Translating ER into RM

The best way to learn this mechanism is to poceed by examples.
Let's start with this classic:

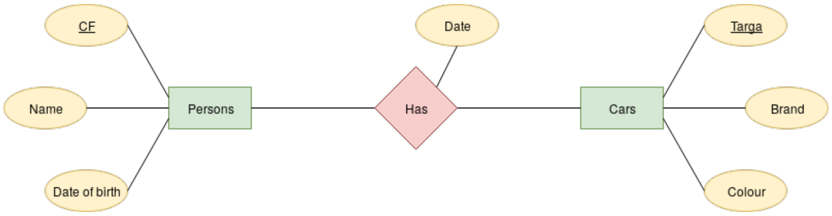

Figure 1: The classic example

When we want to translate an Entity Relationship Diagram (ERD) into an Relation Model (RM) we have to follow certain rules, let's check them out.

Rule #1 Every entity is a table and its attributes are the table's columns.

Rule #2 Each relation is a table and its attributes are part of the table's columns; also the keys of the entities involved in the relation become columns and they are flagged as Foreign Keys (FK). The FKs must be the table Key.

Let's put this in practice:

PERSONS

CF	Name	Birth date
1	John	1978
5	Mary	1974

`PERSONS(CF, Name, Birth date)`

CARS

Targa	Brand	Color
xy	VW	Red
uv	Toyota	Blue

`CARS(Targa, Brand, Color)`

That was pretty easy, wasn't it?
Now it's time to draw the relation table:

HAS

Codice Fiscale	Date	Targa
1	2002	xy
5	2004	ub

`HAS(CF Targa, Date)`

Well, that's clear. Now it's time to mix up things a little bit. What if a car can't be owned by different people? (see 2)

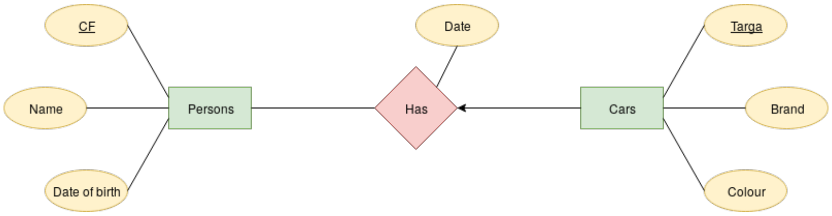

Figure 2: A car now can have at most one owner

We must use only the Targa as key in Has relation.
And what if we want the car to have also at least one owner? (see 3)

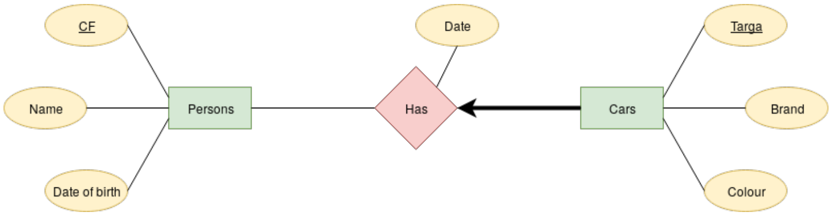

Figure 3: A car now can have at most one owner

Now that a car must be owned by one person it has no more sense to keep HAS table and CARS table divided: the wittest solution is to delete HAS table and introduce in CARS table two columns, one for Date and one for CF, which will be a FK. Last but not least the CF field must be mapped as not-null. That's the representation in RM:

CARS

Targa	Brand	Color	CF	Date
xy	VW	Red	1	2002
uv	Toyota	Blue	5	2004

CARS($\underline{\texttt{Targa}}$, Brand, Color, CF, Date)
CF not null
CF Foreign Key to PERSONS