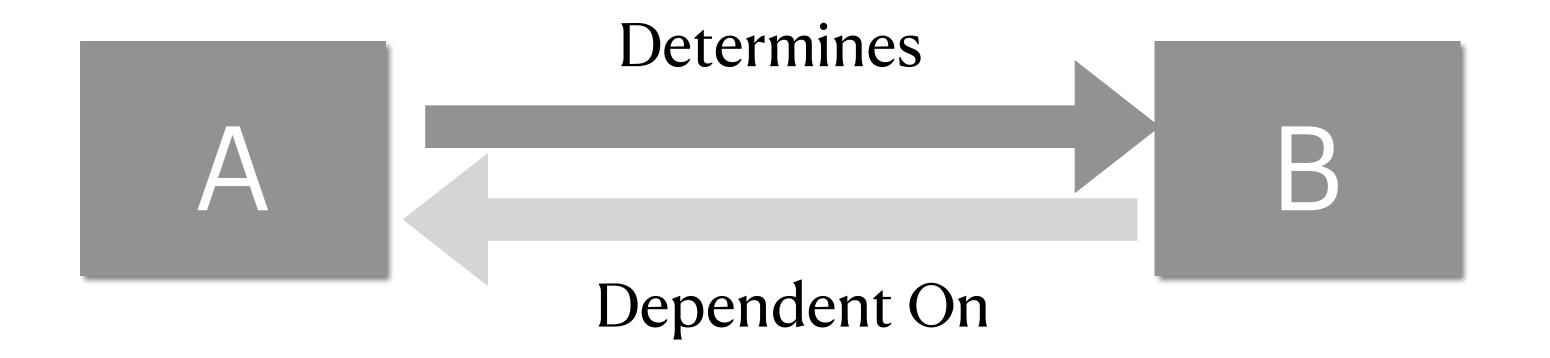# Functional Dependency

- In order to understand Normal Forms and Normalization Process, we need to understand the Functional Dependency first.

- Functional Dependencies describe the relationship among attributes in the same relation.

A Graphic View

- If A determines B, then B is functional dependent on A.
- A → B is a deterministic relationship, and is a functional dependency.

Determines

A → B

Dependent On

Example

- EmpID determines FirstName, so EmpID → FirstName
- Does FirstName determine EmpID?
- No. Thus, There is no ~~FirstName → EmpID~~

EmpID	FirstName	LastName	DoB	Position	Department	StoreID
#20399	John	Ford	1998/2/12	Manager	HR	#1506
#30123	Anne	Brand	2001/3/12	Intern	Marketing	#1546
#12524	David	Biden	2000/2/20	Assistant	Sales	#1524
#14517	William	Potter	2001/9/12	Senior Manager	HR	#1506
#15214	Mary	Alexander	2001/9/12	Assistant	IT	#1524
#11032	Rose	Smith	1999/1/21	Intern	IT	#1503
#02012	Julie	Smith	1977/12/1	Senior Manager	IT	#1503
#78123	Angela	White	1967/4/4	Senior Manager	HR	#1546
#21342	John	Ford	1983/11/11	Manager	IT	#1546

Example

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#20399	John	Ford	1998/2/12	Manager	HR	#1506
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#12524	David	Biden	2000/2/20	Assistant	Sales	#1524
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#15214	Mary	Alexander	2001/9/12	Assistant	IT	#1524
#11032	Rose	Smith	1999/1/21	Intern	IT	#1503
#02012	Julie	Smith	1977/12/1	Senior Manager	IT	#1503
#78123	Angela	White	1967/4/4	Senior Manager	HR	#1546
#21342	John	Ford	1983/11/11	Manager	IT	#1546

- Find FDs in the relation:
  - EmpID →FirstName, LastName, DoB, Position, Department, StoreID
  - FirstName + LastName → Position?

FD Holds for All Time

- Examine sample data is helpful to reject Functional Dependencies.

- However, in order to establish a Functional Dependency, we need to consider All possible data.

- Even in the sample data, FirstName + LastName determine position, in real life, it is not true.

  - Thus, FirstName + LastName → Position is not true.

Practice

- Let's do more practice in Lab1.