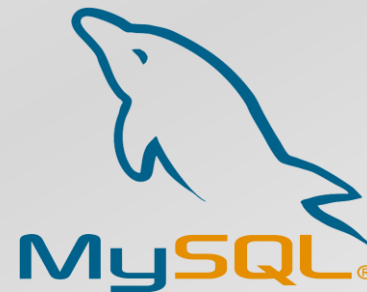


Chapter 4

The Relational Model Part 2

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Fadia Ala'eddin



RD Example

(DreamHome Case Study)

Branch

branchNo	street	city	postcode
B005	22 Deer Rd	London	SW1 4EH
B007	16 Argyll St	Aberdeen	AB2 3SU
B003	163 Main St	Glasgow	G11 9QX
B004	32 Manse Rd	Bristol	BS99 1NZ
B002	56 Clover Dr	London	NW10 6EU

Staff

staffNo	fName	lName	position	sex	DOB	salary	branchNo
SL21	John	White	Manager	M	1-Oct-45	30000	B005
SG37	Ann	Beech	Assistant	F	10-Nov-60	12000	B003
SG14	David	Ford	Supervisor	M	24-Mar-58	18000	B003
SA9	Mary	Howe	Assistant	F	19-Feb-70	9000	B007
SG5	Susan	Brand	Manager	F	3-Jun-40	24000	B003
SL41	Julie	Lee	Assistant	F	13-Jun-65	9000	B005

PropertyForRent

propertyNo	street	city	postcode	type	rooms	rent	ownerNo	staffNo	branchNo
PA14	16 Holhead	Aberdeen	AB7 5SU	House	6	650	CO46	SA9	B007
PL94	6 Argyll St	London	NW2	Flat	4	400	CO87	SL41	B005
PG4	6 Lawrence St	Glasgow	G11 9QX	Flat	3	350	CO40		B003
PG36	2 Manor Rd	Glasgow	G32 4QX	Flat	3	375	CO93	SG37	B003
PG21	18 Dale Rd	Glasgow	G12	House	5	600	CO87	SG37	B003
PG16	5 Novar Dr	Glasgow	G12 9AX	Flat	4	450	CO93	SG14	B003

Client

clientNo	fName	lName	telNo	prefType	maxRent	eMail
CR76	John	Kay	0207-774-5632	Flat	425	john.kay@gmail.com
CR56	Aline	Stewart	0141-848-1825	Flat	350	astewart@hotmail.com
CR74	Mike	Ritchie	01475-392178	House	750	mritchie01@yahoo.co.uk
CR62	Mary	Tregear	01224-196720	Flat	600	maryt@hotmail.co.uk

PrivateOwner

ownerNo	fName	lName	address	telNo	eMail	password
CO46	Joe	Keogh	2 Fergus Dr, Aberdeen AB2 7SX	01224-861212	jkeogh@lhh.com	*****
CO87	Carol	Farrel	6 Achray St, Glasgow G32 9DX	0141-357-7419	cfarrel@gmail.com	*****
CO40	Tina	Murphy	63 Well St, Glasgow G42	0141-943-1728	tinam@hotmail.com	*****
CO93	Tony	Shaw	12 Park Pl, Glasgow G4 0QR	0141-225-7025	tony.shaw@ark.com	*****

Viewing

clientNo	propertyNo	viewDate	comment
CR56	PA14	24-May-13	too small
CR76	PG4	20-Apr-13	too remote
CR56	PG4	26-May-13	
CR62	PA14	14-May-13	no dining room
CR56	PG36	28-Apr-13	

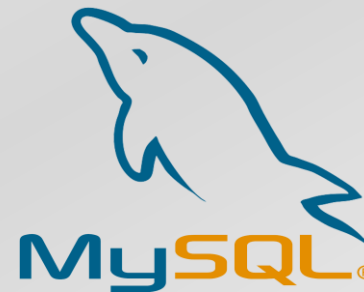
Registration

clientNo	branchNo	staffNo	dateJoined
CR76	B005	SL41	2-Jan-13
CR56	B003	SG37	11-Apr-12
CR74	B003	SG37	16-Nov-11
CR62	B007	SA9	7-Mar-12

RD Example

- The relational schema for the *DreamHome* is:

Branch	(<u>branchNo</u> , street, city, postcode)
Staff	(<u>staffNo</u> , fName, lName, position, sex, DOB, salary, branchNo)
PropertyForRent	(<u>propertyNo</u> , street, city, postcode, type, rooms, rent, ownerNo, staffNo, branchNo)
Client	(<u>clientNo</u> , fName, lName, telNo, prefType, maxRent, eMail)
PrivateOwner	(<u>ownerNo</u> , fName, lName, address, telNo, eMail, password)
Viewing	(<u>clientNo</u> , <u>propertyNo</u> , viewDate, comment)
Registration	(<u>clientNo</u> , <u>branchNo</u> , staffNo, dateJoined)



Integrity Constraints

- Restrictions on the set of values allowed for the attributes of relations, such as **domain constraints** that we have already seen.
- There are two important **integrity rules**, which are constraints or restrictions that apply to all instances of the database.
 - Entity integrity
 - Referential integrity.



NULL

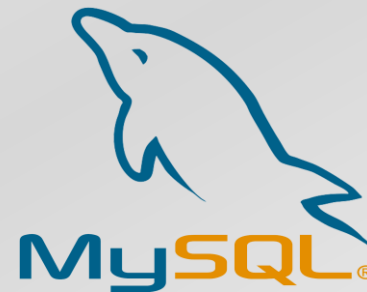
- Represents a value for an attribute that is currently unknown or is not applicable for this tuple.
- A null can be taken to mean the logical value “unknown.” It can mean that a value is not applicable to a particular tuple, or it could merely mean that no value has yet been supplied.
- null represents the absence of a value

clientNo	propertyNo	viewDate	comment
CR56	PA14	24-May-13	too small
CR76	PG4	20-Apr-13	too remote
CR56	PG4	26-May-13	
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ENTITY INTEGRITY

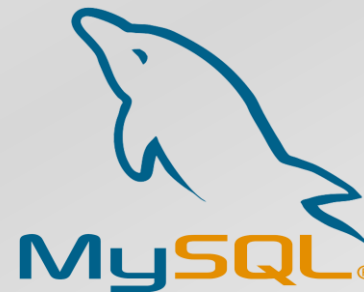
- This integrity rule applies to the primary keys of base relations.
- In a base relation, no attribute of a primary key can be null.
- Example :

primary key of the Viewing relation, comprising the client number (clientNo) and the property number (propertyNo). We should not be able to insert a tuple into the Viewing relation with a null for the clientNo attribute, or a null for the propertyNo attribute, or nulls for both attributes.



REFERENTIAL INTEGRITY

- If a foreign key exists in a relation, either the foreign key value must match a candidate key value of some tuple in its home relation or the foreign key value must be wholly null.
- For example, branchNo in the Staff relation is a foreign key targeting the branchNo attribute in the home relation, Branch. It should not be possible to create a staff record with branch number B025, for example, unless there is already a record for branch number B025 in the Branch relation.
- However, we should be able to create a new staff record with a null branch number to allow for the situation where a new member of staff has joined the company but has not yet been assigned to a particular branch office.



REFERENTIAL INTEGRITY

Branch

branchNo	street	city	postcode
B005	22 Deer Rd	London	SW1 4EH
B007	16 Argyll St	Aberdeen	AB2 3SU
B003	163 Main St	Glasgow	G11 9QX
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Staff

staffNo	fName	lName	position	sex	DOB	salary	branchNo
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SA9	Mary	Howe	Assistant	F	19-Feb-70	9000	B007
SG5	Susan	Brand	Manager	F	3-Jun-40	24000	B003
SL41	Julie	Lee	Assistant	F	13-Jun-65	9000	B005

GENERAL CONSTRAINTS

- Additional rules specified by the users or database administrators of a database that define or constrain some aspect of the enterprise

