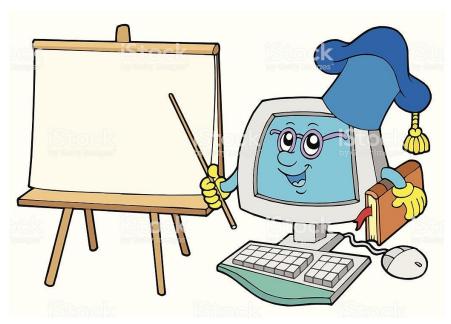


HIGHER SECONDARY SECOND YEAR COMPUTER SCIENCE

UNIT IV - Database concepts and MySql BOOK BACK QUESTION & ANSWERS 2024 - 25



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CHAPTER 11: Database Concepts

Choose the best answer: (1 Mark)

- 1. What is the acronym of DBMS?
 - (A) DataBase Management Symbol
- (B) Database Managing System
- (C) DataBase Management System
- (D) DataBasic Management System

- 2. A table is known as
 - (A) tuple
- (B) attribute
- (C) relation
- (D) entity
- 3. Which database model represents parent-child relationship?
 - (A) Relational
- (B) Network
- (C) Hierarchical (D) Object
- 4. Relational database model was first proposed by
 - (A) E F Codd
- (B) E E Codd
- (C) E F Cadd
- (D) E F Codder
- 5. What type of relationship does hierarchical model represents?
 - (A) one-to-one
- (B) one-to-many (C) many-to-one
- (D) many-to-many
- 6. Who is called Father of Relational Database from the following?
 - (A) Chris Date
- (B) Hugh Darween
- (C) Edgar Frank Codd
- (D) Edgar Frank Cadd
- 7. Which of the following is an RDBMS?
 - (A) Dbase
- (B) Foxpro
- (C) Microsoft Access
- (D) SQLite
- 8. What symbol is used for SELECT statement?
 - (A) σ
- (B) ∏
- (C) X
- (D) Ω

- 9. A tuple is also known as
 - (A) table
- (B) row
- (C) attribute
- (D) field

- 10. Who developed ER model?
 - (A) Chen
- (B) EF Codd
- (C) Chend
- (D) Chand

Answer the following questions: (2 Marks)

1. Mention few examples of a DBMS.

- dbase * Foxpro * MySQL
- Oracle * FileMakerPro

2. List some examples of RDBMS.

- MySQL * Oracle * SQL Server
- IBM DB2 * MariaDB * SQLite

3. What is data consistency?

• Data Consistency means that data values are the same at all instances of a database.

4. What is the difference between Hierarchical and Network data model?

Hierarchical data model	Network data model
A child record has only one parent	A child may have many parent nodes.
node	
It represents one-to-one relationship	It represents the data in many-to-many
called parent-child relationship in the	relationships.
form of tree structure	_

5. What is normalization?

• Normalization is an integral part of RDBMS in order to reduce data redundancy and improve data integrity.

Answer the following questions: (3 Marks)

1. What is the difference between Select and Project command?

Select Command	Project Command
_	The projection method defines a relation that contains a vertical subset of Relation.
with tuples according to a given condition.	
	The projection eliminates all attributes of the
that do not satisfy.	input relation but those mentioned in the projection list.
Symbol :σ	Symbol : Π

2. What is the role of DBA?

- Database Administrator or DBA is the one **who manages the complete database** management system.
- DBA takes care of the security of the DBMS, managing the license keys, managing user accounts and access etc.

3. Explain Cartesian Product with a suitable example.

- Cross product is a way of combining two relations.
- The resulting relation contains, both relations being combined.
- This type of operation is helpful to merge columns from two relations.

Example: A x B means A times B, where the relation A and B have different attributes.

4. Explain Object Model with example.

- Object model stores the data in the form of objects, attributes and methods, classes and Inheritance.
- This model handles more complex applications, such as Geographic information System (GIS), scientific experiments, engineering design and manufacturing.

An **example** of the Object model is **Shape**, **Circle**, **Rectangle** and **Triangle** are all objects in this model.

- Circle has the attribute radius.
- Rectangle has the attributes length and breadth.
- Triangle has the attributes base and height.
- The objects Circle, Rectangle and Triangle **inherit** from the object Shape.

5. Write a note on different types of DBMS users.

- Database Administrators: Database Administrator or DBA is the one who manages the complete database management system.
- Application Programmers or Software Developers: This user group is involved in developing and designing the parts of DBMS.
- End User: End users are the one who store, retrieve, update and delete data.
- **Database designers:** They are responsible for identifying the data to be stored in the database for choosing appropriate structures to represent and store the data.

Answer the following questions: (5 Marks)

1. Explain the different types of data model.

i) Hierarchical Model:

• In Hierarchical model, data is represented as a simple tree like structure form. This model represents a one-to-many relationship ie parent-child relationship. This model is mainly used in IBM Main Frame computers.

ii) Relational Model:

- The Relational Database model was first proposed by E.F. Codd in 1970.
- The basic structure of data in relational model is tables (relations).
- All the information's related to a particular type is stored in rows of that table.

iii) Network Model:

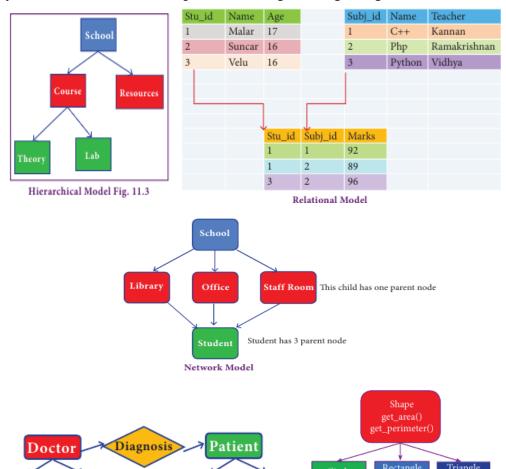
- In a Network model, a child may have many parent nodes.
- It represents the data in many-to-many relationships.
- This model is easier and faster to access the data.

iv) Entity Relationship Model. (ER model):

• In this database model, relationships are created by dividing the object into entity and its characteristics into attributes. It was developed by Chen in 1976.

v) Object Model:

- Object model stores the data in the form of objects, attributes and methods, classes and Inheritance.
- This model handles more complex applications, such as Geographic information System (GIS), scientific experiments, engineering design and manufacturing.



P-Name

Object Model

ER model

2. Explain the different types of relationship mapping. Types of Relationships:

1. One-to-One Relationship

2.One-to-Many Relationship

3.Many-to-One Relationship

4. Many-to-Many Relationship

• One-to-One Relationship: In One-to-One Relationship, one entity is related with only one other entity

For Example: A student can have only one exam number.

• One-to-Many Relationship: In One-to-Many relationship, one entity is related to many other entities.

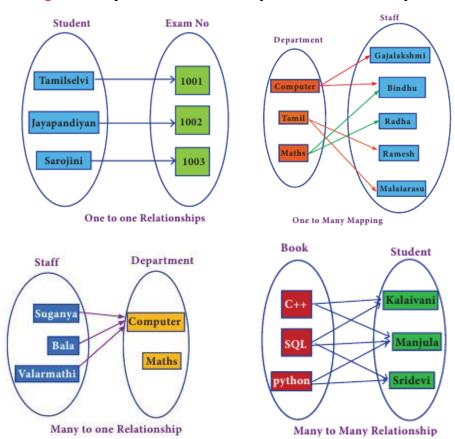
For Example: One Department has many staff members.

• Many-to-One Relationship: In Many-to-One Relationship, many entities can be related with only one in the other entity.

For Example: A number of staff members working in one Department

• Many-to-Many Relationship: A many-to-many relationship occurs when multiple records in a table are associated with multiple records in another table.

For Example: Many Books in a Library are issued to many students.



3. Differentiate DBMS and RDBMS.

Basis of Comparison	DBMS	RDBMS	
Expansion	Database Management System	Relational DataBase Management System	
Data storage	Navigational model (ie) data by linked records	Relational model (ie) data in tables as row and column	
Data redundancy	Present	Not Present	
Normalization	Not performed	RDBMS uses normalization to reduce redundancy	
Data access	Consumes more time	Faster, compared to DBMS.	
Keys and indexes	Does not use.	used to establish relationship. Keys are used in RDBMS.	
Transaction management	Inefficient, Error prone and insecure.	Efficient and secure.	
Distributed Databases	Not supported	Supported by RDBMS.	
Example	Dbase, FoxPro.	SQL server, Oracle, mysql, MariaDB, SQLite, MS Access.	

4. Explain the characteristics of RDBMS.

Ability to manipulate data	RDBMS provides the facility to manipulate data (store, modify and delete)in a data base.		
Reduced Redundancy	RDBMS follows Normalisation which divides the data in such a way that repetition is minimum.		
Data Consistency	On live data, it is being continuously updated and added, maintaining the consistency of data can become a challenge. But RDBMS handles it by itself.		
Support Multiple user and Concurrent Access	<u> </u>		
Query Language	RDBMS provides users with a simple query language, using which data can be easily fetched, inserted, deleted and updated in a database.		
Security	we can easily secure our data by restricting user access.		
DBMS Supports Transactions	It allows us to better handle and manage data integrity in real world applications.		

5. Explain the different operators in Relational algebra with suitable examples.

Relational Algebra:

(i) Union(Symbol: ∪) (ii) Intersection(Symbol: ∩)

(iii) Difference(Symbol: -) (iv) Cartesian Product(Symbol: X)

UNION (Symbol:∪) AUB

• It includes all tuples that are in tables A or in B. It also eliminates duplicates.

INTERSECTION (symbol: \cap) A \cap B

• Defines a relation consisting of a set of all tuple that are in both in A and B. However, A and B must be union-compatible.

DIFFERENCE (Symbol: -)

• The result of A - B, is a relation which includes all tuples that are in A but not in B. The attribute name of A has to match with the attribute name in B.

CARTESIAN PRODUCT (Symbol: X)

• Cross product is a way of combining two relations. The resulting relation contains, both relations being combined.

Example:

Tat	ole A	Та	ble B
Stuno	Name	Stuno	Name
Cs1	Kannan	Cs1	Kannan
Cs3	Lenin	Cs2	Shankar
Cs4	Raja	Cs3	Lenin

Table A ∪ B		
Stuno	Name	
Cs1	Kannan	
Cs2	Shankar	
Cs3	Lenin	
Cs4	Raja	

Table A ∩ B		
Stuno Name		
Cs1	Kannan	
Cs3	Lenin	

Table A — B		
Stuno Name		
Cs4	Raja	

Table A		
Stuno Name		
Cs1	Kannan	
Cs2	Shankar	

Table B		
Course	Subject	
Cs28	Big Data	
Cs62	R Language	

Table A × B			
Stuno	Name	Course	Subject
Cs1	Kannan	Cs28	Big Data
Cs1	Kannan	Cs62	R Language
Cs2	Shankar	Cs28	Big Data
Cs2	Shankar	Cs62	R Language

CHAPTER 12: Structured Query Language (SQL)

Choose the best answer: (1 Mark)

- 1. Which commands provide definitions for creating table structure, deleting relations, and modifying relation schemas.
 - (A) DDL (B) DML (C) DCL (D) DQL
- 2. Which command lets to change the structure of the table?(A) SELECT (B) ORDER BY (C) MODIFY (D) ALTER
- 3. The command to delete a table including the structure is
 - (A) DROP (B) DELETE (C) DELETE ALL D) ALTER TABLE
- 4. Queries can be generated using
 - (A) SELECT (B) ORDER BY (C) MODIFY (D) ALTER
- 5. The clause used to sort data in a database
 - (A) SORT BY (B) ORDER BY (C) GROUP BY (D) SELECT

Answer the following questions: (2 Marks)

- 1. Write a query that selects all students whose age is less than 18 in order wise. SELECT * FROM Student WHERE Age<=18 ORDER BY Name;
- 2. Differentiate Unique and Primary Key constraint.

Unique Key Constraint	Primary Key Constraint
This constraint ensures that no two	Primary constraint declares a field as a
rows have the same value in the	Primary key which helps to uniquely
specified columns.	identify a record.

3. Write the difference between table constraint and column constraint?

Table Constraint	Column Constraint		
Table constraints apply to a group of	Column constraints apply only to		
one or more columns	individual column.		

- 4. Which component of SQL lets insert values in tables and which lets to create a table?
 - DML: Insert Insert data into a table
 - DDL: Create To create tables in the database.
- 5. What is the difference between SQL and MySQL?

	SQ	L			MySQL
Structured	Query	Language	is	a	MySQL is a Relational database
language used for accessing databases.		management system.			

Answer the following questions: (3 Marks)

- 1. What is a constraint? Write short note on Primary key constraint.
 - Constraint is a condition applicable on a field or set of fields.
 - Primary constraint declares a field as a Primary key which helps to uniquely identify a record.
 - The primary key does not allow **NULL** values and therefore a primary key field must have the **NOT NULL** constraint.
- 2. Write a SQL statement to modify the student table structure by adding a new field.
 - To add a new column "Address" of type "char" to the Student table, the command is:

ALTER TABLE Student ADD Address char;

- 3. Write any three DDL commands.
 - Create: To create tables in the database.
 - Alter: Alters the structure of the database.
 - **Drop:** Delete tables from database.
- 4. Write the use of Savepoint command with an example.
 - The **SAVEPOINT** command is used to temporarily save a transaction so that you can rollback to the point whenever required.

Syntax: SAVEPOINT savepoint_name;

Example: UPDATE student SET Name = 'Mini' WHERE Admno=105;

SAVEPOINT A;

5. Write a SQL statement using DISTINCT keyword.

• The **DISTINCT** keyword is used along with the **SELECT** command to eliminate duplicate rows in the table.

For Example: SELECT DISTINCT Place FROM Student;

Answer the following questions: (5 Marks)

1. Write the different types of constraints and their functions.

Constraint is a condition applicable on a field or set of fields.

Type of Constraints:

- **Unique Constraint:** This constraint ensures that no two rows have the same value in the specified columns.
- Primary Key Constraint: This constraint declares a field as a Primary key
 which helps to uniquely identify a record. The primary key does not allow
 NULL values and therefore a field declared as primary key must have the
 NOT NULL constraint.
- **Default constraint**: This constraint is used to assign a default value for the field. When no value is given for the specified field having **DEFAULT** constraint, automatically the default value will be assigned to the field.
- Check Constraint: This constraint helps to set a limit value placed for a field. When we define a check constraint on a single column, it allows only the restricted values on that field.
- **Table Constraint:** When the constraint is applied to a group of fields of the table, it is known as Table constraint. The table constraint is normally given at the end of the table definition.

2. Consider the following employee table. Write SQL commands for the qtns.(i) to (v).

EMP CODE	NAME	DESIG	PAY	ALLO WANCE
S1001	Hariharan	Supervisor	29000	12000
P1002	Shaji	Operator	10000	5500
P1003	Prasad	Operator	12000	6500
C1004	Manjima	Clerk	8000	4500
M1005	Ratheesh	Mechanic	20000	7000

- (i) To display the details of all employees in descending order of pay. SELECT * FROM employee ORDER BY DESC;
- (ii) To display all employees whose allowance is between 5000 and 7000.

 SELECT * FROM employee WHERE allowance BETWEEN 5000 AND 7000;
- (iii) To remove the employees who are mechanic.

 DELETE FROM employee WHERE desig="Mechanic";
- (iv) To add a new row.

 INSERT INTO employee (empcode, name, desig, pay, allowance)
 VALUES(\$1002,Baskaran,Supervisor,29000,12000);
- (v) To display the details of all employees who are operators.

 SELECT * FROM employee WHERE design="Operator";

3. What are the components of SQL? Write the commands in each Components of SQL:

DATA DEFINITION LANGUAGE (DDL):

- **Create:** To create tables in the database.
- Alter: Alters the structure of the database.
- **Drop:** Delete tables from database.
- **Truncate:** Remove all records from a table, also release the space occupied by those records.

DATA MANIPULATION LANGUAGE (DML):

- **Insert**: Inserts data into a table
- **Update:** Updates the existing data within a table.
- Delete: Deletes all records from a table, but not the space occupied by them.

DATA CONTROL LANGUAGE (DCL):

- Grant: Grants permission to one or more users to perform specific tasks.
- Revoke: Withdraws the access permission given by the GRANT statement.

TRANSACTIONAL CONTROL LANGUAGE (TCL):

- Commit: Saves any transaction into the database permanently.
- Roll back: Restores the database to last commit state.
- Save point: Temporarily save a transaction so that you can rollback.

DATA QUERY LANGUAGE (DOL):

- **Select:** It displays the records from the table.
- 4. Construct the following SQL statements in the student table-
 - (i) SELECT statement using GROUP BY clause.
 - (ii) SELECT statement using ORDER BY clause.
 - (i) SELECT statement using GROUP BY clause.

The **GROUP BY** clause is used with the **SELECT** statement to group the students on rows or columns having identical values or divide the table in to groups.

For example: The number of male students or female students of a class, the GROUP BY clause may be used. The command is,

SELECT Gender FROM Student GROUP BY Gender:

(ii) SELECT statement using ORDER BY clause.

The **ORDER BY** clause in SQL is used to sort the data in either ascending or descending based on one or more columns.

- By default **ORDER BY** sorts the data in ascending order.
- We can use the keyword **DESC** to sort the data in descending order and the keyword **ASC** to sort in ascending order.

For example: To display the students in alphabetical order of their names, the command is used as,

SELECT * FROM student WHERE Age>=18 ORDER BY Name DESC;

5. Write a SQL statement to create a table for employee having any five fields and create a table constraint for the employee table. SQL Statement:

```
CREATE TABLE employee
(empno integer NOT NULL,
name char(20),
desig char(20),
pay integer,
allowance integer,
PRIMARY KEY (empno));
```

CHAPTER 13: Python and CSV files

Choose the best answer: (1 Mark) 1. A CSV file is also known as a (B) 3D File (C) String File (D) Random File (A) Flat File 2. The expansion of CRLF is (A) Control Return and Line Feed (B) Carriage Return and Form Feed (C) Control Router and Line Feed (D) Carriage Return and Line Feed 3. Which of the following module is provided by Python to do several operations on the CSV files? (A) py (B) xls (C) csv (D) os 4. Which of the following mode is used when dealing with non-text files like image or exe files? (A) Text mode (B) Binary mode (C) xls mode (D) csv mode 5 5. The command used to skip a row in a CSV file is (A) next() (B) skip() (C) omit() (D) bounce() 6. Which of the following is a string used to terminate lines produced by writer()method of csymodule? (A) Line Terminator (B) Enter key (C) Form feed (D) DataTerminator 7. What is the output of the following program? import csv d=csv.reader(open('c:\PYPRG\ch13\city.csv')) next(d) for row in d: print(row) if the file called "city.csv" contain the following details chennai, mylapore mumbai, andheri (A) chennai, mylapore (B) mumbai, and heri (C) Chennai (D) chennai, mylapore Mumbai mumbai, and heri 8. Which of the following creates an object which maps data to a dictionary? (A) listreader() (B) reader() (C) tuplereader() (D) DictReader () 9. Making some changes in the data of the existing file or adding more data is called (A) Editing (B) Appending (C) Modification (D) Alteration 10. What will be written inside the file test.csv using the following program. Import csv D=[['Exam'],['Quarterly'],['Halfyearly']] Csv.register dialect('M',lineterminator='\n') Wr=csv.writer(f,dialect='M') Wr.writerows(D) f.close() (A) Exam Quarterly Halfyearly (B) Exam Quarterly Halfyearly (C) E (D) Exam, Q Quarterly, Η **Halfyearly**

Answer the following questions: (2 Marks)

- 1. What is CSV File?
 - A CSV file is a human readable text file where each line has a number of fields, separated by commas or some other delimiter.
- 2. Mention the two ways to read a CSV file using Python.

The two ways to read a CSV file are:

- using csv.reader() function
 - * using DictReader class.
- 3. Mention the default modes of the File.
 - The default is reading ('r') in text mode.
 - In this mode, while reading from the file the data would be in the format of strings.
- 4. What is use of next() function?
 - 'next()' command is used to avoid or skip the first row or row heading.

Example: While sorting the row heading is also get sorted, to avoid that the first is skipped using next().

- 5. How will you sort more than one column from a csv file? Give an example statement.
 - To sort by more than one column you can use **itemgetter** with multiple indices.

Syntax:

```
sortedlist = sorted(data, key=operator.itemgetter(Col_number),reverse=True)
```

Example: sortedlist = sorted (data, key=operator.itemgetter(1))

Answer the following questions: (3 Marks)

- 1. Write a note on open() function of python. What is the difference between the two methods?
 - Python has a built-in function **open**() to open a file.
 - This function is used to read or modify the file accordingly.

```
Method 1: f = open("test.txt") f.close()
```

Method 2: with open("test.txt",'r') as f:

- The first method is **not entirely safe.** If an **exception** occurs when you are performing some operation with the file, the code exits without closing the file.
- The best way to do this is using the "with" statement. This ensures that the file is closed when the block inside with is exited
- 2. Write a Python program to modify an existing file. Coding:

```
import csv
row = ['3', 'Meena', 'Bangalore']
with open('student.csv', 'r') as readFile:
    reader = csv.reader(readFile)
    lines = list(reader)
    lines[3] = row
with open('student.csv', 'w') as writeFile:
    writer = csv.writer(writeFile)
    writer.writerows(lines)
readFile.close()
writeFile.close()
```

3. Write a Python program to read a CSV file with default delimiter comma (,).

Coding:

```
import csv
with open('c:\pyprg\sample1.csv','r') as F:
   reader = csv.reader(F)
   for row in reader:
        print(row)
F.close()
```

4. What is the difference between the write mode and append mode.

w - Write Mode	a - Append Mode
Open a file for writing.	Open for appending at the end of the
	file without truncating it.
Creates a new file if it does not exist	Creates a new file if it does not exist.
or truncates the file if it exists.	

5. What is the difference between reader()method and DictReader() class?

Reader():	DictReader():
The reader function is designed to	DictReader function creates an object
take each line of the file and make a	which maps data to a dictionary. It
list of all columns.	works by reading the first line of the
	CSV and using each comma separated
	value in this line as a dictionary key.
csv. Reader work with list/tuple.	csv.DictReader work with dictionary.

Answer the following questions: (5 Marks)

1. Differentiate Excel file and CSV file.

Excel	CSV	
Excel is a binary file that holds	CSV format is a plain text format with a	
information about all the worksheets in a	series of values separated by commas.	
file, including both content and		
formatting		
XLS files can only be read by	CSV can be opened with any text editor	
applications that have been especially	in Windows like notepad, MS Excel,	
written to read their format.	OpenOffice, etc.	
Excel file saves the file in .xls or .xlsx	Saves the file with the extension .csv	
format.		
Excel consumes more memory while	Importing CSV files can be much faster,	
importing data	and it also consumes less memory	

2. Tabulate the different mode with its meaning.

Mode	Description
'r'	Open a file for reading. (default)
'w'	Open a file for writing. Creates a new file if it does not exist or truncates the file if it exists.
'x'	Open a file for exclusive creation. If the file already exists, the operation fails.
'a'	Open for appending at the end of the file without truncating it. Creates a new file if it does not exist.
't'	Open in text mode. (default)
'b'	Open in binary mode.
'+'	Open a file for updating (reading and writing)

3. Write the different methods to read a File in Python. csv.reader() function:

- Contents of CSV file can be read with the help of **csv.reader()** method.
- The reader function is designed to take each line of the file and make a list of all columns.

Syntax: csv.reader(fileobject,delimiter,fmtparams) where

• file object : passes the path and the mode of the file

• delimiter: an optional parameter containing the standard dialects. optional parameter which help to override the default fmtparams:

values of the dialects.

Example: import csv

with open('c:\\pyprg\\sample1.csv', 'r') as F:

reader = csv.reader(F)for row in reader: print(row)

F.close()

Output: ['SNO', 'NAME', 'CITY']

> ['12101', 'RAM', 'CHENNAI'] ['12102', 'LAVANYA', 'TIRUCHY'] ['12103', 'LAKSHMAN', 'MADURAI']

DictReader class:

- It creates an object which maps data to a dictionary.
- **DictReader** works by reading the first line of the CSV and using each comma separated value in this line as a dictionary key.

```
Example:
                 import csv
                 filename = 'c:\\pyprg\\sample8.csv'
                 input file =csv.DictReader(open(filename, 'r'))
                 for row in input_file:
                        print(dict(row))
           {'ItemName ': 'Keyboard ', 'Quantity': '48'}
Output:
           {'ItemName ': 'Monitor', 'Quantity': '52'}
           {'ItemName ': 'Mouse ', 'Quantity': '20'}
```

4. Write a Python program to write a CSV File with custom quotes.

Coding:

5. Write the rules to be followed to format the data in a CSV file. Rules to be followed to format data in a CSV file

- Each row of data is to be located on a separate line, delimited by a line break by pressing enter key.
- The last record in the file may or may not have an ending line break.
- There may be an optional header line appearing as the first line of the file
- Within the header and each record, there may be one or more fields, separated by commas.
- Each field may or may not be enclosed in double quotes.
- Fields containing line breaks, double quotes, and commas should be enclosed in double-quotes.
- If double-quotes are used to enclose fields, then a double-quote appearing inside a field must be preceded with another double quote.

The Beautiful Thing

About Learning Is That

No One Can Take It Away

From You.

ALL THE BEST!



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