

# TABLE INDEXES

*Instructor:*



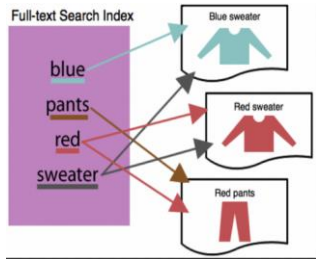
# Learning Goals

By the end of this lecture  
students should be able to:

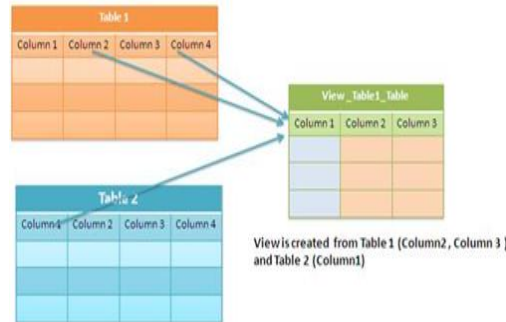
✓ Create Indexes to improve query retrieval speed

✓ Automatically generate sequence numbers by using a sequence generator

✓ Create, maintain, and use View

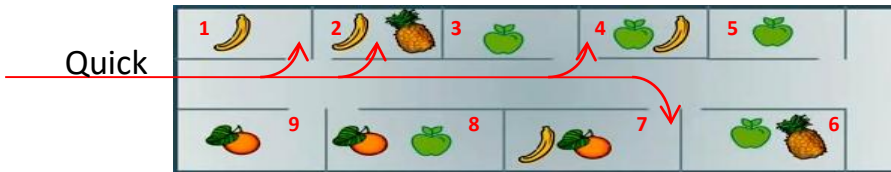
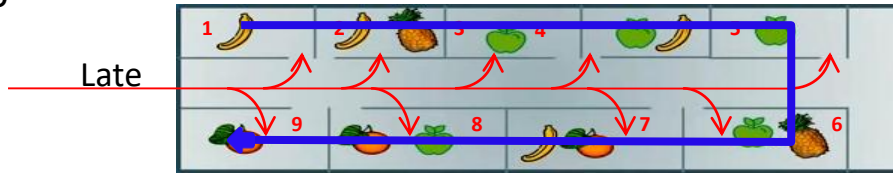


EmployeeID	PersonID	FirstName	LastName
1	1	Eralper	YILMAZ
2	3	Robert	Vieira
3	607	Guy	Gilbert
4	608	Kevin	Brown
5	609	Roberto	Tamburello
6	610	Rob	Walters
7	611	Thierry	D'Hers
8	612	David	Bradley
9	613	JoLynn	Dobney
10	614	Ruth	Ellerbrock
11	615	Gail	Erickson
12	616	Barry	Johnson
13	617	Josief	Goldberg
14	618	Terri	Duffy
15	619	Sidney	Higa



# Why use indexes?

- An **index** in database is similar to an index in a book
- **Indexes** in database help speed up search queries. Allow find data in a table without scanning the entire table.



# Table Indexes (1/3)

```
CREATE TABLE dbo.PhoneBook (  
    LastName        varchar(50) NOT NULL,  
    FirstName        varchar(50) NOT NULL,  
    PhoneNumber      varchar(50) NOT NULL  
);
```

```
SELECT PhoneNumber  
FROM   dbo.PhoneBook  
WHERE  LastName = 'Logan' AND FirstName = 'Todd';
```

Alexander, Mary  
344-555-0133  
Kurtz, Jeffrey  
452-555-0179  
Vessa, Robert  
560-555-0171  
Thames, Judy  
799-555-0118

Martinez, Frank  
171-555-0147  
Haines, Betty  
867-555-0114  
Burnett, Linda  
121-555-0121  
Harris, Keith  
170-555-0127

Kitt, Sandra  
303-555-0117  
Brewer, Alan  
494-555-0134  
Campbell, Frank  
491-555-0132  
Logan, Todd  
783-555-0110

...

Clayton, Jane  
206-555-0195  
Johnson, Brian  
320-555-0134  
Liu, David  
440-555-0132  
Diaz, Brenda  
147-555-0192

# Table Indexes (2/3)

```
CREATE TABLE dbo.PhoneBook (  
    LastName        varchar(50) NOT NULL,  
    FirstName        varchar(50) NOT NULL,  
    PhoneNumber varchar(50) NOT NULL  
);
```

Result:  
783-555-0110

```
SELECT PhoneNumber  
FROM dbo.PhoneBook  
WHERE LastName = 'Logan' AND FirstName = 'Todd';
```

Alexander, Mary 344-555-0133	Martinez, Frank 171-555-0147	Kitt, Sandra 303-555-0117	Clayton, Jane 206-555-0195
Kurtz, Jeffrey 452-555-0179	Haines, Betty 867-555-0114	Brewer, Alan 494-555-0134	Johnson, Brian 320-555-0134
Vessa, Robert 560-555-0171	Burnett, Linda 121-555-0121	Campbell, Frank 491-555-0132	Liu, David 440-555-0132
Thames, Judy 799-555-0118	Harris, Keith 170-555-0127	Logan, Todd 783-555-0110	Diaz, Brenda 147-555-0192

## ■ There are 2 types of major Indexes:

### ✓ ***Clustered***

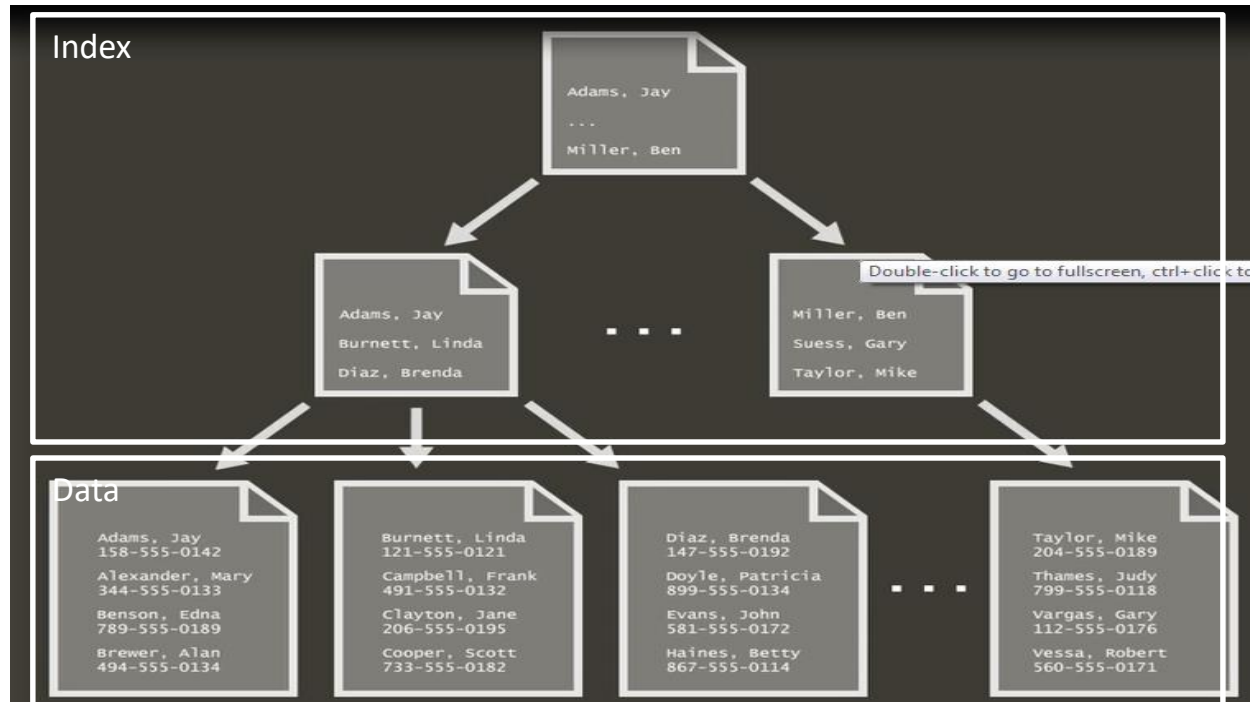
- Data is stored in the order on the clustered index
- Only 1 clustered index per table
- Usually the Primary Key
- Sort and store the data rows in the table based on their key value.

### ✓ ***Non-clustered***

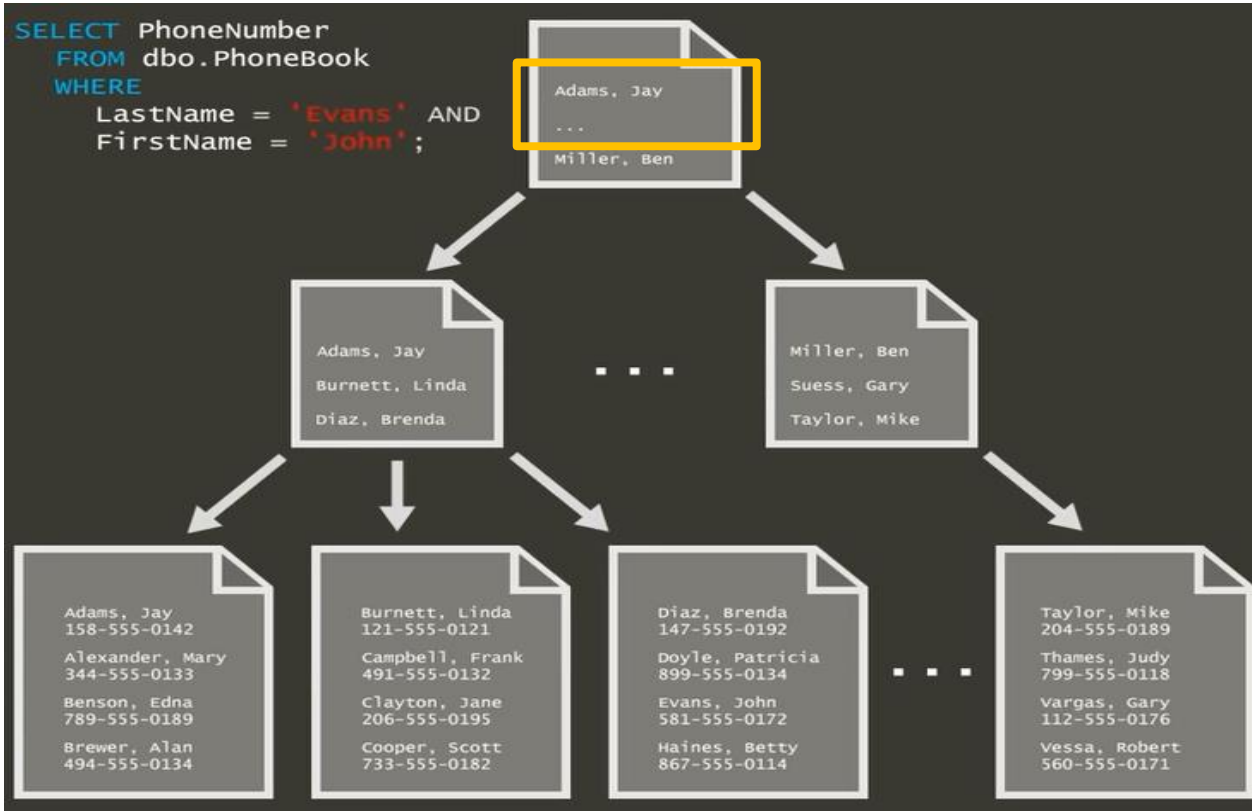
- Data is not stored in the order on the non clustered index
- Have a structure completely separate from the data rows.

# Clustered Index

```
CREATE CLUSTERED INDEX IX_PhoneBook_CI  
ON dbo.PhoneBook (LastName, FirstName)
```

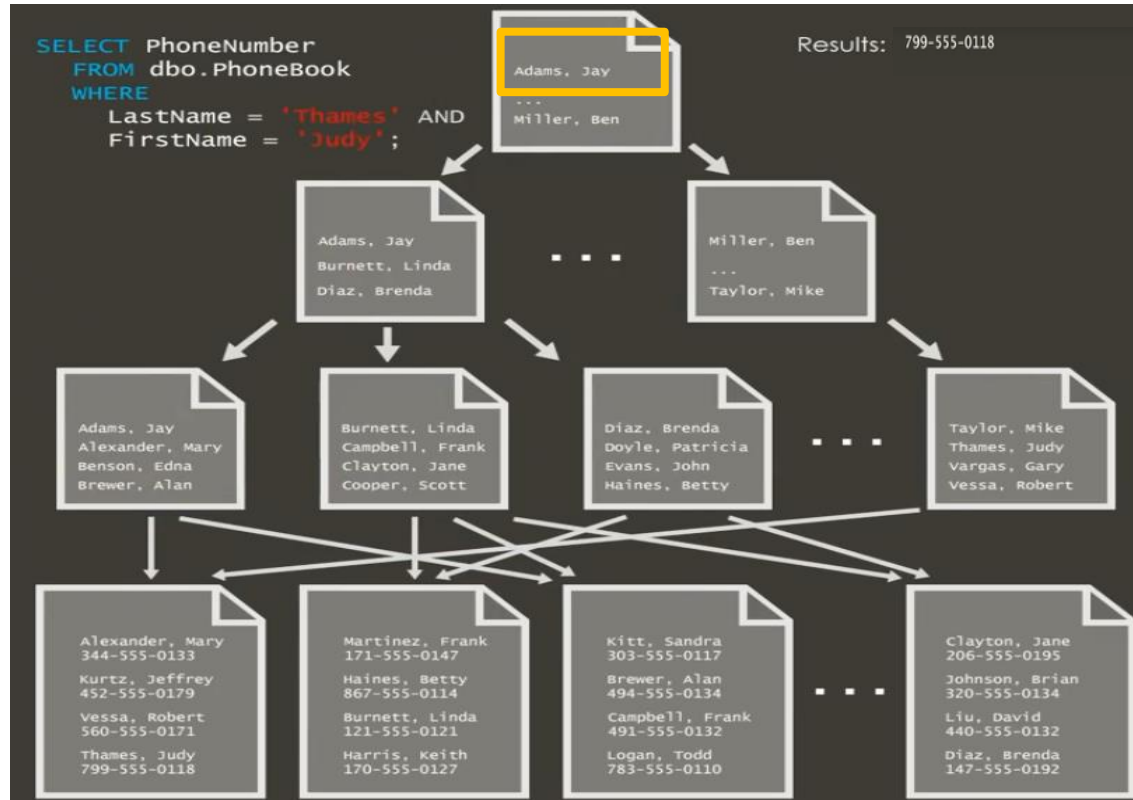


# Clustered Index





# Non - Clustered Index



# Creating an Index

- Create a new index:

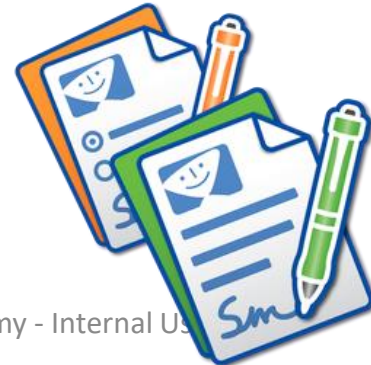
```
CREATE INDEX index_name  
ON table_name (column1_name, column2_name, ...)
```

- Deleting an Index

```
DROP INDEX table_name.index_name
```

## ✓ Table Indexes

- ✓ Why use indexes?
- ✓ Create, maintain and use index



# Thank you

