# CS 348: Assignment 1

Spring 2024

(due by 5:00pm EDT on May 27)

Overview

This assignment consists of questions that concern the second version of the bibliography relational database schema introduced in Module 2 (reproduced below). In each case, you are given a requirement in English and your task is to translate a requirement for a query to a formulation in Relational Calculus (RC), and to translate a requirement for an integrity constraint to a closed RC condition.
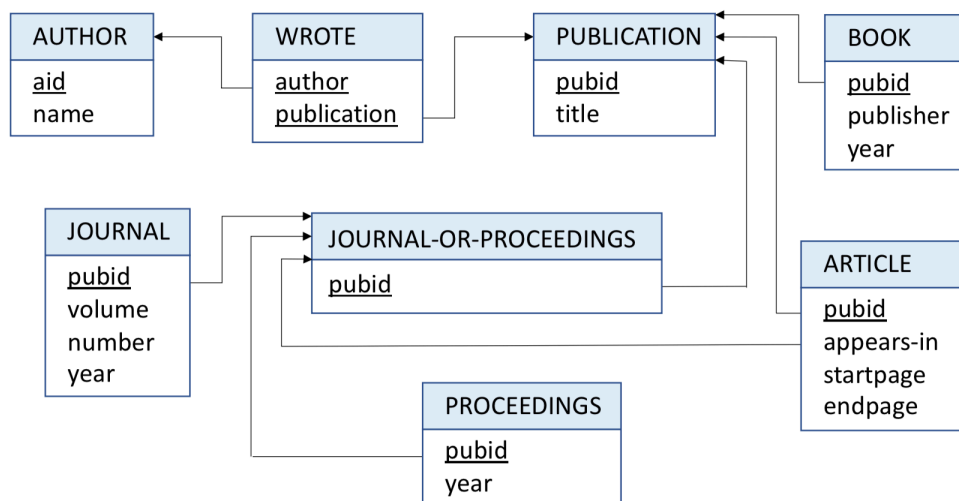
Assignment Submission

Assignment submission must be a single file uploaded to CrowdMark (detailed instructions to follow by email). Your solution to each of the questions below must be on separate page (with the question number clearly stated) and the pages must be in the order of the question numbers. The file must be a pdf file that may be computer generated or a scan/photo of a handwritten solution, as long as it is legible.

In formulating your answers to any of the questions, you are free (and encouraged) to use any syntactic sugar for conditions introduced in Module 2. You are also free to use conditions of the form "x op y" or "x op c", where "op" can be an *arbitrary* comparison operator ($<, \leq, =, \geq, >$).

Questions

1. Express as an RC query *ids and names of authors who have written two or more articles each of which has appeared in the same proceedings.*

2. Express as an RC query *titles and years of publication of books or articles written by someone named 'Doe'.*

3. Express as an RC query *ids of authors who have at least two publications that are books and for whom there is another author who has always been a coauthor of all their publications.*

4. Express as an RC query *ids and names of authors who have published either a book or a journal article in each year from 2015 to 2019 inclusive.*

5. Express as an RC query *ids of pairs of publications with at least one author and that have the same set of authors.*

6. Express as an integrity constraint that *no pair of articles that have appeared in the same journal or proceedings can have overlapping page ranges.*

7. Express as an integrity constraint that *neither journals nor proceedings may have authors.*