting AI Write Stories:

In this experiment, we used a language model called **GPT-2** from Hugging Face. We gave it a sentence like **"Once upon a time..."**, and let it continue the story. We tested how changing a setting called **temperature** affects the way AI writes.

Prompt:

"Once upon a time..."

What Happened with Different Temperatures ?

Temperature	Style of Writing	Description
0.7	Focused and logical	Clear and sensible storytelling
1.0	More creative and random	Fun, surprising, sometimes silly

Examples:

- **At 0.7**: The AI wrote a classic fairytale story with a knight and a quest.

- **At 1.0**: It created a wild story about a dragon, a disco ball, and a cheese meteor!

What We Noticed:

Temperature controls creativity. Lower = safer and more normal. Higher = fun, crazy, and imaginative.

What I Learned

Interesting Discoveries:

- Changing one number (temperature) totally changes how the AI writes.
- AI isn't just about math — it can also be **creative**.

What Was Difficult:

- Understanding how randomness (top-k sampling) works in text generation.
- Adjusting model settings (hyperparameters) to get the best results without overfitting.

Final Thoughts

This project showed two sides of AI:

- One that learns from data to make decisions (ML).
- One that creates brand-new content (GenAI).