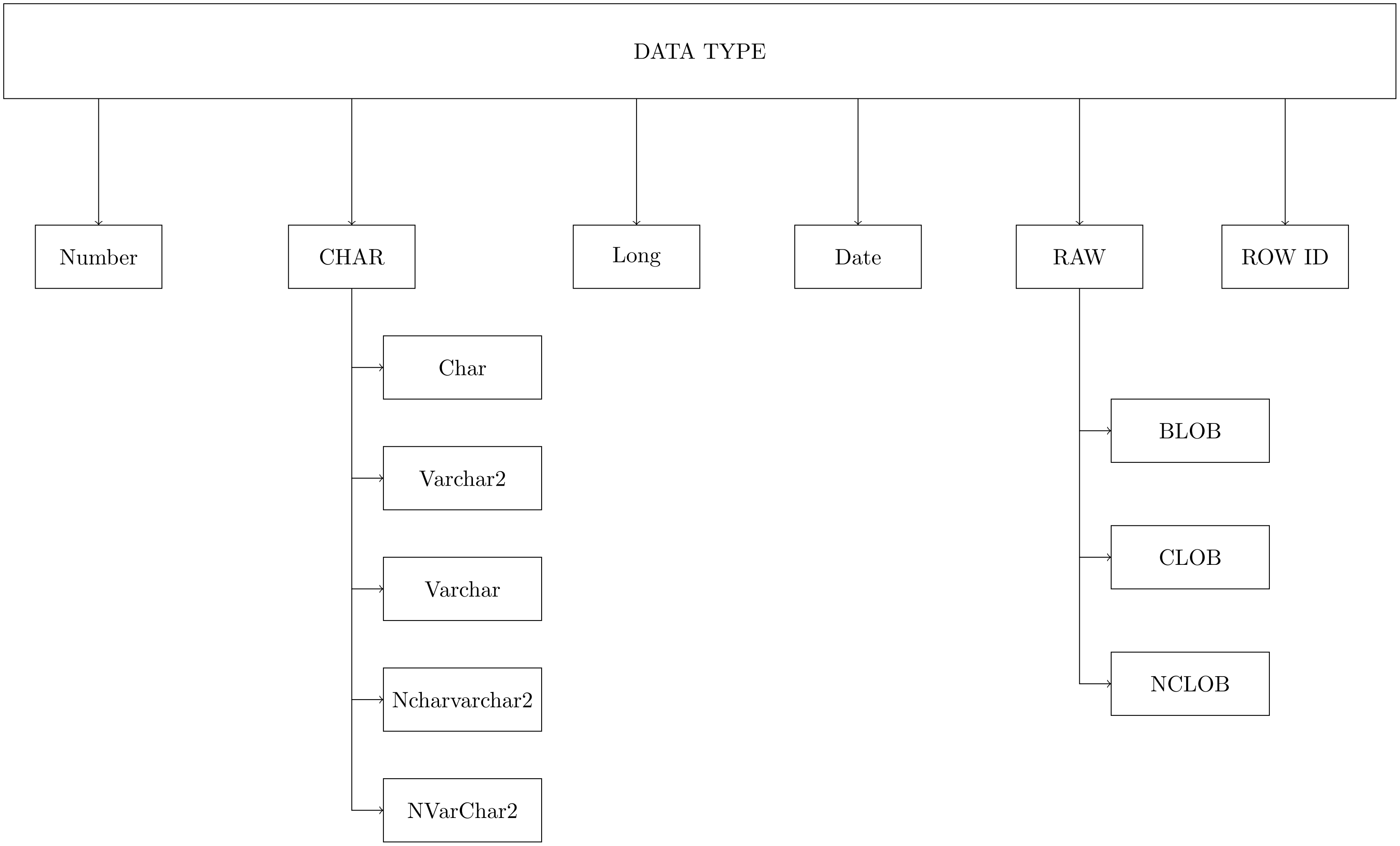
1 Data Types

- Number :
- Char :
  - Char
  - Varchar
  - Varchar2
  -
  -
- Date :
- Long :
- Raw :
  - Blob :
  - Clob :
  - Nclob :
- Row ID :



2 Classification Of SQL Statement

- DDL :
  - Create :
  - Alter :
  - Drop :
  - Truncate :
  - Rename :
- DRL/SQL :
- DML :
  - Insert :
  - Update :
  - Delete :

- DCL :
  - Grant :
  - Revoke :
- TCL :
  - Commit :
  - Rollback :
  - SavePoint :

3 DDL Commands

3.1 Create Table

Definition

To create a table in oracle sql we just have to give the table a name and define each column known as attribut by giving each of them a name , a dataType and an optional constraint that can be added in same line of attribut definition or on its own line , we will see contraint in details in the next section

Syntax :

Table Creation

create table <table_name>(
<attribute$_1$> <DataType$_1$> [Constraint$_1$],
<attribute$_2$> <DataType$_2$> [Constraint$_2$],
....
<attribute$_n$> <DataType$_n$> [Constraint$_n$],
[table contraints]
);

Example :

let's create student table

```
create table student (
id number,
firstname varchar2(50),
lastname varchar2(50),
grade number(2,2)
);
```

3.2 Table Constraints

Definition

Constraints are conditions set on the columns (attributes) of a table to ensure data integrity and consistency. Constraints can be defined:

- During table creation, either on the same line as the attribute definition or on a separate line
- After table creation using the ALTER TABLE command

There are two types of constraints: static and dynamic.

Static Constraints

Static constraints are fixed conditions that do not change based on data input.

- **NOT NULL**: Ensures that the attribute must have a value when inserting into the table.
- **UNIQUE**: Ensures that each value in the attribute is distinct. Unlike PRIMARY KEY, it allows null values.
- **PRIMARY KEY**: Combines UNIQUE and NOT NULL properties to ensure each value is unique and not null. Used to identify rows uniquely.
- **FOREIGN KEY**: References a primary key from another table to establish a relationship between tables.
- **DELETE ON CASCADE**: When deleting a row from the referenced (parent) table, all rows in the child table that contain the matching foreign key are also deleted.

Dynamic Constraints

Dynamic constraints apply conditions that can change based on specified criteria.

- **CHECK**: Validates a specified condition before allowing data to be inserted or updated.
- **DEFAULT**: Sets a default value for the attribute if no value is provided during insertion.

Syntax

Inline Constraint

<attribute$_i$> <DataType$_i$> not null
<attribute$_i$> <DataType$_i$> unique
<attribute$_i$> <DataType$_i$> primary key
<attribute$_i$> <DataType$_i$> references referenced_table(references_attribute)
<attribute$_i$> <DataType$_i$> default (value)

Outline Constraint

constraint <contraint_name> <attribute$_i$> not null
<attribute$_i$> not null

constraint <contraint_name> <attribute$_i$> unique
<attribute$_i$> unique

constraint <contraint_name> <attribute$_i$> primary key
primary key (attribute$_1$,..., attribute$_n$)

constraint <contraint_name> foreign key <attribute$_i$> references referenced_table(references_attribute)
foreign key <attribute$_i$> references referenced_table(references_attribute)

constraint <contraint_name> <attribute$_i$> default (value)
<attribute$_i$> default (value)

Example :

let's create a new table section and recreate the student table with constraints

Creating Section Table

Inline Method

```
    create table section (
    id_section number primary key,
    name varchar2(5) not null
    );
```

Outline Method

```
    create table section (
    id_section number,
    name varchar2(5),
    name not null,
    constraint pk_sec primary key (id_section)
    );
```

Create Student Table
Inline Method

```
    create table student (
    id number primary key,
    lastname varchar2(50) not null,
    firstname varchar2(50) not null,
    id_section number references section(id_section) on delete cascade,
    grade number(4,2) default 00.00 check (grade between 0 and 20),
    dob date not null check (dob<= add_months(sysdate,-18*12))
    );
```

Outline Mehtod

```
    create table student (
    id number,
    constraint pk_student primary key(id),
    lastname varchar2(50),
    firstname varchar2(50),
    constraint nn_student_lastname lastname not null,
    constraint nn_student_firstname firstname not null,
    id_section number,
    constraint fr_student foreign key (id_section) references section(id_section) on delete cascade,
    grade number(4,2),
    grade default 00.00,
    constraint chk_student_grade check (grade between 0 and 20),
    dob date not null,
    constraint chk_student_dob check (dob<= add_months(sysdate,-18*12))
    );
```

Note

Name Convention Of Constraint

- Primary Key : PK_<tableName>
- Foreign Key : FK_<tableName>
- Unique : UQ_<tableName>_<columnName>
- Check : CHK_<tableName>_<columnName>
- Default : DF_<tableName>_<columnName>
- Not Null : NN_<tableName>_<columnName>

Constraint Name Must Be Unique
Tables inside the same PDB (pluggable data base) can't share the same constraints name
Multiple Constraints
It is possible to define multiple constraints on a single attribute using the inline method. However, with the outline method, each constraint needs to be specified individually.

3.3 Delete Table

Definition

We can delete table using the drop command

3.3.1 Syntax

Table Deletion

drop table <tableName>;

3.3.2 Example

lets delete the section table we created

```
drop table section;
```

3.4 Rename Table

Definition

We can rename tables by using the rename command

Syntax

Renaming Table

rename <old_tableName>to <new_tableName>;

Example

```
rename section to mama;
```

3.5 Alter Table

Definition

The ‘ALTER‘ command is a versatile command that allows us to change various aspects of a table:

- Columns
  - **Renaming Column**: Rename the column.
  - **Modify Column**: Change the constraint and data type.
  - **Add Column**: Add a new column.
  - **Remove Column**: Remove a column.
- Constraints
  - **Add Constraint**: Add a new constraint.
  - **Remove Constraint**: Remove a constraint.
  - **Enable Constraint**: Enable an already existing constraint.
  - **Disable Constraint**: Disable an already existing constraint without deleting it.

Syntax

Columns Modification

Renaming Column
alter table <tableName>rename column <old_columnName>to <new_columnName>;
Modify Column
alter table <tableName>modify (columnName [new column definition & constraints]);
Add Column
alter table <tableName>add (columnName [column definition & constraints]);
Remove Column
alter table <tableName>drop column <columnName>;

Constraints

Rename Constraint
alter table <tableName>rename constraint <old_constraintName>to <new_constraintName>;
Add Constraint
alter table <tableName>add constraint <constraintName>[Constraint];
Remove Constraint
alter table <tableName>drop constraint <constraintName>;
Enable Constraint
alter table <tableName>enable constraint <constraintName>;
Disable Constraint
alter table <tableName>disable constraint <constraintName>;

Example

3.6 Truncate Table

Definition

To remove all rows from a table efficiently we use the truncate command

Syntax

Truncing Table

truncate table <tableName>;

Example

lets delete all records from student table

```
    truncate table student;
```