CSSE 315 – Natural Language Processing
Rose-Hulman Institute of Technology

Worksheet 11

Name (Print):_____ Date:_____

1. NLP Knowledge Survey. Please rate your knowledge on the following topics before and after taking this course using a scale from 0 (No Knowledge) to 5 (High Level = comfortable applying skills to your own data):

Topic	**Before Class (0-5)**	**After Class (0-5)**
Language Processing		
Speech and Speech Recognition		
Large Language Models (LLMs)		
NLP Applications		
Using Google Colab		
Using LLM APIs		
Prompt Engineering		
Logic-based Prompting (ReAct, CoT, ToT)		
LLM Optimization Techniques		
AI Agents		
Gemini Models		
Hugging Face		
NLP Biases		
Tokenization Types		
Feature Engineering		
Embeddings		
Regular Expressions in NLP		
Transformer Architecture		
Vector Databases		
Fine-tuning LLMs		

Table 1: Knowledge Survey Before and After Class

2. Go to Google Translate and translate the Turkish sentence ”O bir doctor” into English. What do you observe?

3. What does WEAT stand for?

4. WEAT measures the degree of bias and identify _____ between word embeddings and target concepts

5. Name two popular word embeddings models

    1.
    2.

6. Recall the cosine similarity formula

7. Use WEAT Colab practice and create your own target and attribute sets. List your sets and scores. Provide your observation:

    1. Target set 1:
    2. Target set 2:
    3. Attribute set:
    4. Scores:

    Reflection:

8. Debiasing techniques aim to mitigate biases while _____ the useful semantic structure of embeddings

9. True/False Hard Debiasing technique removes gender-related information from the embeddings after training

    (a) True
    (b) False

10. Name 2 limitations for Hard Debiasing

    1.
    2.

11. What does CDA stand for?

12. CDA technique _____ the training corpus with counterfactual examples that counter stereotypes, so the model learns a more balanced representation

13. Name 2 limitations of CDA

    1.
    2.