Where to put Foreign Keys?

General Rule to Place Foreign Key

Connectivity _1:M_:

- Enter the primary key from the _one_ side into the _many_ side

Connectivity _1:1_:

- Enter the primary key from the _mandatory_ side into the _optional_ side
- Otherwise – your choice

Connectivity _M:N_

- Sources of redundancies
- Need to replace M:N relationships
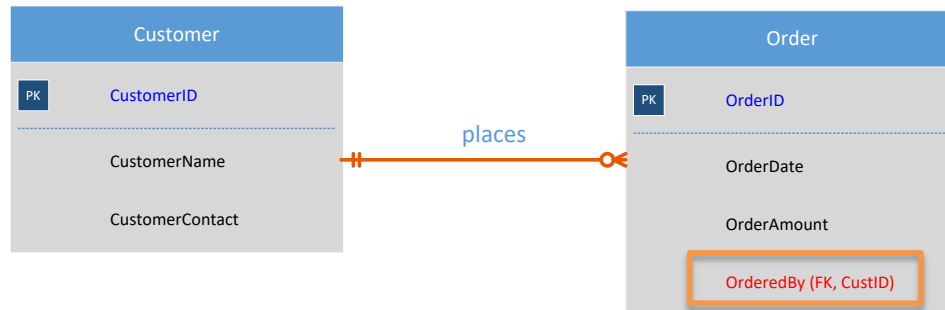
Connectivity & Participation – Examples

1:M relationship between Customer and Order
(order is optional to customer)

Customer

CustID	CustName	CustPhone
1	John	321
2	Cathy	455
3	Mohammad	788
4	Rupam	745
5	Polash	121

1 side

Order

OrderID	OrderDate	OrderAmount($)	OrderedBy (CustID)
11	21/08/2016	45	1
12	22/08/2016	45	3
13	23/08/2016	48	4
14	24/08/2016	34	1
15	25/08/2016	52	2
16	26/08/2016	78	3

M side (should have FKs)

Customer

PK CustomerID

CustomerName

CustomerContact

places

Order

PK OrderID

OrderDate

OrderAmount

OrderedBy (FK, CustID)

Connectivity & Participation – Examples

1:M relationship between Customer and Order
(order is mandatory to customer)

Customer

CustID	CustName	CustPhone
1	John	321
2	Cathy	455
3	Mohammad	788
4	Rupam	745
5	Polash	121

1 side

Order

OrderID	OrderDate	OrderAmount($)	OrderedBy (CustID)
11	21/08/2016	45	1
12	22/08/2016	45	3
13	23/08/2016	48	4
14	24/08/2016	34	1
15	25/08/2016	52	2
16	26/08/2016	78	3
17	27/08/2016	85	5

M side (should have FKs)

Customer	Order
PK CustomerID	PK OrderID
CustomerName	OrderDate
CustomerContact	OrderAmount
	OrderedBy (FK, CustID)

places

Connectivity & Participation – Examples

1:1 relationship between Person and License

License is **optional** to Person

Person

PersonID	PersonName	PersonPhone
1	John	321
2	Cathy	455
3	Mohammad	788
4	Rupam	745
5	Polash	121
6	Garth	345

1 side

License

LicenseNum	LiceExpiryDate	SpecialCode	BelongsTo (PersonID)
11	21/08/2016	P	1
12	22/08/2016	L	2
13	23/08/2016	F	3
14	24/08/2016	P	4

1 side (FKs are on optional side) → Why?
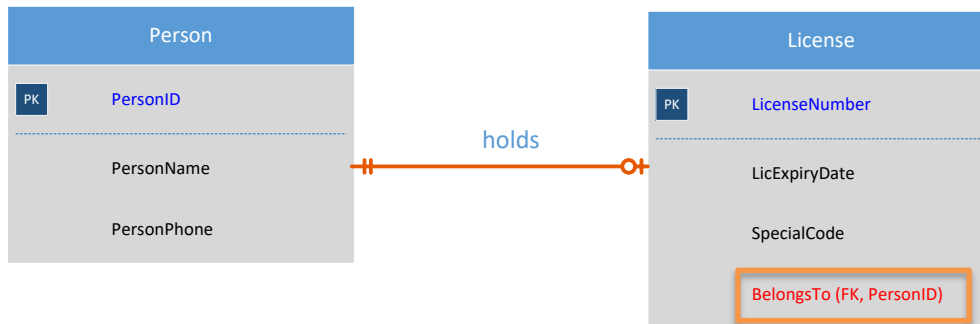
Person		License	
PK	PersonID	PK	LicenseNumber
	PersonName		LicExpiryDate
	PersonPhone		SpecialCode
			BelongsTo (FK, PersonID)

holds

Connectivity & Participation – Examples

1:1 relationship between Person and License

License is **optional** to Person

PersonID	PersonName	PersonPhone	LicenseNo
1	John	321	11
2	Cathy	455	12
3	Mohammad	788	13
4	Rupam	745	14
5	Polash	121	NULL
6	Garth	345	NULL

License			
LicenseNum	LiceExpiryDate	SpecialCode	BelongsTo (PersonID)
11	21/08/2016	P	1
12	22/08/2016	L	2
13	23/08/2016	F	3
14	24/08/2016	P	4

"redundant"

Putting FK on the mandatory creates many NULL values

Person

PK PersonID

PersonName

PersonPhone

holds

License

PK LicenseNumber

LicExpiryDate

SpecialCode
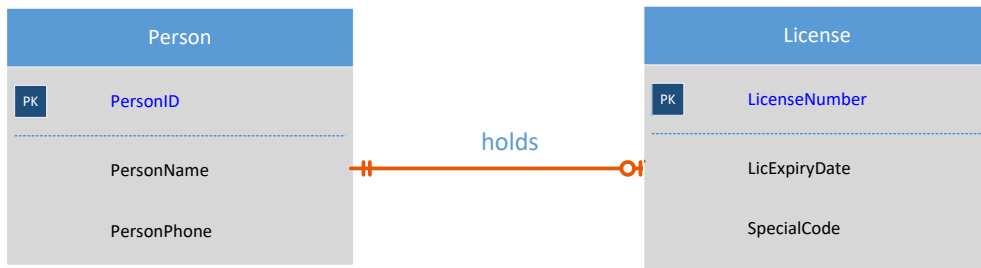
FK: LicenseNo

Connectivity & Participation – Examples

1:1 relationship between Person and License

License is **mandatory** to Person

Person

PersonID	PersonName	PersonPhone
1	John	321
2	Cathy	455
3	Mohammad	788
4	Rupam	745
5	Polash	121
6	Garth	345

1 side

License

LicenseNum	LiceExpiryDate	SpecialCode	BelongsTo (PersonID)
11	21/08/2016	P	1
12	22/08/2016	L	2
13	23/08/2016	F	3
14	24/08/2016	P	4
15	25/08/2016	L	5
16	26/08/2016	F	6

1 side (FKs are on right side)
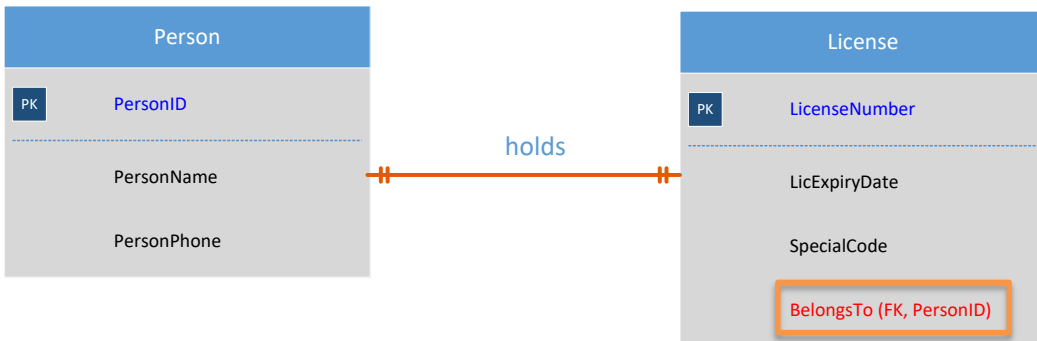
Person

PK PersonID

PersonName

PersonPhone

holds

License

PK LicenseNumber

LicExpiryDate

SpecialCode

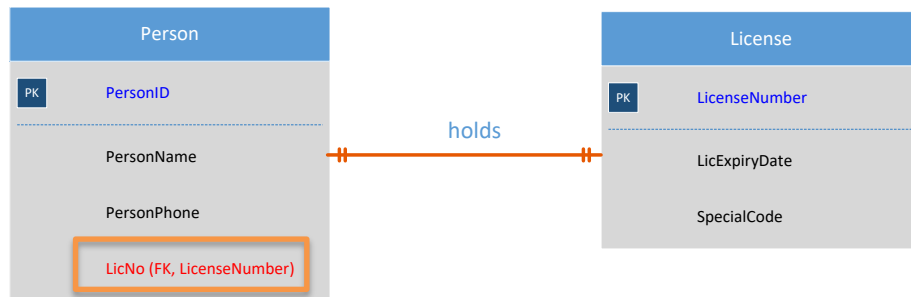BelongsTo (FK, PersonID)

Connectivity & Participation – Examples

1:1 relationship between Person and License

License is **mandatory** to Person

Person

PersonID	PersonName	PersonPhone	LicNumber
1	John	321	11
2	Cathy	455	12
3	Mohammad	788	13
4	Rupam	745	14
5	Polash	121	15
6	Garth	345	16

1 side (FKs are on left side)

License

LicenseNum	LiceExpiryDate	SpecialCode
11	21/08/2016	P
12	22/08/2016	L
13	23/08/2016	F
14	24/08/2016	P
15	25/08/2016	L
16	26/08/2016	F

1 side

Person
PK PersonID

PersonName
PersonPhone
LicNo (FK, LicenseNumber)

holds

License
PK LicenseNumber

LicExpiryDate
SpecialCode

Thank you