DBMS: Database Languages

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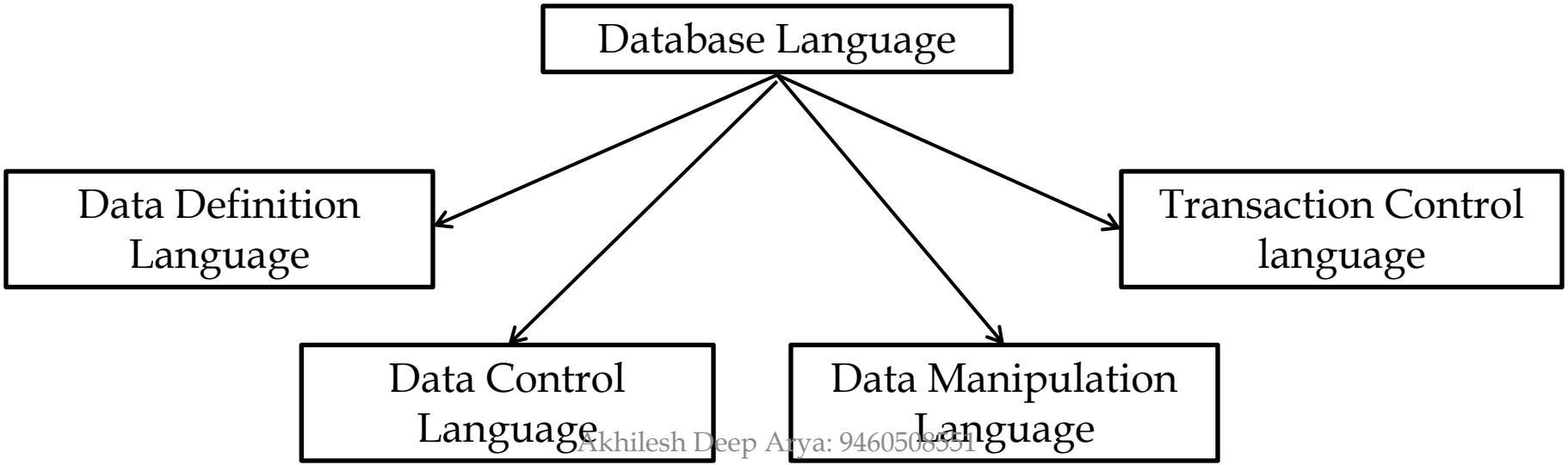
Database Language

- Database languages are used to read, store and update the data in the database.
- Following are the different types of database languages:



Data Definition Language

- DDL is used to define database objects.
- It is used to create schema, tables, indexes, constraints, etc. in the database.

Create:	It is used to create objects in the database.
Alter:	It is used to alter the structure of the database.
Drop:	It is used to delete objects from the database.
Truncate:	It is used to remove all records from a table.
Rename:	It is used to rename an object.

Data Control Language

- DCL statements control access to data and the database using statements such as GRANT and REVOKE.
- A privilege can either be granted to a User with the help of GRANT statement.
- Privilege can be canceled by using REVOKE command.

Grant:	It is used to give user access privileges to a database.
Revoke:	It is used to take back permissions from the user.

Data Manipulation Language

- A DML is a language that enables users to access or manipulate data stored in the database.
- Data manipulation involves retrieval of data from the database, insertion of new data into the database and deletion of data or modification of existing data.

Select:	It is used to retrieve data from a database.
Insert:	It is used to insert data into a table.
Update:	It is used to update existing data within a table.
Delete:	It is used to delete all records from a table.

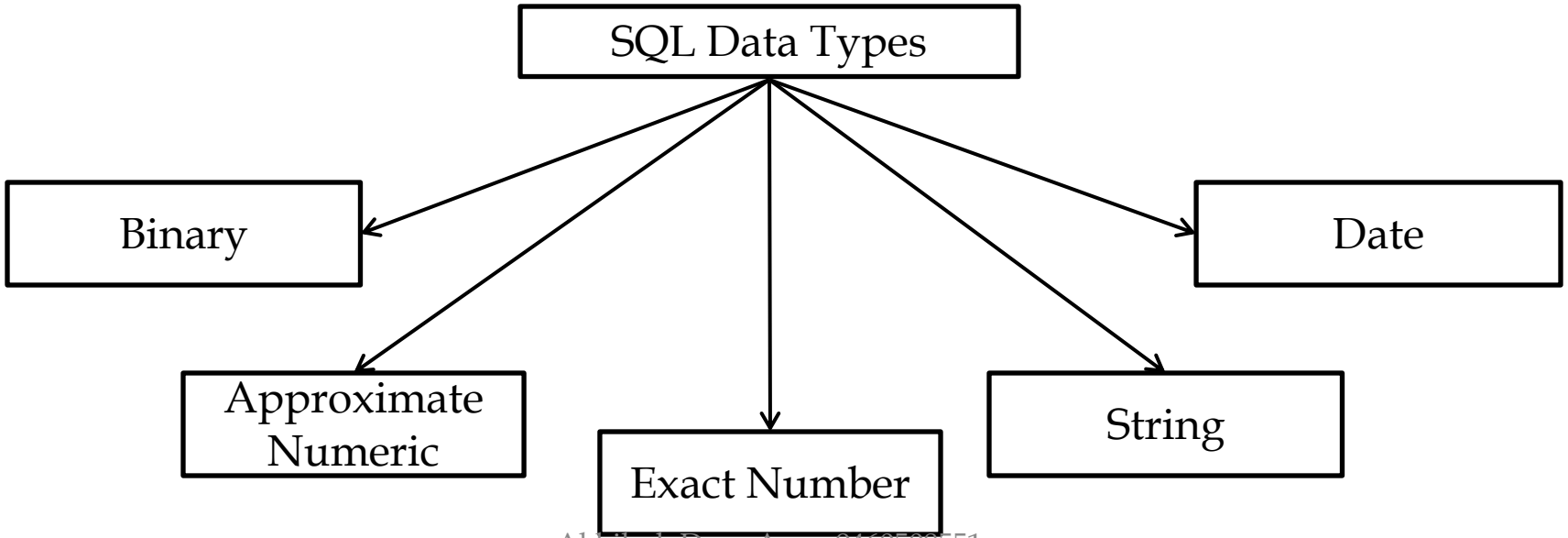
Transaction Control Language

- TCL is used to run the changes made by the DML statement. TCL can be grouped into a logical transaction.

Commit:	It is used to save the transaction on the database.
Rollback:	It is used to restore the database to original since the last Commit.

SQL Data Types

- A data type specifies size range and nature of data field in database.



Binary

- There are Three types of binary Data types which are given below

Data Type	Description
binary	It has a maximum length of 8000 bytes. It contains fixed-length binary data.
varbinary	It has a maximum length of 8000 bytes. It contains variable-length binary data.
image	It has a maximum length of 2,147,483,647 bytes. It contains variable-length binary data.

Approximate Numeric

Data type	From	To	Description
Float	-1.79E + 308	1.79E + 308	It is used to specify a floating-point value e.g. 6.2, 2.9 etc.
Real	-3.40e + 38	3.40E + 38	It specifies a single precision floating point number

Exact Numeric

Data type	To	From	Description
int	-2147483648	2147483647	It is used to specify an integer value.
smallint	-32768	32767	It is used to specify small integer value.
bit (size)	1	64	It has the number of bits to store.
decimal (size, d)	The maximum number for **size** is 65. The maximum number for **d** is 30. The default value for **size** is 10. The default value for **d** is 0.		

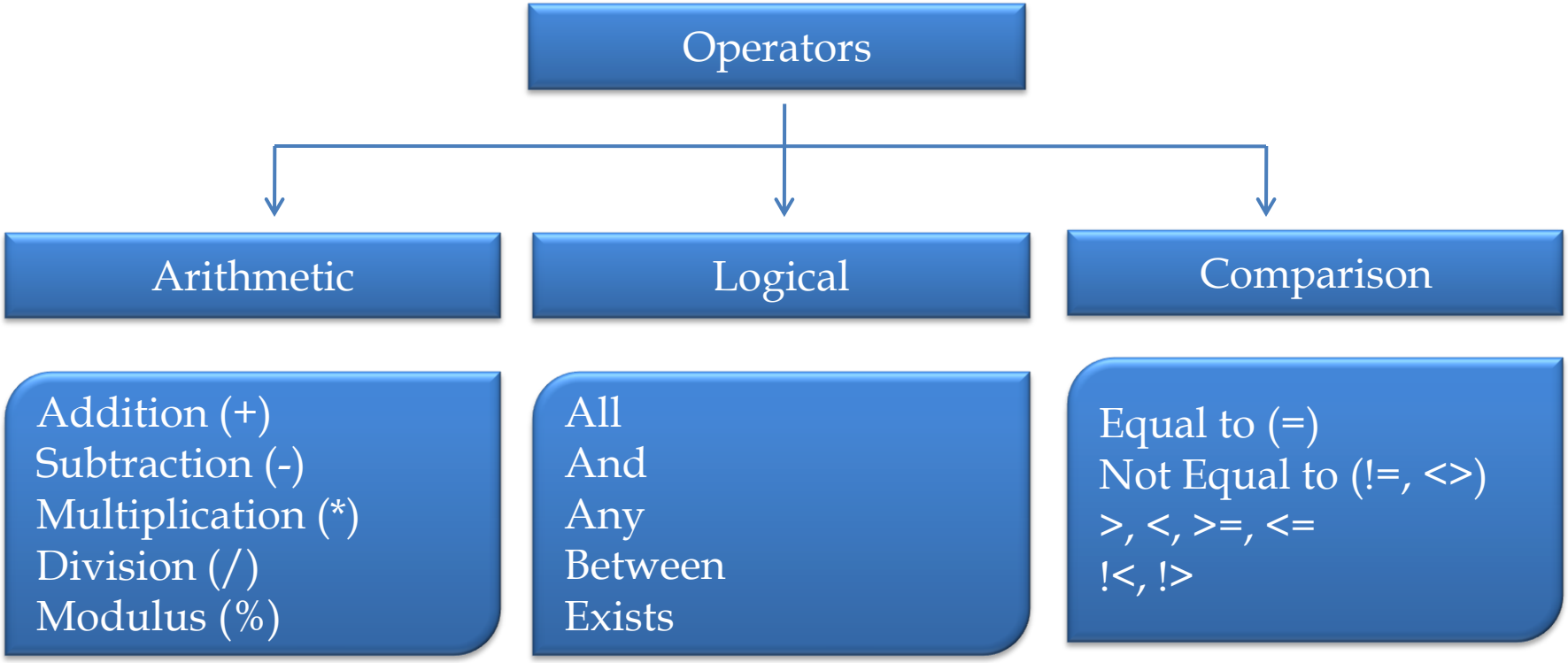
String

Data type	Description
char	It has a maximum length of 8000 characters. It contains Fixed-length non-unicode characters.
varchar	It has a maximum length of 8000 characters. It contains variable-length non-unicode characters.
text	It has a maximum length of 2,147,483,647 characters. It contains variable-length non-unicode characters.

Date and Time

Data-type	Description
date	Format: YYYY-MM-DD. The supported range is from '1000-01-01' to '9999-12-31'
time	It is used to store the hour, minute, and second values. Format: hh:mm:ss.
timestamp	It stores the year, month, day, hour, minute, and the second value. Format: YYYY-MM-DD hh:mm:ss.

SQL Operators



Install MySQL

Step-1: https://www.mysql.com/downloads/
Step-2: Select ***MySQL Community (GPL)*** Downloads
Step-3: Select ***MySQl installer*** for windows to download
Step-4: Click the installer select ***custom select***
Step-5: Select ***MySQL server*** latest edition
Step-6: Select ***MySQL workbench*** latest edition
Step-7: Select ***MySQL Shell*** latest edition
Step-8: Select password for your Root user in Account and Roles
Step-9: Click finish and ***TA-DA***

MySQL Workbench

Step-1: Connect SQL Server

A: Open Command Prompt

B: Select the path of the SQL server bin

C: Type ***cd path of SQL server*** and press enter

D: Type the command ***mysql –u root -p***

E: Enter the root password

Step-2: Start ***MySQL workbench***

Step-3: Click on ***Local instance MySQL80***

Step-4: Enter the same password of the root

And we are ready to type run our first SQL query

SQL STATEMENTS

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Data Definition Language

- Create Table

```
CREATE TABLE EMPLOYEE (
EMPID INT                          NOT NULL,
EMP_NAME VARCHAR (25)              NOT NULL,
AGE INT                            NOT NULL,
ADDRESS CHAR (30),
SALARY INT                         NOT NULL,
PRIMARY KEY (EMPID)
);
```

Cont..

- DESC **EMPLOYEE**;

Field	Type	Null	Key	Default
EMPID	int(11)	NO	PRI	NULL
EMP_NAME	varchar(25)	NO		NULL
AGE	int(11)			NULL
ADDRESS	Char (30)			NULL
SALARY	INT(11)	NO		NULL

Cont..

- Alter Table

➢ **ALTER TABLE EMPLOYEE**
ADD EMAIL CHAR(255) NOT NULL;

➢ **ALTER TABLE EMPLOYEE**
DROP COLUMN ADDRESS;

Cont..

- DESC **EMPLOYEE**;

Field	Type	Null	Key	Default
EMPID	int(11)	NO	PRI	NULL
EMP_NAME	varchar(25)	NO		NULL
AGE	int(11)			NULL
SALARY	INT(11)	NO		NULL
EMAIL	char(30)	NO		NULL

Cont..

- DROP **EMPLOYEE**;
  - The whole structure of the table including the data gets deleted when we use drop table.

Cont..

- Create Table

```
CREATE TABLE EMPLOYEE (
EMPID INT                       NOT NULL,
EMP_NAME VARCHAR (25)           NOT NULL,
AGE INT                         NOT NULL,
ADDRESS CHAR (30),
SALARY INT                      NOT NULL,
PRIMARY KEY (ID)
);
```

Cont..

Suppose EMPLOYEE table have following entries in it.

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	JOHN	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
103	SANKET	25	BANGLORE	45000
104	KHUSHI	29	GANDHINAGAR	40000
105	SHUBH	30	AJMER	30000
106	JONATHAN	25	PUNE	34000

Cont..

- RENAME **EMPLOYEE** TO **EMP**;
- SELECT *FROM **EMP**;

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	JOHN	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
103	SANKET	25	BANGLORE	45000
104	KHUSHI	29	GANDHINAGAR	40000
105	SHUBH	30	AJMER	30000
106	JONATHAN	25	PUNE	34000

Cont..

- DELETE FROM **EMP** WHERE EMPID=104;
- SELECT * FROM **EMP**;

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	JOHN	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
103	SANKET	25	BANGLORE	45000
105	SHUBH	30	AJMER	30000
106	JONATHAN	25	PUNE	34000

Data Manipulation Language

- Delete Command

➢ DELETE **EMPLOYEE;**

  - In this case all the entries from the table employee gets deleted but structure remains unchanged
  - You can enter new values in it using the insert command

Cont..

- Insert Command

➢ INSERT INTO **EMPLOYEE** VALUES (101, “JOHN”, 31, “JAIPUR”, 25000);

➢ INSERT INTO **EMPLOYEE** VALUES (102, “ANDREW”, 33, “UDAIPUR”, 31000);

Make 4 more entries in the similar way

Cont..

- SELECT * FROM **EMPLOYEE;**

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	JOHN	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
103	SANKET	25	BANGLORE	45000
104	KHUSHI	29	GANDHINAGAR	40000
105	SHUBH	30	AJMER	30000
106	JONATHAN	25	PUNE	34000

Cont..

- UPDATE **EMPLOYEE** SET EMP_NAME = 'KSHITIZ' WHERE EMPID = 101;
- SELECT * FROM **EMPLOYEE**;

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	KSHITIZ	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
103	SANKET	25	BANGLORE	45000
104	KHUSHI	29	GANDHINAGAR	40000
105	SHUBH	30	AJMER	30000
106	JONATHAN	25	PUNE	34000

Commit vs. Rollback (TCL)

➢SELECT * FROM **EMPLOYEE**;

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	KSHITIZ	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
103	SANKET	25	BANGLORE	45000
104	KHUSHI	29	GANDHINAGAR	40000
105	SHUBH	30	AJMER	30000
106	JONATHAN	25	PUNE	34000

Employee Relation

Commit

- DELETE FROM **EMPLOYEE** WHERE AGE <= 25;
- COMMIT;
- SELECT * FROM **EMPLOYEE**;

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	KSHITIZ	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
104	KHUSHI	29	GANDHINAGAR	40000
105	SHUBH	30	AJMER	30000

Rollback

- DELETE FROM **EMPLOYEE** Where AGE = 30;
- SELECT * FROM **EMPLOYEE**;

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	KSHITIZ	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
104	KHUSHI	29	GANDHINAGAR	40000

Commit

- ROLLBACK;
- SELECT * FROM **EMPLOYEE**;

EMPID	EMP_NAME	AGE	ADDRESS	SALARY
101	KSHITIZ	31	JAIPUR	25000
102	ANDREW	33	UDAIPUR	31000
104	KHUSHI	29	GANDHINAGAR	40000
105	SHUBH	30	AJMER	30000