CSE 4392/5369 Special Topic: Natural Language Processing

Homework 1 - Spring 2026

Due Date: Jan 19, 2026, 11:59 PM

Problem 1 - 50%

Please read the following carefully and put your name and ID number in all the places indicated to acknowledge that you have understood it.

Honor Code Acknowledgement:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

As a student enrolled in CSE 4392/5369, I will adhere to the UT Arlington Honor Code given above.

Name:
Student ID:

Assignment Policy Acknowledgement:

There will be several homework assignments in this course. Most of the tasks will require handwritten or typed solutions. Some assignments may have programming tasks. The solution to programming tasks can be programmed in base versions of specific programming language which will be specify in homeworks. ***All homework submissions must be submitted via Canvas. No other method of submission accepted under any circumstances.*** *All homework scores (other than the lowest one) will contribute to your final grade. If you find yourself in an emergency and cannot deliver homework on time, immediately inform the instructor. Also, while working with other persons on non-graded example problems from the textbook is a good way to help you develop your understanding and insight into the techniques of problem solving, homework solutions must be your work only. Violations of this will not be tolerated and result in severe penalties for all parties*

involved, in strict compliance to official UTA policy.

*The points each assignment graded out of will be provided as part of its description. Assignments submitted late will be automatically penalized, at a rate of **30% of assignment max points per day late. Late submission will not be accepted 2 days after due date.** Note that for some assignments, submissions may not be accepted after the deadline (such assignments will be announced in class beforehand). The submission due time (and the time the link will be available till) will be shown in homeworks and Canvas. Exceptions will only be made for documented emergencies, in strict adherence to UTA policy. Computer/Network crashes, Submission of Incomplete files, Submission of Incorrect Files, Submitting at Incorrect Link are NOT acceptable excuses for late submissions. **No exceptions will be made.** To avoid problems with such crashes and last-minute problems, students are encouraged to submit as early as possible. They are also advised to ensure that their file was uploaded correctly before submitting it. You can always revise your submission till the deadline. If you are unable to work on/submit an assignment due to a valid documented reason (illness, critical family emergencies, military service obligations, observance of major religious holidays, and certain university service commitments) one makeup assignment may be provided that will be due during finals week.*

As a student enrolled in CSE 4392/5369, I have read and understood the assignment policy described above.

Name:
Student ID:

Academic Dishonesty Policy Acknowledgement:

If you are caught colluding or copying in the assignments or exams the following consequences will be applied.
Per offence:

- You will be given a score of 0 points for that assignment or exam.

- Your final grade will be reduced by 2 letter grades (Up to a minimum of F)

- An academic integrity violation form will be filed.

    – If you agree to sign the form

      ∗ You will be placed on disciplinary probation for 1 year and a 7 year reportable disciplinary record will be created.

      ∗ Additional violations may result in increasing sanctions up to and including suspension or expulsion.

    – If you do not agree to sign the form

      ∗ You will be temporarily given a grade of Incomplete (I)

       ∗ The Office of Academic Integrity will conduct a formal investigation based on evidence provided

       ∗ Based on decision, either the grade will be calculated with the penalty and with the consequences discussed above or grade will be calculated without penalties and no forms being filed.

*This policy is not up for discussion/negotiation **under any circumstances**.*
As a student enrolled in CSE 4392/5369, I have read and understood the academic dishonesty policy described above.

Name:
Student ID:

Problem 2 - 10%

Find a team mate for your Project! Please write down the names of your team members (including yourself):
Team Member 1 (my name):
Team Member 2 (my team mate's name, optional):
Team Member 3 (my team mate's name, optional):

Problem 3 – 20%

This problem focuses on understanding different types of ambiguity in natural language, as discussed in class.

1. **Types of Ambiguity**

   Based on the four types of ambiguity introduced in class (e.g., lexical ambiguity, syntactic ambiguity, semantic ambiguity, and discourse ambiguity), complete the following tasks:

   - For each type of ambiguity, provide **two example sentences**.
   - For each example, briefly explain the different possible interpretations and why it is classified as this type of ambiguity.

2. **Reflection Question**

   Answer the following questions based on your examples:

   - Which type of ambiguity do you think is the most difficult for NLP systems to handle? Why?

Problem 4 – 20%

This problem aims to help you become familiar with common NLP tasks and their real-world applications.

1. **Understanding NLP Tasks**

   From the given list of NLP tasks (Text Classification, Named Entity Recognition, Machine Translation, Text Generation, Question Answering, Speech Recognition, Text Summarization, Sentiment Analysis), choose **five** different NLP tasks. For each selected task, briefly answer the following questions:

   - What is the input to this task?
   - What is the output of this task?
   - Describe one real-world application scenario where this task is used.

2. **Experiencing Existing NLP Systems**

   From the five tasks you selected above, choose **two** tasks and explore existing NLP tools or systems. For each chosen task:

   - Provide one or two example inputs.
   - Show the corresponding outputs produced by the system.

3. **Reflection Question**

   Based on the NLP tasks you selected, which task do you think is the most complex, and why?