

Normalization example

We are designing a database for storing data about friends.

So this is the first version

<u>friend_id</u>	name	birth_day	address	phone_home	phone_work	phone_gsm
1	Matti	01.05.82	Tuulentie 4 01260 Vantaa	09-123456	09-818161	040-234674
2	Maija	02.03.78	Kotkantie 1 90250 Oulu	NULL	08-478235	050-737373
3	Liisa	01.01.77	Kotkantie 2 90250 Oulu	NULL	NULL	040-634646

Cons:

-address-field contains several parts

-phone-number is several times

Database is not in I NF

The disadvantages are:

-A lot of NULL-values

-If somebody has 4 phones, you have to change the database

-The same street-address/postal-code several times

The answer

<u>friend_id</u>	name	birth_day	street_address	postal_code	post_place	phone	<u>phone_type</u>
1	Matti	01.05.82	Tuulentie 4	01260	Vantaa	09-123456	koti
1	Matti	01.05.82	Tuulentie 4	01260	Vantaa	09-818161	työ
1	Matti	01.05.82	Tuulentie 4	01260	Vantaa	040-234674	gsm
2	Maija	02.03.78	Kotkantie 1	90250	Oulu	08-478235	työ
2	Maija	02.03.78	Kotkantie 1	90250	Oulu	050-737373	gsm
3	Liisa	01.01.77	Kotkantie 2	90250	Oulu	040-634646	gsm

Now the Database is in I NF

Cons:

birth_day ← friend_id. So birth_day is depended about a part of the primary key, not about the whole key (and the same with street address) **Database is not in II NF**

The disadvantages are:

-If you add a new phone to somebody, you have to fill several fields.

Answer

<u>friend_id</u>	name	birth_day	street_address	postal_code	post_place
1	Matti	01.05.82	Tuulentie 4	01260	Vantaa
2	Maija	02.03.78	Kotkantie 1	90250	Oulu
3	Liisa	01.01.77	Kotkantie 2	90250	Oulu

<u>friend_id</u>	phone	<u>phone_type</u>
1	09-123456	koti
1	09-818161	työ
1	040-234674	gsm
2	08-478235	työ
2	050-737373	gsm
3	040-634646	gsm

Now both tables (and also the Database) is in II NF

Const

postplace ← postal_code even postal_code is not primary key

Database is not in III NF

Disadvantages;

-You have to fill the same postplace several times, even if the info is already in your database

Answer

<u>friend_id</u>	name	birth_day	street_address	postal_code
1	Matti	01.05.82	Tuulentie 4	01260
2	Maija	02.03.78	Kotkantie 1	90250
3	Liisa	01.01.77	Kotkantie 2	90250

<u>postal_code</u>	post_place
01260	Vantaa
90250	Oulu

<u>friend_id</u>	phone	<u>phone_type</u>
1	09-123456	koti
1	09-818161	työ
1	040-234674	gsm
2	08-478235	työ
2	050-737373	gsm
3	040-634646	gsm

Now all tables (and also the database) is in III NF