

TUTORIAL 5: Normalisation

Before they had their system properly designed, GCUTours got their 'IT Guy' to put together a database. After all, how hard could it be to put a few tables together?

IT Guy didn't really know about database design, so he made a bit of a mess of it. In this tutorial you will look at some of his work. You'll think about what he did wrong and about how to fix it.



Question 1

Here's IT Guy's first attempt at a table to store data about holiday **packages**, shown with some sample data:

Packages(packageID, location, name, description, price, departureDates)

packageID	location	name	description	price	departureDates
1	USA	Western	A typical tour is o	£1,499.00	1/3/2008,5/6/2008,2/9/2008
2	Asia	Roof of the World	New this year is c	£1,599.00	1/3/2008,5/6/2008
3	Europe	Alpine Action	There is adventure	£899.00	1/3/2008,2/9/2008,2/10/2008,3/11/2008

1. Write an SQL query which will find all holidays with a departure on 5th June 2008.
2. Try writing a query which will list all departure dates and locations – can you do it?
3. Summarise the problems that this table design can cause

IT Guy tried to design this table again:

Packages(packageID, location, name, description, price, departureDate1, departureDate2, departureDate3, departureDate4)

packageID	location	name	description	price	departureDate1	departureDate2	departureDate3	departureDate4
1	USA	Western Adventur	A typical tour is o	£1,499.00	01/03/2008	05/06/2008	02/09/2008	
2	Asia	Roof of the World	New this year is c	£1,599.00	01/03/2008	05/06/2008		
3	Europe	Alpine Action	There is adventure	£899.00	01/03/2008	02/09/2008	02/10/2008	03/11/2008

1. Write an SQL query which will find all holidays with a departure on 5th June 2008
2. In what ways is this better? Is it worse in any ways?
3. Write descriptions, in the TableName(fieldnames...) notation, of the tables required to get this into 1NF.

Question 2

IT Guy figured that he needed a table to store **bookings**, so he came up with this:

Bookings(departureDate, name, username, firstname, lastname, numberOfPersons)

departureDate	name	username	firstname	lastname	persons
01/03/2008	Western Adven	mpolo	Marco	Polo	2
01/03/2008	Western Adven	vdagama	Vasco	daGama	4
05/06/2008	Borneo Explore	mpolo	Marco	Polo	1
05/06/2008	Western Adven	ferdy	Ferdinand	Magellan	5
05/02/2008	Colorado Winte	ferdy	Ferdinand	Magellan	3

1. List the functional dependencies in this table.
2. Why is this table not in 2NF?
3. Write descriptions, in the **TableName(fieldnames...)** notation, of the tables required to get this into 2NF.

Question 3

IT Guy's solution to the problems in Question 1 was a table where each row in the table represents a **tour** departing on a specific date. GCUTours management then said that the database needed to store discount information for each departure date. This was OK - IT Guy just had to add a new field to the Tours table:

Tours(tourID, departureDate, location, name, description, price, offer)

tourID	departureDate	location	name	description	price	offer
1	01/03/2008	USA	Western Adventure	A typical tour is ou	£1,499.00	15
2	05/06/2008	USA	Western Adventure	A typical tour is ou	£1,499.00	0
3	01/03/2008	Asia	Roof of the World Tour	New this year is ou	£1,599.00	20
4	01/03/2008	Europe	Alpine Action	There is adventure	£899.00	0
5	05/02/2008	USA	Colorado Winter Adventure	When winter calls,	£1,099.00	10
6	05/06/2008	Asia	Borneo Explorer	A 15 day safari ex	£1,699.00	5
7	05/06/2008	Asia	Roof of the World Tour	New this year is ou	£1,599.00	15

1. List the functional dependencies in this table.
2. Is this table in 2NF? How do you know?
3. Why is this table not in 3NF?
4. Write descriptions, in the **TableName(fieldnames...)** notation, of the tables required to get this into 3NF.