

**CSC 370 — Database Systems**  
**Summer 2015**  
**Assignment No. 8**

Note 1 **This assignment is to be done individually**

- Deadline: July 21
- This assignment is worth 1% of your total course mark.

### **Objectives**

After completing this assignment, you will:

- Understand query evaluation plans of basic queries.

### **Your task, should you choose to accept it**

#### **Part A**

From the textbook, solve exercises:

1. 15.3.3
2. 15.4.3

#### **Part B**

Consider the following three queries:

1. `SELECT title, year FROM  
productions NATURAL JOIN directors NATURAL JOIN persons  
WHERE lastname = 'Nolan' and firstname = 'Christopher' and pindex = 'I';`
2. `SELECT title, year FROM  
productions NATURAL JOIN directors NATURAL JOIN persons  
WHERE pid = 'Nolan, Christopher (I)';`
3. `SELECT title, year FROM  
productions NATURAL JOIN directors NATURAL LEFT JOIN persons  
WHERE pid = 'Nolan, Christopher (I)';`

For each query:

- Draw a parsing tree (any parsing tree) equivalent to the query. Make sure to include all operations involved in the query.
- Use EXPLAIN to find the query evaluation plan used by postgresql. Draw it as a tree. Note that this tree will not include selections nor projections, since they are done on the fly.

- Annotate the tree with:
  - Access paths to each relation
  - Algorithms used in each of the operations
  - Number of expected tuples output by each operation.

### **Part C**

Compare queries 2 and 3 and their evaluation plans.

- Briefly explain the difference between the two queries.
- Briefly explain the difference in the evaluation plans that postgresql will use to answer these queries.
- Why is postgresql not using one relation at all to answer query 3?
- Use EXPLAIN ANALYZE to execute the queries. Run each query 5 times.
  - What is the estimated time and the average actual time needed to run queries 2 and 3?
  - How much faster/slower is postgresql expecting query 2 to be than query 3?
  - When they are executed, on the average, how much faster/slower is query 2 than query 3?

### **What to submit**

At the beginning of the class, submit a paper copy of your assignment.