Assignment 1: Hugging Face Model Exploration

Objective

The objective of this assignment is to explore an open-source language model (LLM) from the Hugging Face Hub, install it locally, and perform a simple NLP task to understand how transformers can be applied in real-world scenarios.

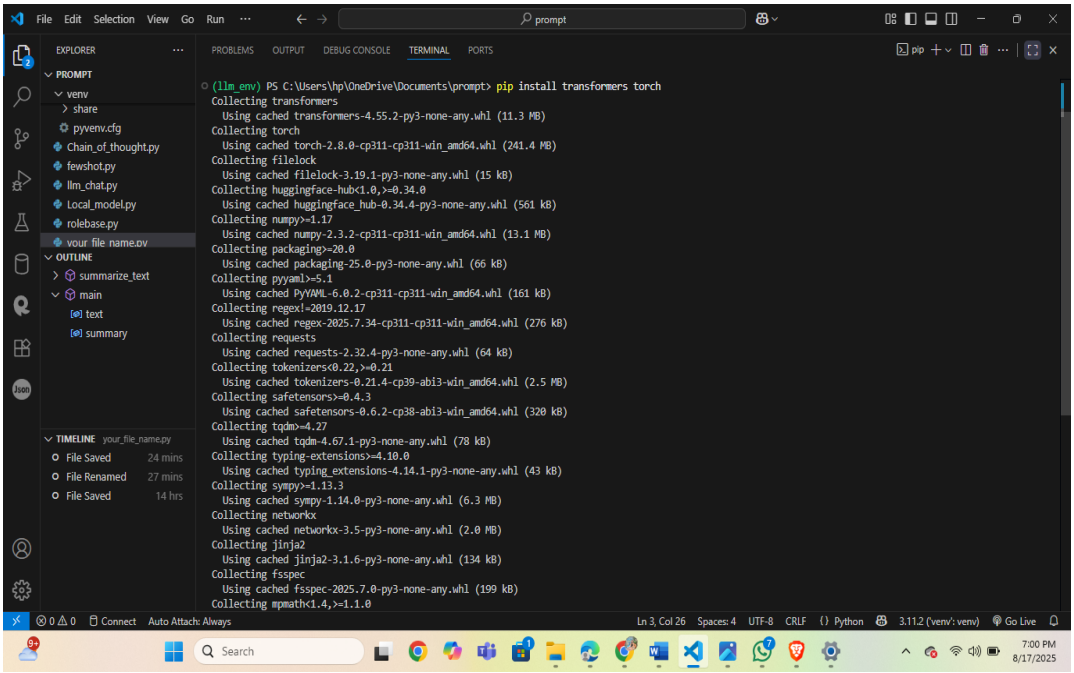
Steps

1. Environment Setup
Create a new virtual environment
python -m venv llm_env

Activate the environment (Windows)
llm_env\Scripts\activate

Activate the environment (Linux/Mac)
source llm_env/bin/activate

Install Hugging Face Transformers and Torch
pip install transformers torch



2. Model Selection

For this task, the chosen model is facebook/bart-large-cnn, a transformer-based model widely used for text summarization tasks.

3. Model Loading in Python
from transformers import pipeline

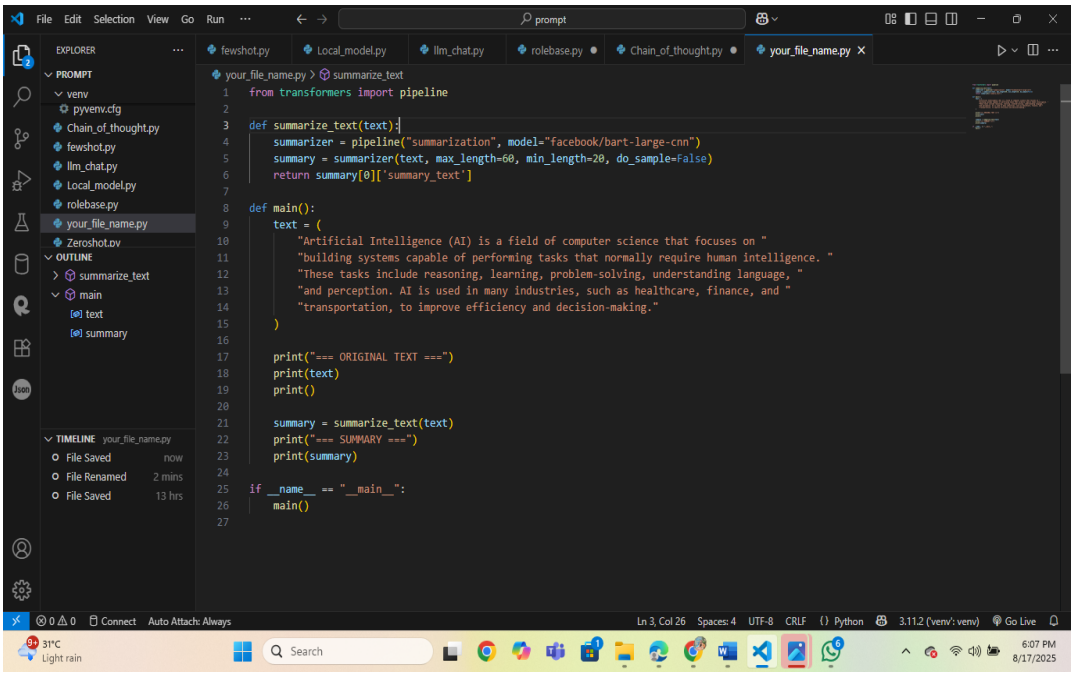
def summarize_text(text):
summarizer = pipeline("summarization", model="facebook/bart-large-cnn")
summary = summarizer(text, max_length=60, min_length=20, do_sample=False)
return summary[0]['summary_text']

def main():
text = (
"Artificial Intelligence (AI) is a field of computer science that focuses on "
"building systems capable of performing tasks that normally require human intelligence. "
"These tasks include reasoning, learning, problem-solving, understanding language, "
"and perception. AI is used in many industries, such as healthcare, finance, and "
"transportation, to improve efficiency and decision-making."
)

print("=== ORIGINAL TEXT ===")
print(text)
print()

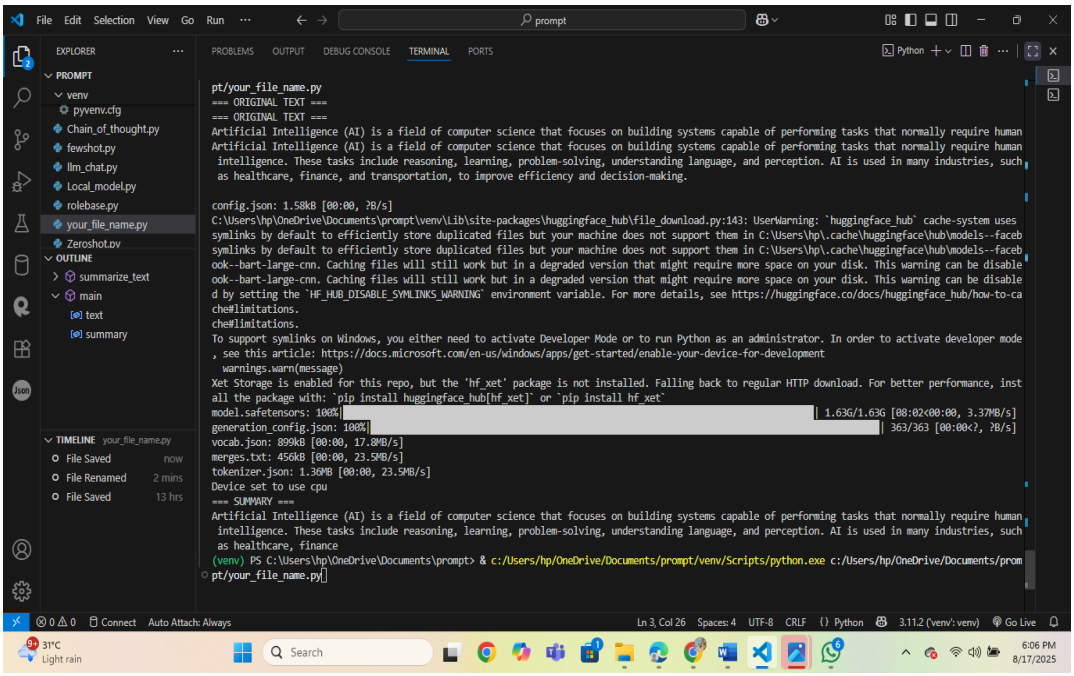
summary = summarize_text(text)
print("=== SUMMARY ===")
print(summary)

if __name__ == "__main__":
main()



4. Sample Output
=== ORIGINAL TEXT ===
Artificial Intelligence (AI) is a field of computer science that focuses on building systems capable of performing tasks that normally require human intelligence. These tasks include reasoning, learning, problem-solving, understanding language, and perception. AI is used in many industries, such as healthcare, finance, and transportation, to improve efficiency and decision-making.

=== SUMMARY ===
AI is a branch of computer science focused on creating systems that perform tasks requiring human intelligence. It is applied across industries like healthcare, finance, and transportation to enhance efficiency and decision-making.



Reflection

This exercise demonstrated how to set up a Python environment, install machine learning libraries, and use an open-source model from Hugging Face. By working with BART, we performed text summarization, gaining insights into how transformer-based models condense natural language while preserving key meaning. This hands-on approach builds the foundation for working with larger LLMs in local or cloud environments.

Deliverables Completed:

- Environment setup commands
- Model loading code
- Sample output with explanation

- Report format with placeholders replaced by images