THE UNIVERSITY OF SYDNEY

School of Information Technologies

COMP9120 Relational Database Systems **Semester 2, 2016**

Tutorial Week 4 Solution: SQL and Relational Algebra

Exercise 1. SQL

Consider the following query:

```
SELECT S.Name
FROM Student S, Transcript T
WHERE S.studId = T.studId
AND T.uosCode IN ('INFO2005','INFO2120')
```

a) What does this query mean (express the meaning in one short English sentence)?

b) Write an equivalent SQL query without using the IN operator and the set construct.

c) Write the query in relational algebra.

Exercise 2. Reading Relational Algebra

Consider the following schema:

```
Book (isbn, title, publisher, publicationYear)
Author (aname, birthdate)
Publisher (pname, address)
Wrote (isbn, aname) // which author wrote which book
```

What is the English explanation of the following Relational Algebra expressions?

a) $\pi_{title,publicationYear}(Book)$

b) $\pi_{pname}(\sigma_{address='New\ York'}(Publisher))$

c) $\pi_{aname}(\sigma_{title='A\ First\ Course\ in\ Datbase\ Systems'}(Book \bowtie Wrote))$

d) $\pi_{address}(\sigma_{title='Databases' \vee title='Data\ Management'}(Publisher \bowtie_{pname=publisher} Book))$

Why do the two previous queries ((c) and (d)) have to formulate their joins differently?

Exercise 3. Writing Relational Algebra

For the same schema as above, use relational algebra to express the following queries:

a) Find all book titles published by Acme Publishers

b) Find all authors (just by name) of the book with ISBN 0444455551

c) Find all authors (name) who published at least one book with Acme Publishers

d) Find all authors (name) who never published a book with Acme Publishers.