Name: _____
Score: _____ / _____

Quiz 2 - Fall 2021

Part 1

Why is a database normally stored on a Hard Disk rather than in Main Memory? Select all that apply

- ☐ A. Because the hard disk takes up less physical space than main memory.
- ☐ B. Because the hard disk is cheaper than main memory.
- ☐ C. Because the hard disk can store more data than main memory.
- ☐ D. Because the hard disk is less volatile than main memory.
- ☐ E. Because the hard disk is faster access than main memory.

Answer Point Value: 2.5 points
Answer Key: B, C, D

Which of the choices below would be considered good reasons for using a heap file organization (Select ALL that apply)?

- ☐ A. The file (table/relation) is very small
- ☐ B. The data will often be bulk loaded into the relation/table.
- ☐ C. The data will have to be sorted often
- ☐ D. Every time we use this table, we will need to get every single tuple/record
- ☐ E. Lots of searches will be required on the file

Answer Point Value: 2.5 points
Answer Key: A, B, D

When adding the following values to a B+ tree with order 3 and pleaf=2, after adding all of the items below, what value will be in the root node? If 2 values will be in the root after all the values are added then select both values. You must go left down the tree for <= (less than or equal) and you must go right down the tree for > (greater than).
Values to be inserted into B+ tree in THIS order:
8, 33, 44, 22, 10, 5, 4

- ☐ A. 22
- ☐ B. 44
- ☐ C. 33
- ☐ D. 10
- ☐ E. 8
- ☐ F. 3
- ☐ G. 5

Answer Point Value: 2 points
Answer Key: A, E

Which of the following operations below will give us closure over strings? Check all that apply.

- ☐ A. Concatenate two strings - returns the 2 strings joined together
- ☐ B. Length of a string - returns the number of characters in the string
- ☐ C. Trim a string (remove the spaces at the beginning and end of a string) - returns the trimmed string
- ☐ D. Position of one substring inside another - returns the position where one string is found inside another string. If the string is not found, then it returns -1.

Answer Point Value: 2 points
Answer Key: A, C

How many rows will be returned from $\sigma_{d='B'}(A)$:

Attachments

Table A:

a	b	c	d
1	3	6	B
2	3	7	B
1	3	7	B
1	3	8	C

Table B:

d	e
B	3
B	2
A	1

- A. 1
- B. 2
- C. 3
- D. 4
- E. None of the above

Answer Point Value: 2 points
Answer Key: C

How many rows will be returned from: πd(A)

Table A

a	b	c	d
1	3	4	1
2	3	5	1
4	2	5	6

Table B

b	f	g
3	7	5
5	9	8

- A. 1
- B. 2
- C. 3
- D. None of the above

Answer Point Value: 1 points

Answer Key: B

How many rows will be returned from: πd(A) - πd(B)

Attachments

Table A:

a	b	c	d
1	3	6	B
2	3	7	B
1	3	7	B
1	3	8	C

Table B:

d	e
B	3
B	2
A	1

- A. 0
- B. 1
- C. none of the above
- D. 3
- E. 2

Answer Point Value: 2 points

Answer Key: B

Attachments

Table A:

a	b	c	d
1	3	6	B
2	3	7	B
1	3	7	B
1	3	8	C

Table B:

d	e
B	3
B	2
A	1

Accepted characters: numbers, decimal point markers, sign indicators (-), spaces (e.g., as thousands separator, 5 000), "E" or "e" (used in scientific notation). **NOTE:** For scientific notation, a period MUST be used as the decimal point marker.

There will be ____ row(s) returned from **(A ⋈ B)**

Answer Point Value: 1 points

Answer Key: 6

Accepted characters: numbers, decimal point markers, sign indicators (-), spaces (e.g., as thousands separator, 5 000), "E" or "e" (used in scientific notation). **NOTE:** For scientific notation, a period MUST be used as the decimal point marker.

Assume we have the following two tables, A and B

Table A:

aa	***bb***	***cc***
a1	b1	c1
a2	b2	c2
a2	b1	c5
a1	b2	c4

Table B:

baa	***bff***
a1	c1
a4	b1
a5	c5

If we execute the relational algebra formula: $(A \bowtie_{aa=baa} B)$ then the resulting table will contain ____ tuples and ____ attributes.

Answer Point Value: 2 points
Answer Key: 2, 5

Given the following two tables: AA and BB:

AA

a	**b**
a1	b3
a2	b3

BB

a	c	d
a1	c1	d1
a1	c3	d2
a3	c1	d3

The operation:

AA ∪ BB

Will produce how many tuples?

- A. Less than 4
- B. 4
- C. 5
- D. More than 5
- E. This operation cannot be done as these tables are not union compatible

Answer Point Value: 1 points
Answer Key: E

Given the following two tables:

Table AA:

S#	SNAME	STATUS	CITY
S2	Jones	10	Paris
S5	Adams	30	Athens

Table BB:

S#	P#	QTY
S2	P1	300
S2	P2	400
S7	P3	200

Then this relation below (Table AA **joined with** Table BB) is an example of what kind of join?

S#	SNAME	STATUS	CITY	P#	QTY
S2	Jones	10	Paris	P1	300
S2	Jones	10	Paris	P2	400
S5	Adams	30	Athens	*NULL*	*NULL*

- A. Full Outer Join
- B. Natural Join
- C. Left Outer Join
- D. Right Outer Join

Answer Point Value: 1 points
Answer Key: C

Given the following tables

PLAYER:

PlayerID	FirstName	LastName	TeamID*
232	Peter	Griffin	44
555	Bart	Simpson	44
432	Fred	Flintstone	44
111	Hannah	Montana	55

TEAM:

TeamID	TeamName	City	CaptainPlayerID*
44	Jays	Toronto	432
55	Mustangs	London	111

Match the relational algebra query to what it represents in English.

A. $\pi_{TeamName}(TEAM)$

1. Show me the team names of all the teams
2. Show me the first name of all players who play for a Toronto team
3. Show me the team names of all Toronto teams
4. Show me the first name of all team captains.
5. Show me the first name of all team captains for Toronto teams.

B. $(\pi_{FirstName}(TEAM \bowtie_{CaptainPlayerID=PlayerID} PLAYER))$

C. $(\pi_{FirstName}(\sigma_{City='Toronto'}(TEAM)) \bowtie PLAYER)$

D. $(\pi_{TeamName}(\sigma_{City='Toronto'}(TEAM))$

E. $(\pi_{FirstName}(\sigma_{City='Toronto'}(TEAM) \bowtie_{CaptainPlayerID=PlayerID} PLAYER))$

Answer Point Value: 5 points
Answer Key: 1:A, 2:C, 3:D, 4:B, 5:E