## **COSC 30603**

**Homework 4: Relational Algebra**

Due: Sep 23

Requirement: Your answers must be typed and printed.

Consider the following schema:

Publisher (name, phone, address), PK: name.

Book (ISBN, title, year, published\_by, previous\_edition), PK: ISBN, FK: published\_by refs Publisher, previous\_edition refs Book.

Author (SSN, first\_name, last\_name, address, income), PK: SSN.

Write(aSSN, bISBN), PK: (aSSN, bISBN), FK: aSSN refs Author, bISBN refs Book.

Author\_Editor(aeSSN, works\_for), PK: aeSSN, FK: aeSSN refs Author, works\_for refs Publisher.

Give relational algebraic expression or MySQL SQL for the following plain English language queries based on the above schema. Use the notations below.

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1. Provide the first name and last name of author-editors and the name and phone of the publishers that they work for. (15 pts)

|  |
| --- |
| select auth.first\_name, auth.last\_name,pub.name,pub.phone  from Author auth,Author\_Editor authe,Publisher pub  where authe.aeSSN=auth.SSN and works\_for.authe=pub.name; |

1. Provide the ISBN of those books whose authors include both Andy Smith and Mary Doe. (15 pts)

|  |
| --- |
| SELECT ISBN FROM Book INNER JOIN Write ON bISBN = ISBN  INNER JOIN Author ON aSSN = SSN WHERE (first\_name = "Andy" AND  last\_name = "Smith") OR (first\_name = "Mary" AND  last\_name = "Doe") |

1. Provide the ISBN of those books that have an author whose last name is Smith but do not have a coauthor whose last name is Doe. (15 pts)

|  |
| --- |
| SELECT b.ISBN from Book b  JOIN Write w ON w.bISBN = b.ISBN  JOIN Author a ON a.SSN = w.aSSN  WHERE a.last\_name like "Smith" AND a.last\_name NOT like "Doe"; |

1. Provide the SSN of those authors who have coauthored at least one book with the author named Andy Smith. (10 pts)

|  |
| --- |
| SELECT a.SSN from Author a  JOIN Write w ON w.aSSN = a.SSN  JOIN Book b ON b.ISBN= w.bISBN  WHERE a.first\_name like "Andy" |

1. Provide the SSN of those authors who have coauthored all the books written by Andy Smith. (10 pts)

|  |
| --- |
| SELECT a.SSN  FROM author a INNER JOIN author\_editor au  ON a.SSN = au.aSSN  WHERE a.first\_name = "Andy" and a.last\_name= "Smith"; |

1. Provide the ISBN of every book whose publisher is different from the publisher of its previous edition. (10 pts)

|  |
| --- |
| SELECT ISBN  FROM book  GROUP BY previous\_edition  HAVING previous\_edition != title; |

1. Provide the SSN and the income of every author, as well as the name of the publisher that the author works for if he/she is also an editor. (15 pts)

|  |
| --- |
| SELECT a.SSN, a.income, b.published\_by.  FROM (author a JOIN write w ON a.SSN = w.aSSN)  INNER JOIN book b ON w.bISBN = b.ISBN; |

1. Provide the title of the book that is the earliest book published by the publisher named “ABC”. (10 pts)

|  |
| --- |
| SELECT title FROM Book GROUP BY published\_by HAVING published\_by = "ABC" AND year=MIN(year); |