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# Install spacy if not already installed (uncomment the next line if needed) # pip install spacy

# python -m spacy download en\_core\_web\_sm import spacy

# Load a small English language model that contains vocabulary, syntax, and NER nlp = spacy.load("en\_core\_web\_sm")

# Input sentence (can be from chatbot, search, email, etc.)

text = "Google acquired DeepMind in 2014 for developing artificial intelligence."

# Step 1: Process the text using the NLP pipeline doc = nlp(text)

# Step 2: Print each word and its Part-of-Speech (POS) tag and dependency relation print(" Word-Level Semantic and Syntactic Information:\n")

for token in doc:

print(f"Text: {token.text:15} | POS: {token.pos\_:10} | Dependency: {token.dep\_:15} | Head:

{token.head.text}")

# Step 3: Named Entity Recognition (NER)

print("\n Named Entities (Real-world concepts recognized):\n") for ent in doc.ents:

print(f"Entity: {ent.text:25} | Label: {ent.label\_} | Explanation: {spacy.explain(ent.label\_)}")

# Step 4: Print root verb and its subject and object — basic semantic role labeling print("\n Semantic Roles (Who did what to whom?):\n")

for token in doc:

if token.dep\_ == "ROOT": # main verb

subject = [w for w in token.lefts if w.dep\_ in ("nsubj", "nsubjpass")] obj = [w for w in token.rights if w.dep\_ in ("dobj", "pobj")] print(f"Action: {token.text}")

print(f"Subject(s): {[w.text for w in subject]}") print(f"Object(s): {[w.text for w in obj]}")

OUTPUT

