

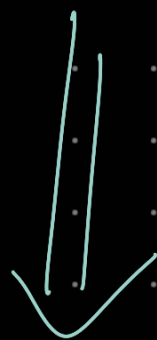
# [SQL]

(Structured Query Language)

\* SQL Query is just a string that is input to Database software  
String  $\xrightarrow[\text{to}]{\text{converts}}$  Actual computation on Data structure  $(B, B^+)$  tree.


$\Downarrow$   
physical data structure  
of table records.

How Query is converted to operation  
on physical data structure



Consider a simple SQL query:

sql

 Copy code

```
SELECT Name, Age FROM Employees WHERE Department = 'Sales';
```

- **Parsing:** The query is parsed to create a parse tree.
- **Validation:** The database checks that the `Employees` table and columns `Name`, `Age`, and `Department` exist and that the client has access rights.
- **Rewriting:** Any views or rules related to the `Employees` table are processed.
- **Optimization:** The optimizer determines whether to do a table scan or an index scan based on statistics.
- **Execution Plan:** The engine prepares a plan, e.g., `Index Scan on Employees`.
- **Execution:** The execution engine fetches data matching the `WHERE` condition and constructs the result set.
- **Return:** The result is sent back to the client.

