Basic Database Terminology

Relational Schemas: Primary Key

Relational Schemas: Primary Key

Sales			
purchase_number	**date_of_purchase**	**customer_id**	**item_code**
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/13/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

Customers				
customer_id	first_name	last_name	email_address	number_of_complaints
1	John	McKinley	john.mackinley@365careers.com	0
2	Elizabeth	McFarlane	e.mcfarlane@365careers.com	2
3	Kevin	Lawrence	kevin.lawrence@365careers.com	1
4	Catherine	Winnfield	c.winnfield@365careers.com	0

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/13/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

Customers

customer_id	first_name	last_name	email_address	number_of_complaints
1	John	McKinley	john.mackinley@365careers.com	0
2	Elizabeth	McFarlane	e.mcfarlane@365careers.com	2
3	Kevin	Lawrence	kevin.lawrence@365careers.com	1
4	Catherine	Winnfield	c.winnfield@365careers.com	0

Items

item_code	item	unit_price_usd	company_id	company	headquarters_phone_number
A_1	Lamp	20	1	Company A	+1 (202) 555-0196
A_2	Desk	250	1	Company A	+1 (202) 555-0196
B_1	Lamp	30	2	Company B	+1 (202) 555-0152
B_2	Desk	350	2	Company B	+1 (202) 555-0152
C_1	Chair	150	3	Company C	+1 (229) 853-9913
D_1	Loudspeakers	400	4	Company D	+1 (618) 369-7392

Sales

purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/13/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

365 Careers

Relational Schemas: Primary Key

Customers

customer_id	first_name	last_name	email_address	number_of_complaints
1	John	McKinley	john.mackinley@365careers.com	0
2	Elizabeth	McFarlane	e.mcfarlane@365careers.com	2
3	Kevin	Lawrence	kevin.lawrence@365careers.com	1
4	Catherine	Winnfield	c.winnfield@365careers.com	0

Items

item_code	item	unit_price_usd	company_id	company	headquarters_phone_number
A_1	Lamp	20	1	Company A	+1 (202) 555-0196
A_2	Desk	250	1	Company A	+1 (202) 555-0196
B_1	Lamp	30	2	Company B	+1 (202) 555-0152
B_2	Desk	350	2	Company B	+1 (202) 555-0152
C_1	Chair	150	3	Company C	+1 (229) 853-9913
D_1	Loudspeakers	400	4	Company D	+1 (618) 369-7392

Sales

purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/13/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Companies

company	Headquarters_Phone_number	company_id
Company A	+1 (202) 555-0196	1
Company B	+1 (202) 555-0152	2
Company C	+1 (229) 853-9913	3
Company D	+1 (618) 369-7392	4

365 Careers

Relational Schemas: Primary Key

- these tables have a tabular shape

365 Careers

Relational Schemas: Primary Key

- these tables have a tabular form

- a relational schema can be applied to represent them

365 Careers

Relational Schemas: Primary Key

Customers

customer_id	first_name	last_name	email_address	number_of_complaints
1	John	McKinley	john.mackinley@365careers.com	0
2	Elizabeth	McFarlane	e.mcfarlane@365careers.com	2
3	Kevin	Lawrence	kevin.lawrence@365careers.com	1
4	Catherine	Winnfield	c.winnfield@365careers.com	0

Items

item_code	item	unit_price_usd	company_id	company	headquarters_phone_number
A_1	Lamp	20	1	Company A	+1 (202) 555-0196
A_2	Desk	250	1	Company A	+1 (202) 555-0196
B_1	Lamp	30	2	Company B	+1 (202) 555-0152
B_2	Desk	350	2	Company B	+1 (202) 555-0152
C_1	Chair	150	3	Company C	+1 (229) 853-9913
D_1	Loudspeakers	400	4	Company D	+1 (618) 369-7392

Sales

purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/13/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Companies

company	Headquarters_Phone_number	company_id
Company A	+1 (202) 555-0196	1
Company B	+1 (202) 555-0152	2
Company C	+1 (229) 853-9913	3
Company D	+1 (618) 369-7392	4

Relational Schemas: Primary Key

Customers

customer_id	first_name	last_name	email_address	number_of_complaints
1	John	McKinley	john.mackinley@365careers.com	0
2	Elizabeth	McFarlane	e.mcfarlane@365careers.com	2
3	Kevin	Lawrence	kevin.lawrence@365careers.com	1
4	Catherine	Winnfield	c.winnfield@365careers.com	0

sales per customer of our company

Sales

purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/13/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Items

item_code	item	unit_price_usd	company_id	company	headquarters_phone_number
A_1	Lamp	20	1	Company A	+1 (202) 555-0196
A_2	Desk	250	1	Company A	+1 (202) 555-0196
B_1	Lamp	30	2	Company B	+1 (202) 555-0152
B_2	Desk	350	2	Company B	+1 (202) 555-0152
C_1	Chair	150	3	Company C	+1 (229) 853-9913
D_1	Loudspeakers	400	4	Company D	+1 (618) 369-7392

Companies

company	Headquarters_Phone_number	company_id
Company A	+1 (202) 555-0196	1
Company B	+1 (202) 555-0152	2
Company C	+1 (229) 853-9913	3
Company D	+1 (618) 369-7392	4

365 Careers

Relational Schemas: Primary Key

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/13/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

the dates of a few purchases may coincide

365 Careers

Relational Schemas: Primary Key

Sales			
purchase_number	**date_of_purchase**	**customer_id**	**item_code**
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

the ID of a customer may appear a few times

365 Careers

Relational Schemas: Primary Key

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

there is a possibility to see the same item code a few times

Relational Schemas: Primary Key

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

all the numbers in this column will be different

Relational Schemas: Primary Key

primary key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

365 Careers

● **Primary Key**

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

365 Careers

Relational Schemas: Primary Key

Primary Key

> a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

365 Careers

Relational Schemas: Primary Key

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

- in one table, you cannot have 3 or 4 primary keys

365 Careers

Relational Schemas: Primary Key

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

- in one table, you cannot have 3 or 4 primary keys

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

- **Primary Key**

  may be composed of a set of columns

365 Careers

Relational Schemas: Primary Key

Primary Key

may be composed of a set of columns

e.g. "purchase_number" + "date_of_purchase"

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	9/3/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

- ## Primary Key

  may be composed of a set of columns

  e.g. "purchase_number" + "date_of_purchase"

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
1	9/3/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

Primary Key

one-column primary key = all purchases will be recorded under a different number

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

365 Careers

Relational Schemas: Primary Key

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

- in one table, you cannot have 3 or 4 primary keys

365 Careers

Relational Schemas: Primary Key

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

- in one table, you cannot have 3 or 4 primary keys

- primary keys are the unique identifiers of a table

365 Careers

Relational Schemas: Primary Key

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

- in one table, you cannot have 3 or 4 primary keys

- primary keys are the unique identifiers of a table

- cannot contain null values!

365 Careers

Relational Schemas: Primary Key

● <u>**Primary Key**</u>

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

- **Primary Key**

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

Relational Schemas: Primary Key

Sales

purchase number
date_of_purchase
customer_id   (FK)
item_code   (FK)

365 Careers

Relational Schemas: Primary Key

Sales

purchase_number
date_of_purchase
customer_id   (FK)
item_code   (FK)

Table name: Sales
Primary key: purchase_number
Other fields: date_of_purchase, customer_id, item_code

Relational Schemas: Primary Key

Sales

purchase number

date_of_purchase

customer_id   (FK)

item_code   (FK)

=

Sales			
purchase_number	date_of_purchase	customer_id	item_code
1	9/3/2016	1	A_1
2	12/2/2016	2	C_1
3	4/15/2017	3	D_1
4	5/24/2017	1	B_2
5	5/25/2017	4	B_2
6	6/6/2017	2	B_1
7	6/10/2017	4	A_2
8	6/10/2017	3	C_1
9	7/20/2017	1	A_1
10	8/11/2017	2	B_1

365 Careers

Relational Schemas: Primary Key

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

- in one table, you cannot have 3 or 4 primary keys

- primary keys are the unique identifiers of a table

- cannot contain null values!

365 Careers

Primary Key

a column (or a set of columns) whose value exists and is unique for every record in a table is called a **primary key**

- each table can have one and only one primary key

- in one table, you cannot have 3 or 4 primary keys

- primary keys are the unique identifiers of a table

- cannot contain null values!

- not all tables you work with will have a primary key

365 Careers

relational schema

Relational Schemas: Primary Key

database schema

Customers

customer_id
first_name
last_name
email_address
number_of_complaints

Sales

purchase number
date_of_purchase
customer_id   (FK)
item_code   (FK)

Items

item code
item
unit_price
company_id   (FK)

Companies

company id
company_name
headquarters_phone_number
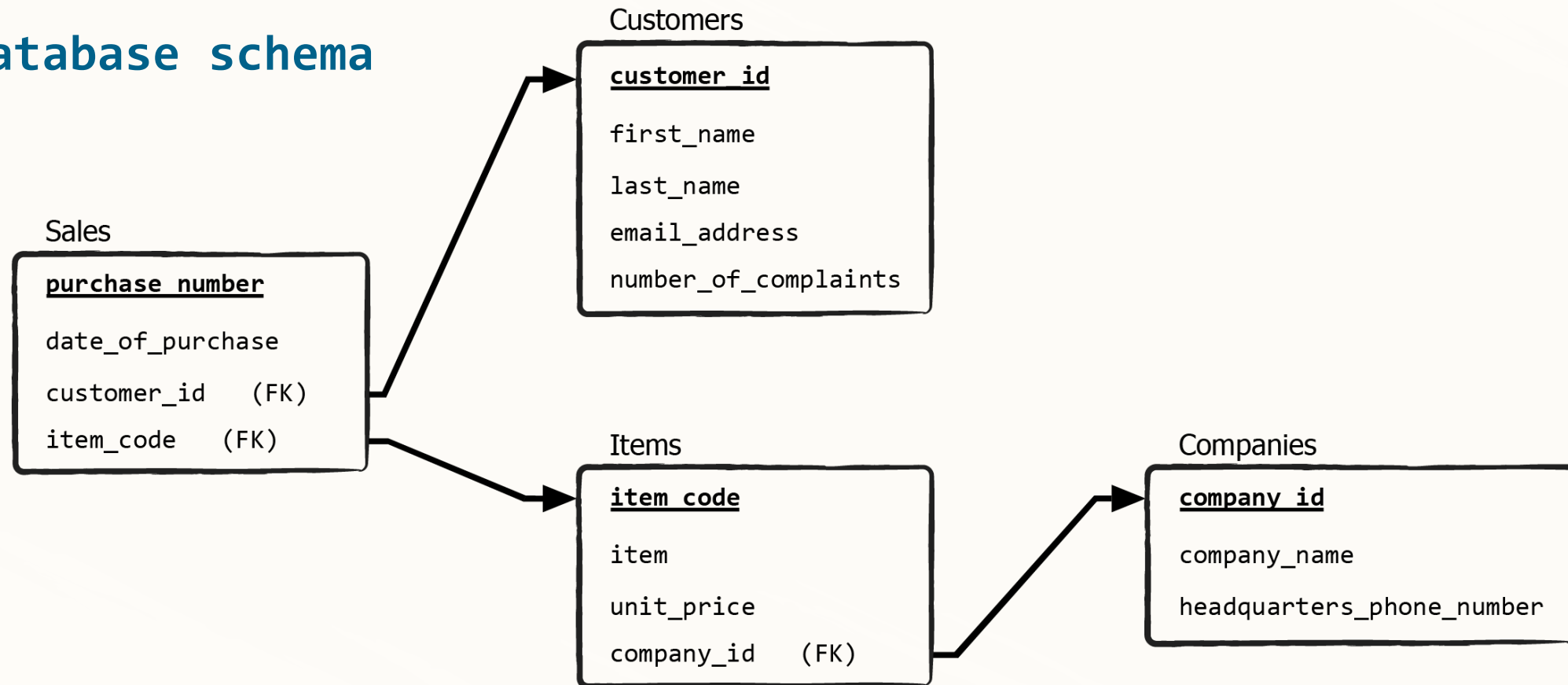
Relational Schemas: Primary Key

database schema

(relational schemas)

Sales

purchase number
date_of_purchase
customer_id   (FK)
item_code   (FK)

Customers

customer id
first_name
last_name
email_address
number_of_complaints

Items

item code
item
unit_price
company_id   (FK)

Companies

company id
company_name
headquarters_phone_number

365 ılı Careers