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Practice Midterm 1
Fall 2020 CS 34800 - Merge

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Attempt

> Attempt 1

Attempt 1

Connor Brown (Id: 028687730)

Available until Oct 23, 2020 9:30 AM

Written: Oct 15, 2020 1:06 PM - Oct 15, 2020 2:39 PM

Quizzes Event Log

Timing

Time Spent: 1:32:53

Recommended Time Limit: 3:00:00. Not exceeded

Grading Feedback

Auto-Grade

Final Score *

> 3

/ 75
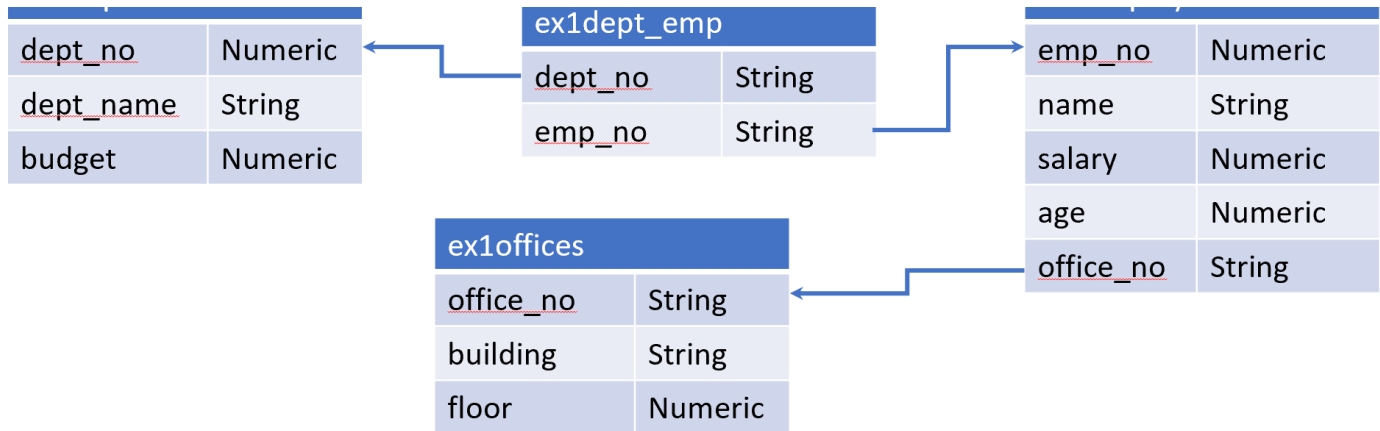
Student View Preview

3 / 75 - 4 %

Attempt Feedback

Quiz Results

SQL and Relational Algebra Queries

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dept_no	Numeric
dept_name	String
budget	Numeric

ex1dept_emp

dept_no	String
emp_no	String

ex1offices

office_no	String
building	String
floor	Numeric

emp_no	Numeric
name	String
salary	Numeric
age	Numeric
office_no	String

▷ **Expand section feedback**

Question 1

(SQL) For each department, list the department number, name,
and the average salary for the department employees.
An example output when running the query on the supplied data set:

dept_no	dept_name	avg(salary)
1	Accounting	80000.00000
2	Research and Development	89000.00000
3	Facilities	86000.00000

Select d1.dept_no, d1.dept_name, avg(salary)

From ex1departments d1 join ex1dept_emp de1 join ex1employees e1

Where d1.dept_no = de1.dept_no AND de1.emp_no = e1.emp_no

Group by de1.dept_no;

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Score

[   ] / 10 (not auto-graded: a default value of 0 was assigned)

▷ **Expand question feedback**

Question 2

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office_no	building	floor	avg_age
ABC 213	ABC	2	36.0000

Select o1.office_no, building, floor, avg(age) as avg_age

From ex1offices o1 join ex1employees e1

Where o1.office_no = e1.office_no

Group by o1.office_no

Having avg_age < (Select avg(age)

From ex1employees);

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Score

[   ] / 10 (not auto-graded: a default value of 0 was assigned)

▷ Expand question feedback

Question 3

(SQL) list department number, name, and budget for departments whose total employee salaries exceeds (is greater than) one tenth (1/10) of the department budget.
An example output when running the query on the supplied data set:

dept_no	dept_name	budget
2	Research and Development	2000000.00
3	Facilities	1500000.00

Select de1.dept_no, dept_name, budget

From ex1dept_emp de1 join ex1employees e1 join ex1departments d1

Where de1.dept_no = d1.dept_no and e1.emp_no = de1.emp_no

Group by de1.dept_no

Having Sum(salary) > budget/10;

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▷ Expand question feedback

Question 4

Using the union operator, write a relational algebra query to find the names of employees who work in both the Accounting and Research-and-Development departments. Write your relational algebra on paper (or use your favorite tool), take a photo (or scan) your solution, and upload the solution using the add-file button below.

EmpInAcc <- Theta(dept_name = 'Accounting') (ex1employees) Join (ex1dept_emp) Join (ex1departments)

EmpInRnD <- Theta(dept_name = 'Research and Development') (ex1employees) Join (ex1dept_emp) Join (ex1departments)

BothDeps <- EmpInAcc Union EmpInRnD

Result <- Pi(name) (BothDeps)

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Score

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Question 5

Consider relations r(A B C) and s(D E F). The leftyjoin of r with s on r.C = s.D. written:
$r \ ¥_{r.C=s.D} \ s$ consists of every tuple in r that joins with at least one tuple in s. For example, if r and s are given as:

r(A	B	C)		s(D	E	F)
a1	b1	c1		c1	e1	f1
a1	b1	c2		c3	e1	f2
a2	b1	c3		c3	e2	f2
a2	b2	c2		c4	e2	f1
				c5	e1	f2

a2   b1   c3

a. Compute s $\bar{Y}_{r.C=s.D}$ r
   Write your answer in the text box below.

b. Show how leftyjoin can be computed by the relational algebra operators we already have
   (select, project, cross product, join, union, intersect, difference). Use the text box below to
   write your answer (including a description of any relational algebra you may want to use).

a,
(D E F)
c1 e1 f1
c3 e1 f2
c3 e2 f2

b.
PI(D,E,F) Theta(r.C = s.D) (r) Join (s)

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Score

[   ] / 10 (not auto-graded: a default value of 0 was assigned)

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True and False Questions

▷   Expand section feedback

Question 6

A table can have multiple keys.

⇒ ( ) True

✗ ( ) False

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Score

0 / 1 (auto-graded)

▷   Expand question feedback

Question 7

We can always update a view.

○ True

✓ ○ False

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Score

1 / 1 (auto-graded)

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Question 8

Unknown AND (TRUE OR FALSE) = TRUE

○ True

✓ ○ False

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Score

1 / 1 (auto-graded)

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Question 9

Having a private data center costs about the same as paying to use cloud resources.

○ True

✓ ○ False

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Score

1 / 1 (auto-graded)

▷ Expand question feedback

Question 10

When transforming an ERD to a relational schema, a many-to-many relationship set in ERD between entity sets e1 and e2 translates to adding the primary key of e1 in the table that represents e2 and vice versa.

✗ ○ True

➡ ○ False

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Score

0 / 1 (auto-graded)

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Question 11

Draw an ER diagram for the following scenario:
- There are books, identified by ISBN, and each book has a title, edition, and number of pages.

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authors to have the same name and the same date of birth. Authors write books. For example, Avi Silberschatz has written the "Database System Concepts" and "Operating System Concepts" books. Note that Henry Korth and S. Sudarshan are also authors for the "Database System Concepts" book.
• A new edition of a book can replace an older edition. For example, the "Database System Concepts" 7th edition replaced the 6th edition of the book. The two editions have different ISBN numbers.

For the scenario above, use only three entities: Book, Publisher, and Author. Use only the description and the example data provided to decide what attributes, relationships, and cardinalities you include in your ERD. If the minimum cardinality is not clarified in the text, then you can use either 0 or 1. Draw your ERD on paper (or using your favorite tool) and upload a photo of your ERD using the add-file button below. Use the textbox, to write any notes you have.

- No text entered -

📄 q11answer.pdf (34.49 KB)

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[   ] / 20 (not auto-graded: a default value of 0 was assigned)

▷   Expand question feedback