Week 7: Worksheet
CSC 343 Winter 2021
University of Toronto Mississauga

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Overview

Recap: Base Operators

Recap: Extended Operators

Let's do an example together!

Given the following relations:

> **Flights**(<u>fno:integer</u>, from:string, to:string, distance:integer, departs:time, arrives:time)
>
> **Aircraft**(<u>aid:integer</u>, aname:string, cruisingrange:string)
>
> **Certified**(<u>eid:integer</u>, <u>aid:integer</u>)
>
> **Employees**(<u>eid:integer</u>, ename:string, salary:integer)

<u>Note</u>: the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft (otherwise, they would not qualify as a pilot), and only pilots are certified to fly.

Write the following queries in Relational Algebra (RA):

1. Find the eids of pilots certified for some Boeing aircraft.

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2. Find the aids of all aircraft that can be used on non-stop flights from Toronto to Miami.

3. Find the names of pilots who can operate planes with a range greater than $3,000$ miles but are not certified on any Boeing aircraft.

Recall!

Given the following relations:

Suppliers(<u>sid:integer</u>, sname:string, address:string)

Parts(<u>pid:integer</u>, pname:string, colour:string)

Catalog(<u>sid:integer</u>, <u>pid:integer</u>, cost:real)

<u>Please note</u>: keys for each relation are denoted with an underlined. Additionally, the Catalog relation lists the prices charged for parts by Suppliers (i.e. cost).

Last Time:

Find the sids of suppliers who supply some red or green part.

Sample Solution:

SELECT DISTINCT C.sid

FROM Catalog C, Parts P

WHERE (P.colour = 'red' **OR** P.colour = 'green') **AND** P.pid = C.pid;

Task!

Utilizing the same relations and sample SQL query above, convert them into Relational Algebra. <u>Note</u>: your SQL query may not translate directly, so you may need to alter the query above.

Find the sids of suppliers who supply some red or green part.

Last Time:

Find the `pids` of parts supplied by at least two different suppliers.

Sample Solution:
> **SELECT DISTINCT** `C.pid`
> **FROM** `Catalog C`
> **WHERE EXISTS** (**SELECT** `C1.sid`
> > > **FROM** `Catalog C1`
> > > **WHERE** `C1.pid = C.pid` **AND** `C1.sid <> C.sid`);

Task!

Utilizing the same relations and sample SQL query above, convert them into Relational Algebra. Note: your SQL query may not translate directly, so you may need to alter the query above.

Find the `pids` of parts supplied by at least two different suppliers.