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Relationships – Part 1

Relational Databases Basics

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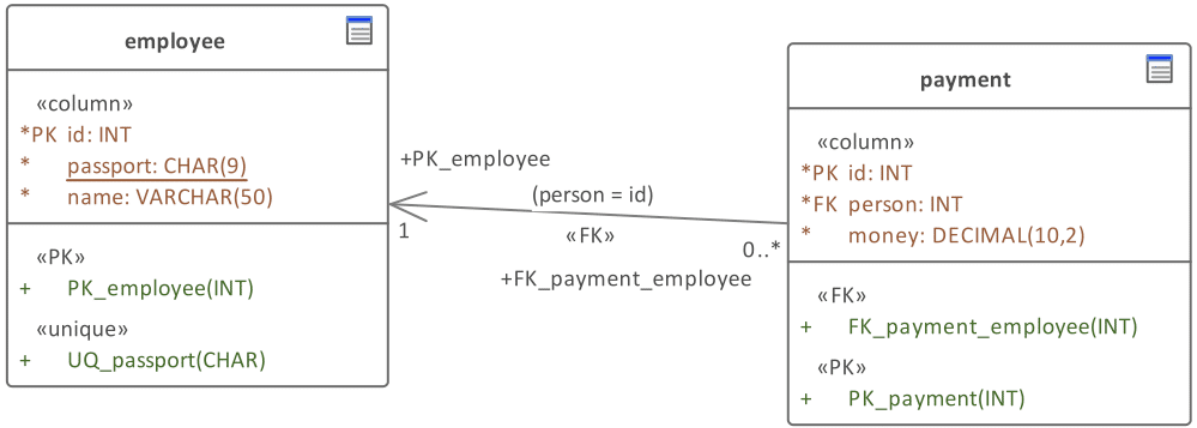
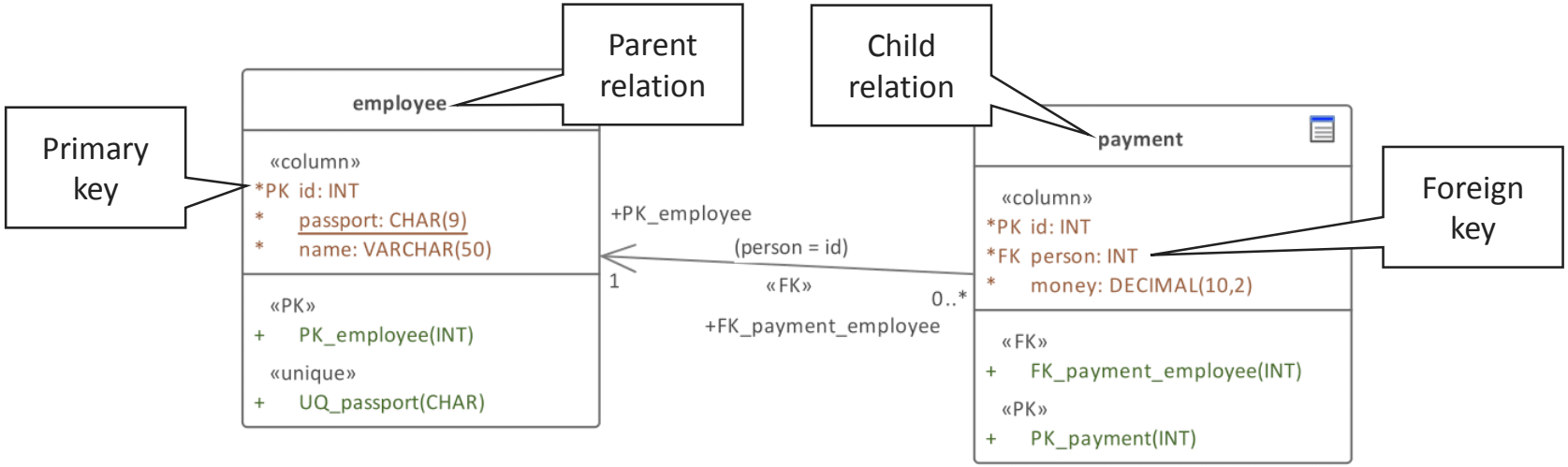
Read and remember!

Relationship – an association among entities.

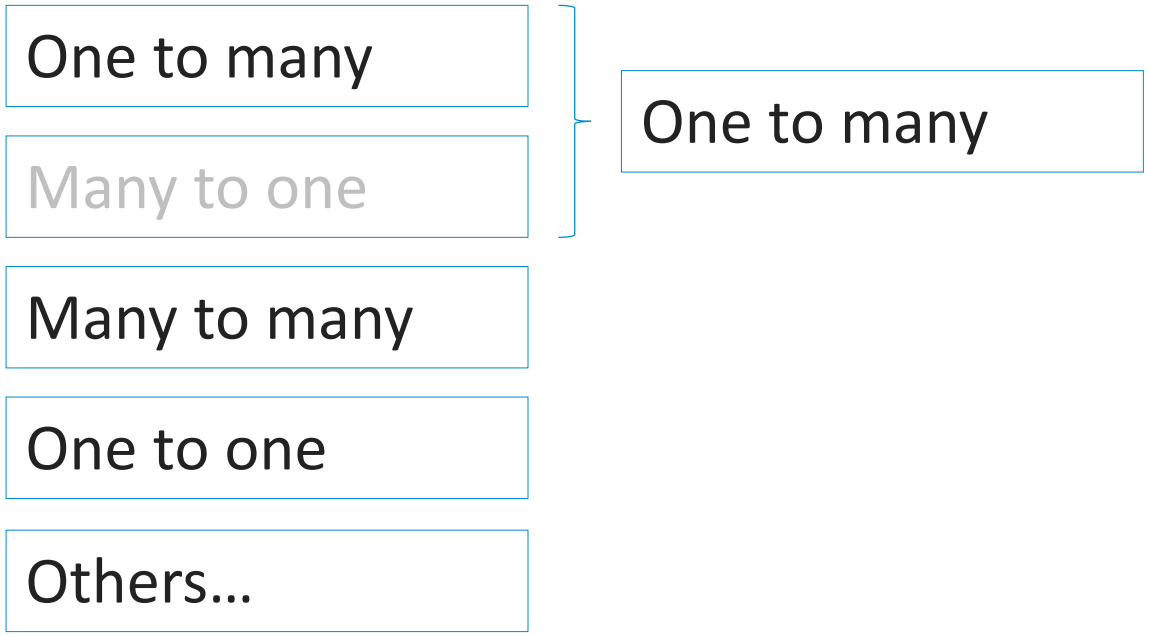


Relationship organisation

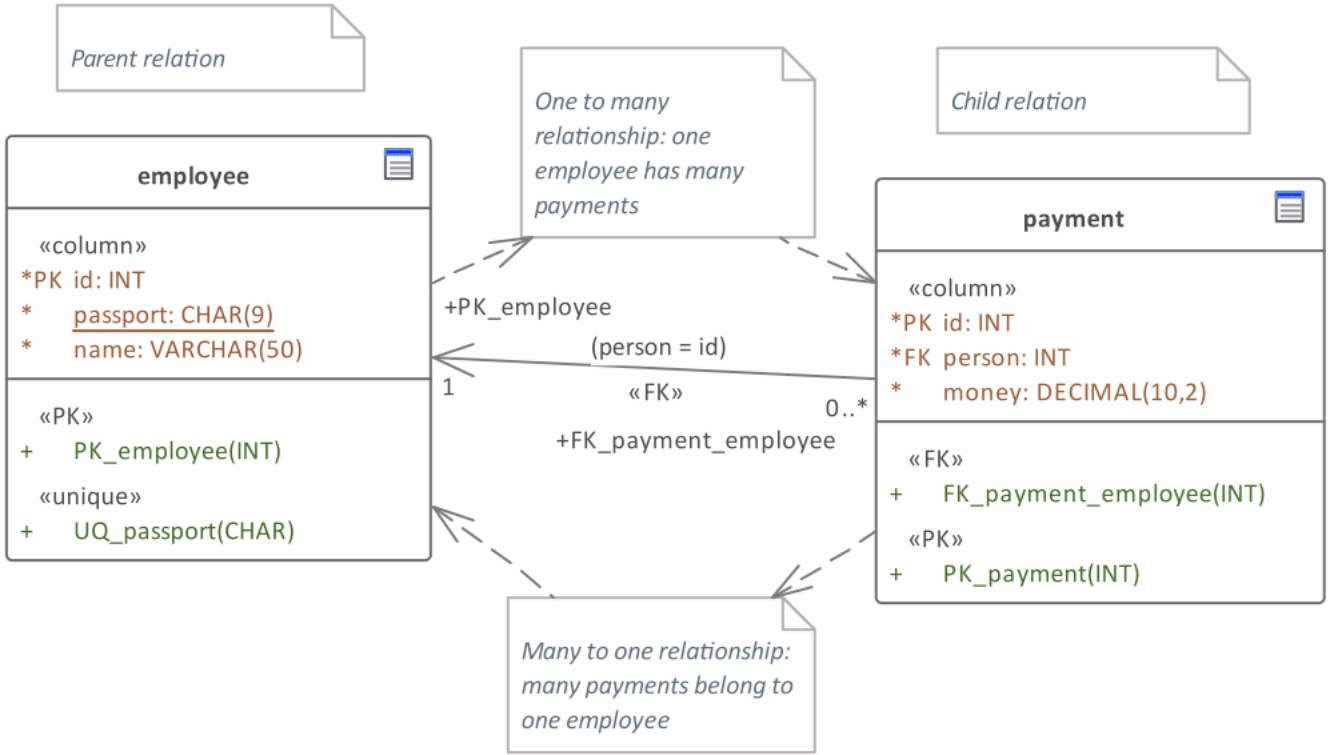
Relationships are based on key migration: the primary key of a “parent relation” migrates to a “child relation” and becomes the foreign key.



Relationship types (overview)



One to many and many to one relationships



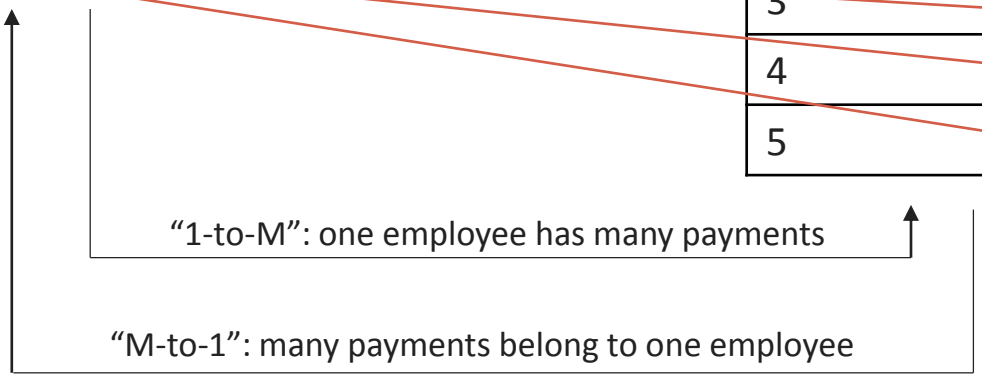
One to many and many to one relationships

employee

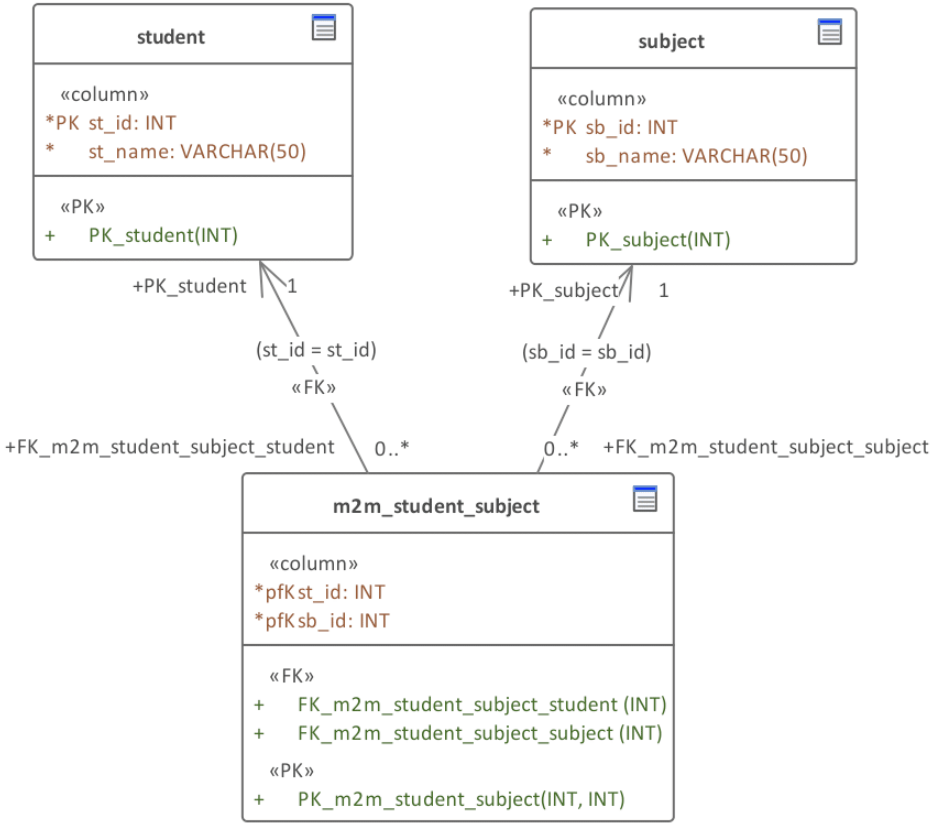
id	passport	name
1	AA1122334	Ivanov I.I.
2	AB4455667	Petrov P.P.
3	AC5566778	Sidorov S.S.
4	BP8877665	Sidorov S.S.

payment

id	person	money
1	2	100
2	2	100
3	4	200
4	4	150
5	4	130



Many to many relationship



Many to many relationship

student

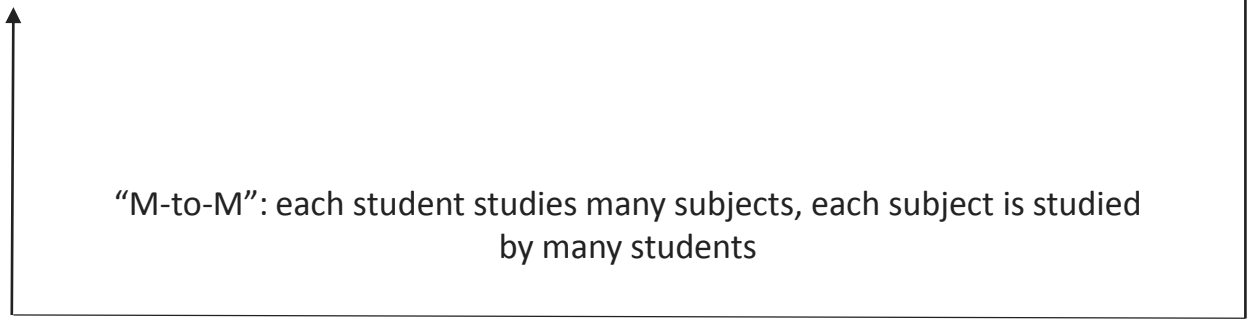
st_id	st_name
1	Ivanov I.I.
2	Petrov P.P.
3	Sidorov S.S.
4	Sidorov S.S.

m2m_student_subject

st_id	sb_id
1	2
1	3
3	3

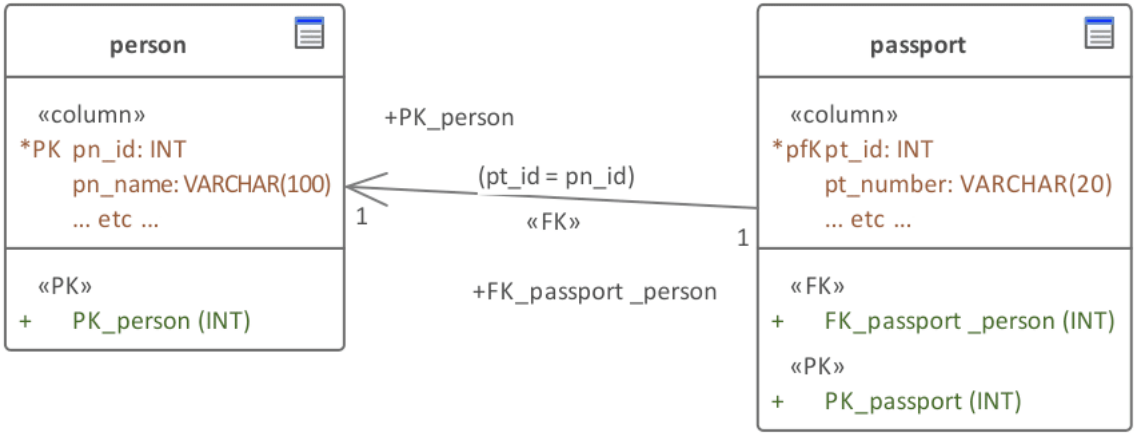
subject

sb_id	sb_name
1	Mathematics
2	Physics
3	Chemistry



"M-to-M": each student studies many subjects, each subject is studied by many students

One to one relationship



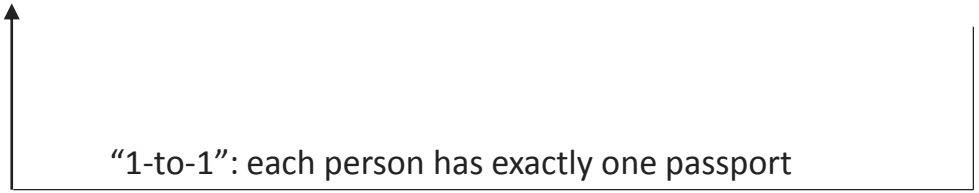
One to one relationship

person

pn_id	pn_name	…
1	Ivanov I.I.	
2	Petrov P.P.	
3	Sidorov S.S.	
4	Sidorov S.S.	

passport

pt_id	pt_number	…
1	AA1122334	
2	AB4455667	
3	AC5566778	
4	BP8877665	



One to one relationship: when do we need it

Subject matter requires

DBMS limitations on fields count in one table reached

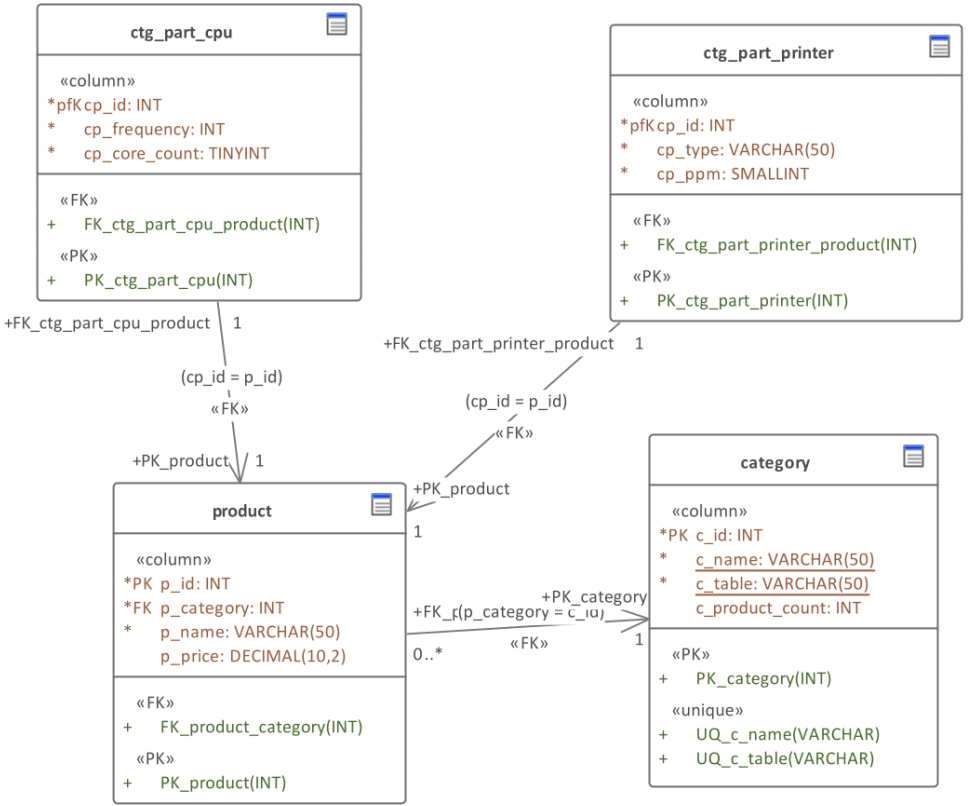
Performance optimization

Special cases (we'll see one soon)

If you don't have a "hard evidence" of 1-to-1 relationship necessity – there is just an error in your schema!

That “special case” for 1-to-1 relationships

Sometimes there are real world entities with a few common properties and a lot of special properties. In such a case we may use 1-to-1 relationships as follows in this schema.



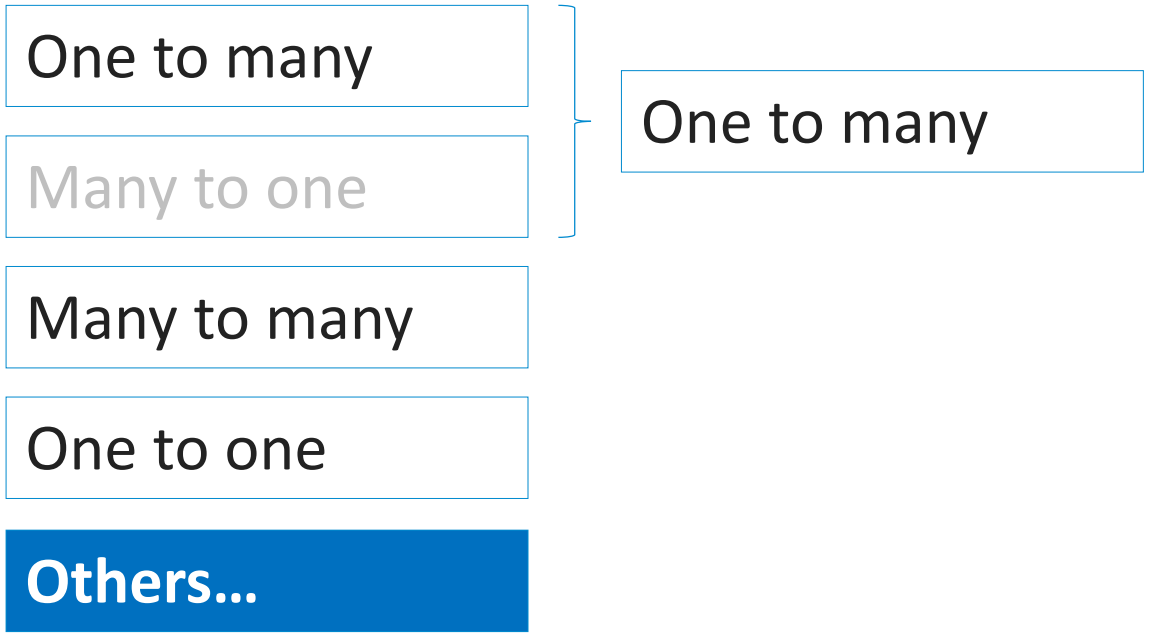
Read and remember!

One to many relationship – one record from a parent table has several corresponding records from a child table.

Many to many relationship – a record from table A has several corresponding records from table B, and vice versa.

One to one relationship – one record from a parent table has one corresponding record from a child table.

Relationship types (overview)

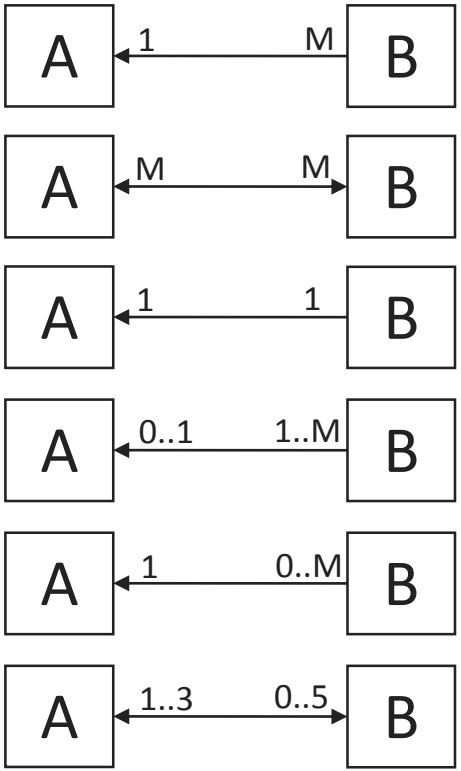


Read and remember!

Relationship cardinality – the number of elements on both “sides” of a relationship.

Relationship types (overview)

- One to many
- Many to many
- One to one
- **Others…**



And so on, there may be ANY combinations…

One ~~ring~~ relationship to rule them all

1-to-M is the only relationship that really exists in DBMS. All others are just “imaginary” for human convenience.

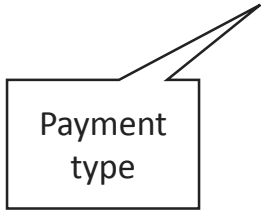
1-to-M relationship properties

employee

id	passport	name
1	AA1122334	Ivanov I.I.
2	AB4455667	Petrov P.P.
3	AC5566778	Sidorov S.S.
4	BP8877665	Sidorov S.S.

payment

id	person	money	type
1	2	100	Cash
2	2	100	Wire
3	4	200	Wire
4	4	150	Wire
5	4	130	Cash



M-to-M relationship properties

student

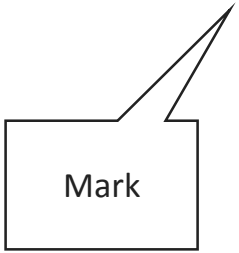
st_id	st_name
1	Ivanov I.I.
2	Petrov P.P.
3	Sidorov S.S.
4	Sidorov S.S.

m2m_student_subject

st_id	sb_id	mark
1	2	7
1	3	10
3	3	8

subject

sb_id	sb_name
1	Mathematics
2	Physics
3	Chemistry



1-to-1 relationship properties

person

pn_id	pn_name	…
1	Ivanov I.I.	
2	Petrov P.P.	
3	Sidorov S.S.	
4	Sidorov S.S.	

passport

pt_id	pt_number	…
1	AA1122334	
2	AB4455667	
3	AC5566778	
4	BP8877665	

Some info (but really its more an entity property, rather than a relationship property)

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