

Quiz 5

| | |
|-------------------|---------------------------------|
| Deadline | Friday, 23 April 2021 at 9:00PM |
| Latest Submission | Friday, 23 April 2021 at 6:18PM |
| Raw Mark | 3.00/4.00 (75.00%) |
| Late Penalty | N/A |
| Final Mark | 3.00/4.00 (75.00%) |

Question 1 (1 mark)

Consider a table of machine parts (*Parts(id,name,colour,size,cost)*), about which we have the following information:

```
db=# select count(distinct size) from Parts;
count
-----
      5
```

```
db=# select min(size) from Parts;
min
-----
tiny
```

```
db=# select max(size) from Parts;
max
-----
huge
```

```
db=# select count(*) from Parts;
count
-----
6507
```

Approximately how many tuples would you expect to find in the result of the following query?

```
select * from Parts where size = 'huge';
```

Assume a uniform distribution of part sizes.

| | |
|------------------------------|------|
| (a) <input type="checkbox"/> | 650 |
| (b) <input type="checkbox"/> | 3253 |
| (c) <input type="checkbox"/> | 6506 |

| | |
|---|--------------------------------------|
| (d) <input checked="" type="checkbox"/> | 1301 |
| (e) <input type="checkbox"/> | None of the other options is correct |

✓ Your response was correct.

Mark: 1.00

Question 2 (1 mark)

What is the most efficient relational algebra expression likely to be produced by a query optimizer on the following relational algebra expression?

$\text{Proj}[a,b](\text{Sel}[a>5](R \text{ Join}[a=d] S))$

where the relations are $R(a,b,c)$ and $S(d,e)$ and $S.d$ is a FK referencing $R.a$.

| | |
|--------------------------------------|---|
| (a) <input type="radio"/> | $\text{Proj}[a,b](\text{Sel}[a>5](R \times S))$ |
| (b) <input type="radio"/> | $\text{Proj}[a,b]((\text{Sel}[a>5]R) \text{ Join}[a=d] S)$ |
| (c) <input type="radio"/> | $(\text{Proj}[a,b](\text{Sel}[a>5]R)) \text{ Join}[a=d] S$ |
| (d) <input checked="" type="radio"/> | $\text{Proj}[a,b] ((\text{Sel}[a>5]R) \text{ Join}[a=d] (\text{Proj}[d]S))$ |
| (e) <input type="radio"/> | None of the above is more efficient than the original RA expression |

✗ Your response was incorrect.

The correct response was: (b)

Mark: 0.00

There is debate about (b) or (d) would be the "correct" answer, so I accepted both.

Unfortunately, Webcms3 cannot show both answers as correct.

Don't assume, just because it says that your (b) or (d) answer is wrong, that you didn't get the mark.

Look at the **sturec** page to see whether the mark has been added.

Question 3 (1 mark)

Which of the schedules below represent possible concurrent executions of the transactions

T1: R(X) R(Y) W(X) W(Y)
T2: W(X) W(Y) W(Z)

Notes: there may be multiple correct answers; we are *not* asking about in serializability.

| | |
|---|------------------------------------|
| (a) <input checked="" type="checkbox"/> | R(X) W(X) R(Y) W(Y) W(X) W(Z) W(Y) |
| (b) <input checked="" type="checkbox"/> | W(X) R(X) W(Y) R(Y) W(Z) W(X) W(Y) |
| (c) <input checked="" type="checkbox"/> | R(X) R(Y) W(X) W(Y) W(X) W(Y) W(Z) |
| (d) <input type="checkbox"/> | R(X) W(Y) R(Y) W(X) W(X) W(Z) W(Y) |
| (e) <input type="checkbox"/> | W(X) R(Y) W(X) R(Y) W(Y) W(Z) W(Y) |

✓ Your response was correct.

Mark: $\max(0.33 + 0.33 + 0.33, 0) = 1.00$

Question 4 (1 mark)

conflict

serializability checking uses a precedence graph to determine whether a concurrent schedule is equivalent to some serial schedule of the same transactions.

✓ Your response was correct.

Mark: 1.00

Precedence graphs are used in **conflict** serializability