Exam 1

Question 1

Not complete

Marked out of 10

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Arrange the SQL-operators in order corresponding to the relational operations.

$\pi_{A,C}(R)$ Choose...

$\sigma_{\theta}(R)$ Choose...

$R \times S$ Choose...

$R \bowtie S$ Choose...

$R \underset{\theta}{\bowtie} S$ Choose...

$\delta(R)$ Choose...

$\gamma_{B,AVG(C)\rightarrow X}(R)$ Choose...

Check

Next

Calculate the result of the relational algebra expression: $\sigma_{B<E}$ [redacted] $S)$. Attributes must be ordered by English alphabet, values in the first column must be sorted in ascending order.

R

A	*B*	*C*
1	30	1
2	10	3
3	30	1
4	5	2

S

D	*E*
1	40
2	10
3	10
4	20
5	6
6	40

[redacted]

Let database scheema be the following: $R(A, B, C); S(D, E, F); Q(A, D, G)$ Construct an SQL-operator corresponding to the following relational algebra expression: $\pi_{[redacted]=3}(Q)))$.

SELECT

FROM

WHERE

AND

AND

Che

Match the query processing stages with structures generated by them.

Logical optimization	Choose...
Logical query plan generating	Choose...
View resolution and Semantic checking	Choose...
Execution (interpretation) of the physical query plan	Choose...
Syntax analysis	Choose...
Physical query plan generating	Choose...

Check

Mark by letters:

s - syntactic categories which are not base syntactic categories;

b - base syntactic categories;

a - atoms.

▾ <Attribute>

▾ <

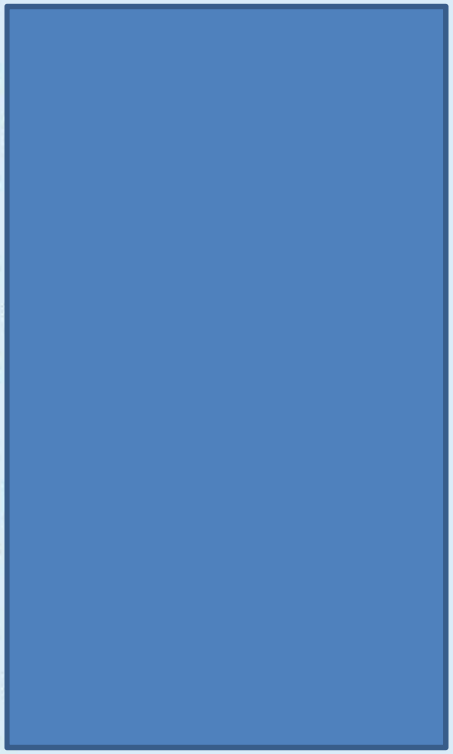
▾

▾

▾

▾

▾



Mark three expressions admitted by the grammar:

<A> ::= <B>=<B>

<B> ::= (<B>)

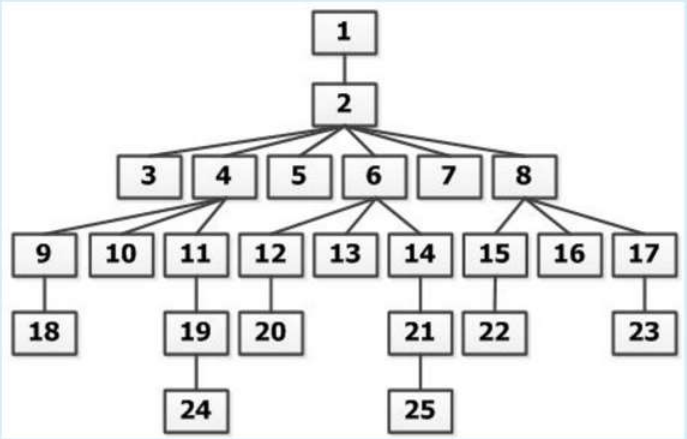
<B> ::= <B> + <B>

<B> ::= <B> - <B>

<B> ::= 0 | 1 | 2 | 3 | 4

Select one or more:

- [redacted]
- [redacted]
- [redacted]
- 1+2=3
- [redacted]
- [redacted]
- [redacted]



Given the database schema: R(A,B) and S(B,C). Match the parse tree nodes with syntactic categories and atoms for the following query:

SELECT [redacted]

Use the simplified SQL grammar.

1 ▾

2 ▾

3 ▾ 4 ▾ 5 ▾ 6 ▾ 7 ▾ 8 ▾

9 ▾ 10 ▾ 11 ▾ 12 ▾ 13 ▾ 14 ▾ 15 ▾ 16 ▾ 17 ▾

18 ▾ 19 ▾ 20 ▾ 21 ▾ 22 ▾ 23 ▾

24 ▾ 25 ▾

Mark four actions that are performed by preprocessor during building the normalized parse tree.

Select one or more:

- [ ] Syntax analysis
- [ ] Check and resolve attribute uses
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

Given the database schema: R(A,B,C,D); S(D,E,F,G). For the logical optimization, we use the following law: π_A [redacted] $S)$). Write in alphabetical order all the attributes which must be included into the following lists (spaces are not allowed, use comma as a separator, don't use dot at the end):

β

γ

Formulate the methods for logical optimization:

1. Push the projections .
2. P
3. P
4.

Given relations: R(A,C) и S(B,A,D). Mark wrong laws below, if you have found those. Otherwise, select the alternative "All right."

Select one or more:

- $R \underset{C>B}{\bowtie} S = \sigma_{C>B}(R \times S)$
- 
- All right

Arrange the components of record address on the disk, in order from the general to the particular, by dragging them with the mouse to the right position.

1.
2.
3.
4.

Offset of the beginn

Numb

Nu

N

Match the logical database objects with phisical ones.

Tuple Choose...

Attribute Choose...

Relation Choose...

Relation R includes 10 tuples allocated in four blocks R1, ..., R4. Each block can hold not more than 3 tuples. The interface of buffer pool manager includes the following operations:

ReadBlock(<Block pointer>,<Buffer number>) - reads specified block from disk into specified buffer;

WriteBlock(<Block pointer>,<Buffer number>) - writes specified buffer into specified block on the disk.

The size of buffer is equal to the size of block. To execute a query, we have to scan all tuples of the relation R and update the 6-th tuple. Mark two correct sequences of operations of the buffer pool manager, on the assumption that the system has only two buffers.

Select one or more:

- [ ] ReadBlock(R1,1); ReadBlock(R2,1); WriteBlock(R2,1); ReadBlock(R3,2); ReadBlock(R4,1)
- [ ] ReadBlock
- [ ] ReadBlock
- [ ] ReadBlock
- [ ] ReadBlock