

EXERCISE 7: QUERY OPTIMIZATION*

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1 Exercise 1

Consider 3 relations $r(ABC)$, $s(CDEFG)$, $t(EHK)$ và 2 relational algebra expressions

- $\pi_{BK} (\sigma_{A=a \wedge D=d} (\sigma_{s.E=t.E} ((r * s) \times t)))$
- $\pi_{BK} (\pi_{BC} (\sigma_{A=a} r) * \pi_C (\sigma_{D=d} s) * \pi_{EK} (t))$

1. Are these two expressions equivalent? Justify your answer
2. Using the transformation rules and heuristic algebraic optimization algorithm, optimize the first expression.

2 Exercise 2

Consider the following query:

```
SELECT Name, Address
FROM EMPLOYEE E , DEPARTMENT D
WHERE D.Name = 'Research' AND D.DeptId = E.DeptId;
```

1. Draw at two query trees that can represent this query.
2. Draw the initial query tree for the query and show how the query tree is optimized

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