## Part 6: ONLY FOR STUDENTS ENROLLED IN CS 5740

This is an additional section, meant for only for students enrolled in a graduate version of the course, **CS 5740**. If you are enrolled in CS 4740, **DO NOT** complete this section. Please complete your answers in a PDF file in the format of your choice and submit the file to Gradescope CS 5740.

### Nested Named Entity Recognition

In this part of the homework assignment we hope for you to learn and think about a task of Nested Named Entity Recognition.

Frequently, named entities may have a complicated structure, making it difficult to identify tokens that need to be labeled and labels that need to be assigned. For instance, consider the sentence:

Cornell University professor of Computer Science developed a new course.

In this case, “Cornell University” is an entity, but so is “Cornell University professor of Computer Science”.

### Task

Please read the following survey paper of research done in the area of nested Named Entity Recognition and answer the questions below:

Wang, Yu, et al. "Nested Named Entity Recognition: A Survey." ACM Transactions on Knowledge Discovery from Data (TKDD) (2022). [PDF link](https://colab.research.google.com/corgiredirector?site=https%3A%2F%2Fdl.acm.org%2Fdoi%2Fpdf%2F10.1145%2F3522593%3Fcasa_token%3D6qJWjkaaQBAAAAAA%3AO3UlJUP-SCNLSIjW7TNmvkS9xUaisTTKTT7nALY9bPh1eVkNgJdjrNOqTHChA_whFQ6qrJXULOdFMg)

**Note**: you may skip section 4.2 of the paper.

### Analysis Questions

#### **Q6.1**:

What is Nested Named Entity Recognition task and what are its key differences from traditional NER we have seen in class and throughout this assignment? What makes nested NER a more challenging task?

#### **Q6.2**:

How do you think the models you trained in Parts 2 & 3 would behave when given sentences with nested named entities? Come up with your own 2-3 examples of nested named entities, test variations of these sentences against your models, reflect on your observations, and compare to your initial hypothesis. What kinds of entities get picked up and what information is missed?

#### **Q6.3**:

Choose any 2 approaches from the paper that are commonly used to capture nested entities and describe them.