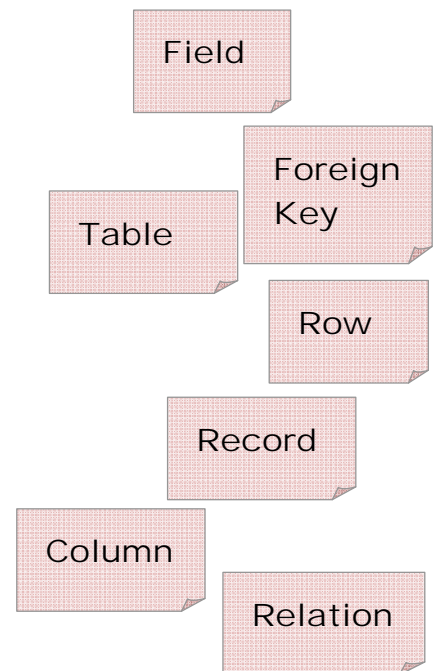


## TUTORIAL 2: Designing database tables SOLUTIONS

### Question 1

Feature in data model	Representation in RDBMS
Class (or entity)	table, relation
Attribute	field, column
Object	row, record
Relationship	foreign key

Copy this table and fill in the blank boxes using the correct words from the notes on the right - some boxes have more than one correct answer.



### Question 2

Here are some examples of items of data you might find in a database table. Decide which data type makes the most sense for each one. Some of the descriptions of the data have been left for you to think about – for example, what is the form of a UK postcode?

Field name	Description	Example	Data type
price	The price of an item	£23.54	money
postcode	Up to 8 characters of text	KA15 6TF	nvarchar(8)
comments	Large block of text, size not known in advance	A long, rambling comment...	ntext
quantity	Number of items in a purchase order	5	int
gender	One character, M or F	M	nvarchar(1) or bit
phoneNumber	Up to 11 digits if not including country code	01413313000	nvarchar(11)
dateOfBirth	Date	01/03/1987	datetime
photograph	A bitmap image	Image	image
appointment	Time and day	12:30 01/03/2008	datetime
lastName	String of text, set sensible limit on length	Brown	nvarchar(20)

#### SOME SQL DATA TYPES

nvarchar(size)

ntext

int

bigint

float

numeric(p, s)

datetime

money

bit

image

IDENTITY

<b>taxRate</b>	Percentage	4.65%	Numeric(4,2)
<b>atomicWeight</b>	A very precise scientific measurement	28.0855	float
<b>customerID</b>	A value which is guaranteed to be unique	12	IDENTITY
<b>completed</b>	Yes or No	Yes	bit

### Question 3

Decide whether or not the following data items should be defined as **NOT NULL** – give reasons for your decisions. In each case, consider whether any additional **constraints** or **default values** might help to make sure that the data stored is valid.

**gender** in a *Persons* table  
 NOT NULL, IN 'M','F'

**discount** in a *Products* table (the value should be a percentage)  
 NOT NULL, BETWEEN 0 AND 100, DEFAULT 0

**dayOfWeek** in a *Shifts* table work schedule database  
 NOT NULL, IN 'Mon','Tues',....

**email** in a *Persons* table  
 NULL

**category** in a *DVDs* table  
 NOT NULL

**title** in a *Books* table  
 NOT NULL

**returnDate** in a *Loans* table in a library database  
 NULL, > loanDate

**returned** in a *Loans* table in a library database  
 NOT NULL, DEFAULT NO

**numberOfSides** in a *Shapes* table  
 NOT NULL, > 0

**advisor** in a *Students* table  
 NULL

**rating** in a *Responses* table in a survey database  
 NULL, BETWEEN 1 AND 5

### Question 4

Identify a suitable primary key for each of the following tables. In each case, write down a row of new data which would be **allowed** by your choice of primary key, and a row which would **not** be allowed.

Persons				
firstname	lastname	email	jobtitle	
John	Smith	jsmith@example.com	manager	
Sue	Wilson	swilson@example.com	manager	
Muhammad	Rafiq	mrafiq@example.com	engineer	
Jane	Lee	.	engineer	
Sue	Wilson	swilson2@example.com	administrator	
Tim	Jones	tjones@example.com	administrator	

Hotels				
hotelName	town	address	rating	
Holiday Lodge	Worcester	1 First Street	3	
Sea View Hote	Morecambe	2 Second Street	2	
Northern Star	Aberdeen	3 Third Street	3	
Best Eastern	Perth	4 Fourth Street	4	
Holiday Lodge	Perth	5 Fifth Street	3	
Best Eastern	Aberdeen	6 Sixth Street	5	

Bookings				
roomNumber	bookingDate	rate	customer	
12	12/10/2007	£45.00	23	
11	16/10/2007	£45.00	9	
12	13/10/2007	£45.00	25	
12	14/10/2007	£45.00	25	
12	15/10/2007	£45.00	25	
7	13/10/2007	£65.00	9	
7	17/10/2007	£55.00	23	
7	18/10/2007	£55.00	23	

Accounts				
accountNun	accountType	customerID	branchID	balance
00665544	current	4	99-10-65	£345.00
00665549	current	6	99-10-65	-£20.50
00665551	savings	4	99-10-65	£1,200.00
00665557	savings	10	99-10-67	£2,500.00
00665559	current	12	99-10-67	£12.76

**Persons:** should create ID field as no existing fields are suitable (names may not be unique, email can be NULL)

**Hotels:** (town, address) or create ID field

**Bookings:** (roomNumber, date) or create ID field

**Accounts:** accountNum

**NOTE:** these are all suggested solutions. There may be other valid answers in some cases in Q2,3 and 4