

Physical Database Design

Indexes Part I - Intro

ahmed khalifa

ahm7dkhalifa@gmail.com

+201002245404

<https://github.com/Ahm7dKhalifa>

What is index ?



```
graph TD; A[What is index ?] --- B[Data structure associated with a table or view to help database engine to retrieve data very fast]; A --- C[Type of data structure :]; C --- D[usually but not always the data structure is B-tree]; C --- E[the type of data structure is depend on some factors like : type of index , type of sql provider like : oracle , sql server or mysql ... and so on];
```

A mind map diagram with a central green box containing the text 'What is index ?'. Two orange lines branch out from the bottom of this box. The top branch leads to a blue box with the text 'Data structure associated with a table or view to help database engine to retrieve data very fast'. The bottom branch leads to another blue box with the text 'Type of data structure :'. From the bottom of this second box, two more orange lines branch out. The top one leads to a blue box with the text 'usually but not always the data structure is B-tree'. The bottom one leads to a larger blue box with the text 'the type of data structure is depend on some factors like : type of index , type of sql provider like : oracle , sql server or mysql ... and so on'.

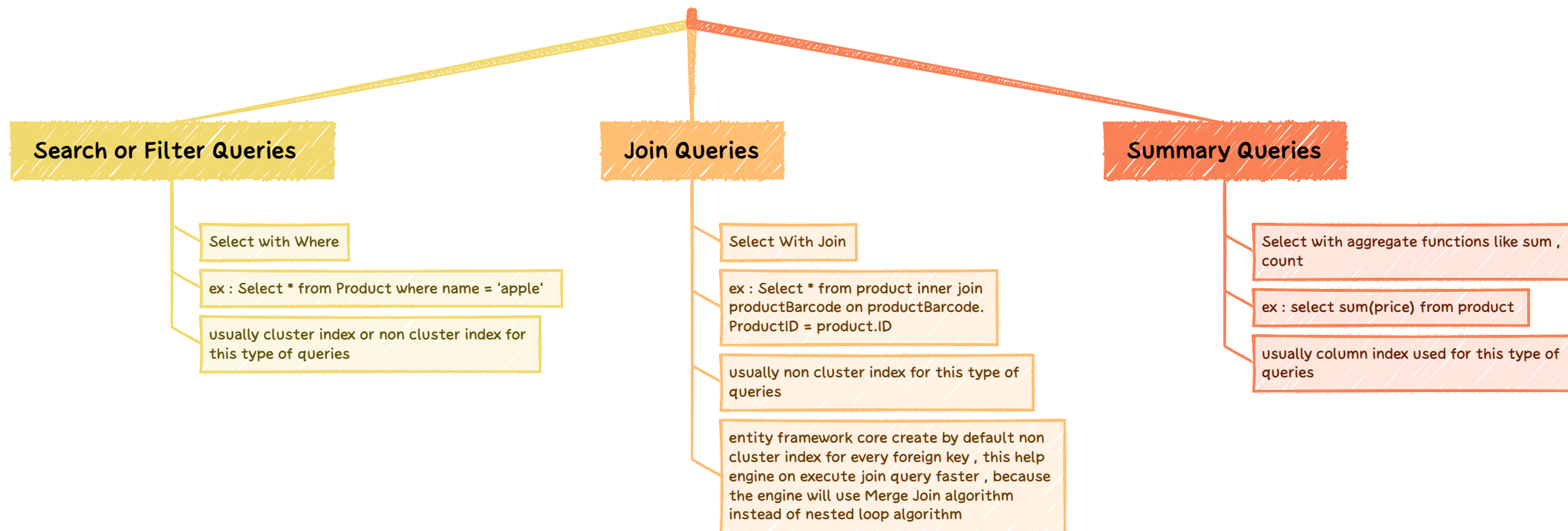
Data structure associated with a table or view to help database engine to retrieve data very fast

Type of data structure :

usually but not always the data structure is B-tree

the type of data structure is depend on some factors like : type of index , type of sql provider like : oracle , sql server or mysql ... and so on

Types Of SQL Queries That Can Use Indexes :



Advantages Of indexes :)



```
graph TD; A[Advantages Of indexes :)]; A --- B[Help database engine to retrieve data or execute select queries very fast with high performance]; A --- C[Help database engine to load minimum number of pages or rows from disk to memory]; A --- D[save database server memory or buffers space as possible];
```

Help database engine to retrieve data or execute select queries very fast with high performance

Help database engine to load minimum number of pages or rows from disk to memory

save database server memory or buffers space as possible

Disadvantages of indexes :(

```
graph LR; A[Disadvantages of indexes :(] --- B["indexes increase performance of read queries but when there a lot of indexes this will be decrease performance of write queries like : insert , update , delete."]; A --- C[indexes need extra space]; A --- D["the two previous problems can be solved if you design your index correctly and understand your business and needs"]
```

indexes increase performance of read queries but when there a lot of indexes this will be decrease performance of write queries like : insert , update , delete.

indexes need extra space

the two previous problems can be solved if you design your index correctly and understand your business and needs

Main Types Of indexes :

Clustered index

Non Clustered index

Column index

Filtered index

Hash index

Unique index