

DBMS

FD's & Normalization

DPP 01

[MSQ]

1. According to RDBMS rules, choose the correct statement from the following.
- A relation in RDBMS can have multiple attributes
 - A relation in RDBMS is a set of rows and columns
 - A tuple in a relation can have multiple values for an attribute.
 - All of the above

[NAT]

2. Consider the student relation shown below with schema stud (Sname, S age, S mail, S marks),

Stud

Sname	Sage	Smail	Smarks
Rohit	28	R@pw.live	68
Kanika	25	K@pw.live	75
Pankaj	25	K@pw.live	75
Rohit	28	R@pw.live	88
Anjali	26	A@pw.live	75

For the above given instance how many 2-set of attributes can determine a row uniquely?

[MSQ]

3. Consider a relation schema $R(A, B, C, D, E, F, H)$ with the given Functional dependency set:
 $\{A \rightarrow BC, C \rightarrow AD, DE \rightarrow F, C \rightarrow F\}$
 The attribute closure that contains all the attributes of the relation R is?
- AE^+
 - CE^+
 - AEH^+
 - All of the above

[NAT]

4. Consider the below relation schema Stud (Rid, name, course, mail, phone) with FD set as:
- $Rid \rightarrow \{Rid\}$
 $Rid \rightarrow \{name, mail\}$
 $course \rightarrow \{course, phone\}$

$phone \rightarrow \{phone\}$

$mail \rightarrow \{Rid, course\}$

$name \rightarrow \{phone, mail, course\}$

The number of non-trivial FD's in the given FD set is/are?

[MCQ]

5. Consider the following set of FD's:
 $\{V \rightarrow W, W \rightarrow XZ, X \rightarrow YZ\}$ for relation $R(V, W, X, Y, Z)$
 Then the attribute closure of YZ^+ contains how many elements?
- 0
 - 1
 - 2
 - 3

[MCQ]

6. For the given FD set: $\{P \rightarrow QT, Q \rightarrow SU, V \rightarrow U\}$ of a relation $R(P, Q, T, S, U, V)$. Find the set of attributes that is Super key but not a Candidate key?
- PTQ
 - PV
 - PQV
 - QV

[MCQ]

7. In a schema with attribute X, Y, Z, W, V , the following set of functional dependencies are given:
 $\{Y \rightarrow X, Y \rightarrow Z, ZW \rightarrow V, X \rightarrow W, V \rightarrow X\}$.
 Which of the following FD is not implied by the above set?
- $YX \rightarrow ZW$
 - $XV \rightarrow YZ$
 - $ZW \rightarrow V$
 - $XV \rightarrow XW$

[MSQ]

8. Choose the correct statement from the following.
- The cardinality is defined as the number of attributes in a relation.
 - Degree of the relation is the number of tuples in the relation.

- | | |
|--------------------------------------------------------------------------------------------|----------------------|
| (c) Relation instance is the set of tuples of a relation at a particular instance of time. | (d) All of the above |
|--------------------------------------------------------------------------------------------|----------------------|

Answer Key

- | | |
|-----------|--------|
| 1. (a, b) | 5. (c) |
| 2. (1) | 6. (c) |
| 3. (c) | 7. (b) |
| 4. (3) | 8. (c) |



Hints & Solutions

1. (a, b)

A relation in RDBMS can have multiple attributes/fields/Columns but every tuple should be unique. Thus, according to RDBMS guidelines, A tuple in a relation cannot have multiple values for an attribute.

A relation is a table and a table is a set of rows and columns.

2. (1)

We can clearly observe that none of the attribute can determine a tuple uniquely (Single attribute), if we check for 2-attribute set then only (Sname, Smarks) can determine a row uniquely for the instance. So the answer is 1.

3. (c)

The attribute closure $AE^+ = \{A, B, C, D, E, F\}$.

The attribute closure $CE^+ = \{C, E, A, B, D, F\}$.

But the attribute H is missing from the closure.

The attribute closure $AEH^+ = \{A, B, C, D, E, F, H\}$.

Therefore, C is the correct answer.

4. (3)

Trivial FD's: 2 i.e. $Rid \rightarrow Rid$ and $phone \rightarrow phone$.

Non-trivial FD's: 3 i.e. $Rid \rightarrow \{name, mail\}$, $mail \rightarrow \{Rid, course\}$ and $name \rightarrow \{phone, mail, course\}$.

Semi-non trivial FD's: 1 i.e. $course \rightarrow \{course, phone\}$.

5. (c)

The attribute closure of $YZ^+ = \{Y, Z\}$ no other attribute can be determined by YZ^+ . Therefore only 2 elements that is Y and Z are in the YZ^+ closure.

6. (c)

The key for the given FD set.

$\{P \rightarrow QT, Q \rightarrow SU, V \rightarrow U\}$

$PV^+ = \{P, Q, T, V, U, S\}$

$PVQ^+ = \{P, Q, T, V, U, S\}$

$PTQ^+ = \{P, T, Q, S, U\}$

$QV^+ = \{Q, V, S, U\}$

we have PV^+ as the candidate key and also it is the super key. PVQ^+ is the super key but it is not a Candidate Key (not minimal set)

NOTE: A candidate key is minimal set of attributes that determine relational table uniquely. Also, every candidate key is a Super key but every Super key need not be Candidate.

7. (b)

$YX^+ = \{Y, X, Z, W, V\}$

$XV^+ = \{X, V, W\}$

$ZW^+ = \{Z, W, V, X\}$

$XV^+ = \{X, V, W\}$

8. (c)

- Cardinality is defined as the number of tuples in a relation.
- Degree is defined as the number of attributes in a relation.
- Relation instance is the set of tuples of a relation at a particular instance of time.



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