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| No. | Title | Points to be covered / example | Length |
| 1 | Introduction to data types. | Note: Welcome to the session on Introduction to data types which is basic but very important topic to design databases.  What we going to cover in this session/ In this session we are going to cover/  Today’s topic are / Today we are going to discuss/.  Categories of datatype Numeric, string, binary  Discussion on numeric data types (int, smallint, etc) including their ranges.  Difference between dec and float.  Discussion on String datatype (char, varchar, text, etc) non Unicode  Diff between char and varchar  Discussion on nvarchar/ Unicode  Diff between varchar and nvarchar (2)  Discussion on BLOB (full form to be told) – small, bigblob, etc.  Tell them the simillraty between blob and string.  CHAR, VARCHAR, TINYINT, INT, YEAR, DATE, BOOLEAN  Char(10)  Varchar(10)  e.g. todo  e.g.  DECIMAL(7, 2) Total length of this data type is 7 of which 2 will be decimal part.  5396.17 ok value  5396.174 5396.17  5396.178 5396.18  5396.1743 5396.17  5396.1748 5396.17  5396.1788 5396.18  Note: With this we have covered all the today’s topics.  I hope you understood data types in SQL. | 15 |
| 2(P1) | SQL Commands | Note: Welcome back to the session on SQL Commands.  What are SQL commands   1. DDL – Data Definition Language 2. DML – Data Manipulation Language 3. DCL – Data Control Language 4. TCL – Transaction Control Language 5. Constraints   DDL – Discuss – Full list of commands with brief description  e.g. of DDL  **CREATE** TABLE student (  ID INT,  firstName VARCHAR(45),  lastName VARCHAR(45),  DoB DATE  );  **ALTER** TABLE student ADD COLUMN emailID VARCHAR(145);  **DROP** TABLE student;  DML– Discuss – Full list of commands with brief description  e.g. of DML  **INSERT** INTO student VALUES (1, 'raju', 'patel', '1970-12-10', 'raju123@gmail.com');  **SELECT** \* FROM student;  **UPDATE** student SET emailID = 'mohan.desai@gmail.com' WHERE ID = 3;  **DELETE** FROM student WHERE ID = 3;  DCL– Discuss – Full list of commands with brief description  **GRANT and REVOKE**  TCL– Discuss – Full list of commands with brief description  **COMMIT and ROLLBACK**  Discussion on types Of Constraints (in brief)   * **NOT NULL** - Ensures that a column cannot have a NULL value * **UNIQUE** - Ensures that all values in a column are different * **PRIMARY KEY** - A combination of a NOT NULL and UNIQUE. Uniquely identifies each row in a table * **FOREIGN KEY** - Uniquely identifies a row/record in another table. * **CHECK** - Ensures that all values in a column satisfy a specific condition. | 20 |
| 3(P1) | Database management system | Intro to this course (Ulka and saleel - before recording discuss with sir)  Pre req. – For whom this course imp (eg. Application dev, DBA’s, Data Mining  Career imp - to become DBA, Data Sciten, etc.  Why this course is easy to learn (Section of course, number of sessions, total duration course duration 30hrs.)  Examples been covered. (number of databases, tables discuses)  Note: To be record at the last, content continually updated. | 5 |
| 4(P3) | Introduction to RDBMS | TODO: | 8 |
| 5(P3) | File System vs DBMS | Concepts of Flat Files  Concepts of DBMS  Advantage of File-oriented system  Backup, Data retrieval, Editing, Remoteaccess, Sharing  Disadvantage of File-oriented system  Data redundancy, Datainconsistency, Limiteddatasharing, Datasecurity  Advantage of DBMS  Improveddatasharing, Improveddatasecurity, Minimizeddatainconsistency, Minimized dataredundancy  Disadvantage of DBMS   * Cost of Hardware and Software of a DBMS is quite high * Most database management systems are often complex systems, so the training for users to use the DBMS is required. * All data is integrated into a single database which can be damaged because of electric failure or database is corrupted on the storage device.   Slides with graphics explaining the above concepts (good explanatory images)  Note: Content continually updated. | 5 |
| 6(P1) | Schema in databases | Intro to schema  Defining and creating schema  Managing and moving objects between schemas  Note: Slides required, live examples/demos ( Create Schema/database in MySQL is same, Use schema, moving objects (in MS-SQL possible)from one schema to another schema) | 10 |
| 7(P1) | DDL Commands | Disc on CREATE, ALTER, DROP  Disc this commands with ref to tables |  |
| 8(P1) | Candidate and Primary key | What is a candidate key  What is a primary key  Diff between CK and PK  Points to consider to make column PK and CK | 10 |
| 9(P1) | Primary Key | Imp of PK  Examples of PK  PK data type mostly it must be INT(eg ID), (Eg email varchar PK)  PK and AUTO\_INCREMENT  NOT NULL  Using multiple columns as PK (Composite Key)  Note: With Slides and Examples (student Table R= {ID, firstName, lastName, DoB, emailID } ) | 15 |
| 10(P1) | Foreign Key | Concepts of FK  Examples of FK  Data type of PK/FK must be same  Note: With Slides and Examples (student Table R= {ID(PK), firstName, lastName, DoB, emailID } , student\_address Table, student\_hobbies table}) – insert 4-5 demo records  Structure view and Brows view  URL: <https://dev.mysql.com/doc/workbench/en/wb-creating-eer-diagram.html> |  |
| 11(P1) | Introduction to DML commands | Use of INSERT, SELECT, UPDATE, DELETE and TRUNCATE with single table (student table)  Use of above commands with related tables (PK/FK table – student - student\_address)  Referential integrity (Directly adding a record in student\_address, deleting a student record,  Similar for student\_hobbies table)  Note: With Slides and Examples (student Table R= {ID(PK), firstName, lastName, DoB, emailID } , student\_address Table, student\_hobbies table})  Structure view and Brows view | 20 |
| 12(P2) | Working with ER models | What are ER models  Working with MySQL ER model Tool.  Benefits of documentation  Third party ER database documentations tools (toad from DELL, NaviCat)  Note: With Slides and Examples | 5-10 |
| 13(P3) | Using ER model for Project Documentations | Attributes of ER models  TODO |  |
| 14(P1) | Introduction to Relationships | Basic intro to all relationships  Note: With Slides with relationship definition and ER images | 5 |
| 15(P1) | One-to-one Relationship | Discussion of one-to-one relationships  Design intents for creating one-to-one relationships (situations like student\_address, one more example to be added)  How to create one-to-one relationship (T1-PK/T2-PK&FK)  Note: With Slides and Examples | 10 |
| 16(P1) | One-to-many Relationship | Discussion of one-to-many relationships  Design intents for creating one-to-many relationships (situations like student\_hobbies, one more example of **invoice** and **invoice\_items**) (Every one invoice must have at least one item))  How to create one-to-many relationship  Note: With Slides and Examples | 10 |
| 17(P1) | Many-to-many Relationship | Discussion of many-to-many relationships  Design intents for creating many-to-many relationships (situations like student, course, and course\_student)  How to create many-to-many relationship  Note: With Slides and Examples | 10 |
| 18(P4) | Many-to-many Relationship - 2 | Solving advance problem statements | TODO |
| 19(P2) | Introduction to Normalization | Concepts of Normalization  Reasons to normalize the database.  Brief on all normalization levels  Note: With Slides-good graphics | 10 |
| 20(P2) | Normalization | Insertion, Updating, and Deletion Anomaly  Note: With Slides and example | 5-10 |
| 21(P2) | First form of Normalization | Def of first form of normalization (1NF)  Understanding of closure of functional dependency  Understanding functional dependency and its properties.  Note: With Slides-good graphics and example | 10 |
| 22(P2) | Functional Dependency | Disc on Function Dependency  Closure of FD  Properties of FD  Note: With Slides-good graphics and example |  |
| 23(P2) | Second Normalization | Dis on 2NF  Note: With Slides-good graphics and example |  |
| 24(P2) | Third Normalization Form | Dis on 3NF  Problem statement for 3NF. (on Faculty/Room/Timing)  Note: With Slides-good graphics and example |  |
| 25(P4) | Boyce Codd Normalization | Dis on BCNF |  |
| 26(P4) | Fifth Normalization Form | Dis on 5thNF  Loss less and loose decomposition  Minimal coverage  Note: With Slides-good graphics and example |  |
| 27(P2) | FAQ on Normalization | Recap on Normalization (1, 2 and 3NF)  15 Interview Que and Ans on Normalization.    Note: With Slides-good graphics and example |  |
| 28(P1) | Introduction to Joins | Dis on JOINS  Need for Joins  Types of Joins  Note: With Slides-good graphics and example | 10 |
| 29(P1) | Inner/ equi Joins | Dis on Inner/equi Joins  Dis on syntax  Situations to use Inner Joins.  Select appropriate tables (Student, student\_address)  Diff between Inner/equi and Natural join  Note: With Slides-good graphics and example | 10 |
| 30(P1) | Natural Join | Dis on Natural Join (Create new tables for Natural Join) keep the tables ready.  Diff between Natural join and Inner/equi Join.  Note: With Slides-good graphics and example | 5 |
| 31(P1) | Self Join | Dis on Self Join  Note: With Slides-good graphics and example |  |
| 32(P1) | Left Outer Join | Dis on Left Outer Join  Examples Student/CourseFees/Library  Note: With Slides-good graphics and example |  |
| 33(P1) | Right Outer Join | Dis on Right Outer Join  Examples Student/CourseFees/Library  Note: With Slides-good graphics and example |  |
| 34(P1) | Cross Join / Cartesian Join | Dic on Cross Join and Cartesian join    E.g. multi location chain of shops and their product inventory.  URL: <https://www.sqlservertutorial.net/sql-server-basics/sql-server-cross-join/>  Note: With Slides-good graphics and example |  |
| 35(P1) | UNION | Definition of UNION and UNION ALL  E.g. of union with diagram  URL: <https://www.sqlshack.com/sql-union-overview-usage-and-examples/#:~:text=The%20Union%20operator%20combines%20the,has%203%2C4%2C5.>  Note: With Slides-good graphics and example |  |
| 36(P1) | Difference between Delete and Truncate | What DELETE does  What truncate does  When to use delete and truncate with e.g. and demo.  Note: With Slides-good graphics and example | 5 |
| 37(P1) | Queries and Sub-queries | Dis on Queries (SELECT)  Disc on Sub-queries (What is a sub-query)  Why to use sub-queries.  E.g. of Using of sub-query  Note: With Slides-good graphics and example |  |
| 38(P1) | Queries and Nested Queries | Dis on nested Queries (SELECT)  Disc on nested queries (What is a nested query)  Why to use nested queries.  E.g. of Using of nested query  Note: With Slides-good graphics and example |  |
| 39(P1) | Queries and sub-queries using Group by clause | Dis on Group by (SELECT)  Disc on Group by)  Why to use group by clause.  E.g. of Using of group by  Note: With Slides-good graphics and example |  |
| 40(P1) | Having | Dis on Having (SELECT)  Disc on Having )  Why to use having clause.  E.g. of Using of having clause  Note: With Slides-good graphics and example |  |
| 41(P1) | Queries and sub-queries using in and not in clause | Dis on in and not in clause (SELECT)  Disc on in and not in clause)  Why to use in and not in clause.  E.g. of Using of in and not in clause  Note: With Slides-good graphics and example |  |
| 42(P1) | Queries and sub-queries using exists and not exists | Dis on exists and not exists clause (SELECT)  Disc on exists and not exists clause)  Why to use exists and not exists clause.  E.g. of Using of exists and not exists in clause  Note: With Slides-good graphics and example |  |
| 43(P1) | Aggregate Functions | Dis on SUM, AVG, COUNT , MIN, MAX  2-3 e.g. of each  Live DEMO;  Note: With Slides-good graphics and example |  |
| 44(P1) | Introduction to PL/SQL | Dis on PL/SQL  Note: With Slides-good graphics and example |  |
| 45(P1) | Using stored procedure | Need for SP  How to create Stored Procedure  Namening conventions of SP.  IN, OUT, and INOUT parameters  Note: With Slides-good graphics and example |  |
| 46(P1) | Using Functions | Need for Functions  How to create Functions  Namening conventions of Functions.  Note: With Slides-good graphics and example |  |
| 47(P1) | Using Triggers | Need for Triggers  How to create Triggers  Namening conventions of Triggers.  Note: With Slides-good graphics and example |  |
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