



DUBLIN INSTITUTE OF TECHNOLOGY

**DT211C BSc. (Honours) Degree in Computer Science
(Infrastructure)**

Year 3

DT228 BSc. (Honours) Degree in Computer Science

Year 3

**DT282 BSc. (Honours) Degree in Computer Science
(International)**

Year 3

WINTER EXAMINATIONS 2017/2018

DATABASES 2 [CMPU3010]

PATRICIA O'BYRNE
DR. DEIRDRE LILLIS
DR. DAVID MALONE - DT211C
DR. MARTIN CRANE – DT228/DT282

THURSDAY 4TH JANUARY

2.00 P.M. – 4.00 P.M.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION 1 AND TWO OTHERS.

THERE IS A SYNTAX SHEET ON THE LAST PAGE TO ASSIST YOU

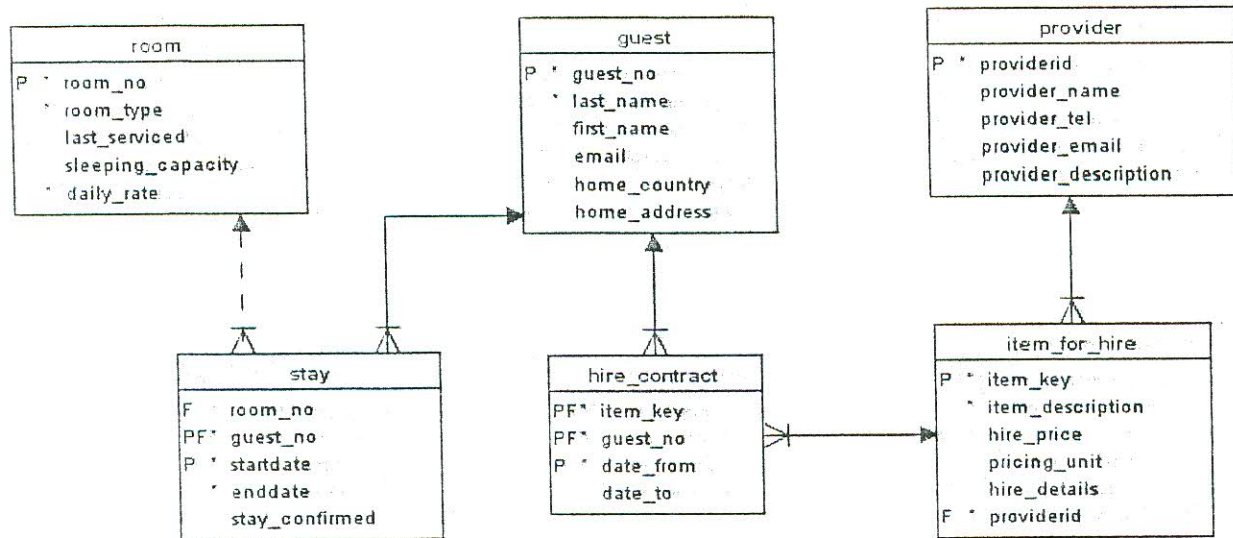


Figure 1 Case Study 1 Guest House

A guest house in the Shannon Estuary provides accommodation for visitors, especially those interested in fishing. Guests from around the world come to stay. The rooms are single, double, twin or family rooms. During their stay, many guests take the opportunity to fish. Depending on what type of fishing they want to do, they may need to hire equipment. The guest house allows guests to set up hire contracts with providers that will take place during their stay.

The guest house has an online booking system on its web page, where the general public can see the type of rooms that are available and can also check availability for a date range. They can also look up the resources that are for hire and the providers' details. The general public can also book a stay on the system. When booking their stay, guests must provide an address and may also provide a home country. When a booking is made, the stay is added without being confirmed (stay_confirmed is null). The owners update the stay when payment has been arranged. The owners can add, update and delete rooms, providers and items for hire. Confirmed guests can make a contract (hire_contract) to hire an item (item_for_hire) during their stay by picking an item and entering the date_from and date_to, and their guest number (guest_no). Providers can add, update and delete items for hire and hire_contracts.

1. (a) In relation to the Entity Relationship Diagram (ERD) and description of the guest house system shown in Figure 1, copy the table below into your examination script and fill in the boxes with permissions that each type of user has over the tables: (7 marks)

	Public	Owner	Provider	Guest
guest				
hire_contract				
item_for_hire				
provider				
room				
stay				

- (b) Write SQL statements to fulfil the following queries:
- (i) How many guests are confirmed as staying on 5th Jan 2018? (7 marks)
 - (ii) Which guests (last_name and first_name) have made a contract (hire_contract) to hire items provided by the provider named Paddy Joe Flanagan after 1st Jan 2018? (7 marks)
 - (iii) Which providers (give providerid and provider_Name) are not providing any item_for_hire? (7 marks)
- (c) One of the suppliers has provided a supply list as show in Figure 2. All entries have a serial number and a name. Some are for sale and some are for rent. Some have a description and there are some comments. How would you store this data in a MongoDB collection, or set of collections, for the use of the guest-house owner? (12 marks)

Jack's fishing supplies, 23 Main Street. Telephone:090111111

WEL2000, Wellington Boots, For Sale, €10 - €50, For Hire, €5/day, Check availability, An assortment of sizes and colours

GAR1000, Windbreaker, For Sale, €50 - €150, An assortment of thickness, colours and sizes

BAG1000, Waterproof bag, For Sale, €60

COO1000, Portable cooler, For Hire, €50/day, Check availability

BOA1000, Fish Finder, For Hire, €40/day, Check availability, Shows where fish are

BOA2000, Life Jacket, For Sale, €90, For Hire, €30/day, Check availability, Comes in assorted sizes

FIS1000, Assorted tackle, For Sale, €200

FIS2000, 7 foot Boat Rod and Reel, For Sale, €200, For Hire, €30/day, Check availability, Accessories not included

FIS2000, 8 foot Boat Rod and Reel, For Sale, €250, €35/day, For Hire, Check availability, Accessories not included


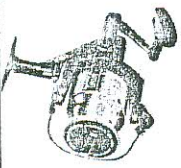


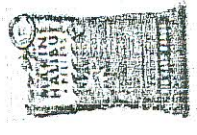



I've only got 2 of item WEL1000 left. I'm getting a new order in on Friday 12th June. I'll do a special offer of 10% off for anyone who gets a windbreaker, wellies and a waterproof bag.

Figure 2 Supplier's informal supply list (for use in Question 1(c)).



Angling Direct
Specialist in all your fishing

AUTUMN SALE Monthly Catalogue: October 2017 Site: UK and Ireland

							
<i>Delkim Rx Plus Pro Mini Receiver</i>	<i>Daiwa Tournament SS2600 Whisker Reel</i>	<i>Fox A Pod Plus</i>	<i>Daiwa Tournament-S Reel</i>	<i>Dynamite Baits Marine Halibut Pellets</i>	<i>Dynamite Baits Marine Halibut Pellets</i>	<i>Daiwa Mission CarryAll</i>	<i>Daiwa Mission CarryAll</i>
1 size	1 size	1 size	1 size	8mm, 300g	10mm, 900g	40L	70L
Our price: £139.50	Our price: £99.99	Our price: £49.50	Our price: £249.99	Our price: £249.99	Our price: £249.99	Our price: £32.50	Our price: £104.50
5 stars from 143 reviews	4.8 stars from 105 reviews	4.5 stars from 9 reviews	5 stars from 1 review	Be the first to review	Be the first to review	Be the first to review	4.2 stars from 7 reviews
Delkim Ltd, P.O. Box 270, Bedford, England.	D Daiwa Sports Ltd. Netherton Ind. Estate, Wishaw, ML2	1 Myrtle Road Brentwood Essex CM14 5EG.	Daiwa Sports Ltd. Netherton Ind. Estate, Wishaw, ML2	Dynamite Baits Ltd., Surrey, England	Dynamite Baits Ltd., Surrey, England	Daiwa Sports Ltd. Netherton Ind. Estate, Wishaw, ML2	Daiwa Sports Ltd. Netherton Ind. Estate, Wishaw, ML2
www.delkim.co.uk	https://www.daiwasports.co.uk	www.foxint.co.uk/	https://www.daiwasports.co.uk	https://dynamitebaits.com	https://dynamitebaits.com	https://www.daiwasports.co.uk	https://www.daiwasports.co.uk

Orders placed here will only be delivered to the UK and Ireland.

Figure 3 Sales Catalogue, October, UK and Ireland (for use in Question 2).

2. Angling Direct has a worldwide business selling fishing gear. It has sites around the world that deliver goods to a localized area. Each site has its own pricing structure and delivery rules and produces a catalogue once a month, for that month. The image shown here is a fictional one from the UK and Ireland site for the month of October. Each product has a name and size. The same product can come in different sizes, but a product can only come from one manufacturer. The manufacturer's address and website is shown in the image. Using the Sales Catalogue in Figure 3,
- (a) represent the information in unnormalized form (5 marks)
 - (b) represent the information in first normal form (5 marks)
 - (c) represent the information in second normal form (5 marks)
 - (d) represent the information in third normal form (5 marks)
 - (e) Draw a fully normalized ERD to represent the entities derived by the normalization process, showing primary and foreign keys, attributes and relationships. (10 marks)
3. (a) Write a SQL query to list the first and last names of guests who have made contracts (hire_contract) to hire all the items_for_hire on offer by the provider named "Paudie Houricane". (10 marks)
- (b) Write a SQL query to list the first and last names of guests who have booked a stay (stay) in a double room (Room_type = 'D') and have never made contracts (hire_contract) to hire any items. (10 marks)
- (c) Write a SQL query to list the number of stays and number of times each guest hired an item. If a guest did multiple hires during one stay, each hire can be counted separately. Please ensure that guests who did not hire any equipment are still counted. (10 marks)
4. Write PL/SQL to allow a guest to set up a hire, ensuring that the guest is staying in the guest house for the hire period. The guest must enter the item_key, start and end dates and also his / her guest_no. A confirmation message should show the guest's name and the item description, as well as the start and end dates. (30 marks)

SQL

```
SELECT column-list FROM tablename
[WHERE condition]
[ORDER BY column-list]
[GROUP BY column-name]
[HAVING condition];
SELECT column-list FROM join-
expression
```

```
Join-expression =
table1 JOIN table2 ON condition |
USING (column-list)
table1 LEFT JOIN table2 ON
condition | USING (column-
list)
```

Conditions : =, >, <, >=, <=, <>

BETWEEN .. AND., IN (list),
IS NULL, LIKE

Logical operators: AND, OR, NOT

Set operations: UNION, INTERSECT,
MINUS

```
INSERT INTO tablename [{column-
name,}] VALUES (data-value-
list)
```

```
UPDATE tablename
[SET column-name= <data-value>]
[WHERE condition]
```

PL/SQL_BLOCK

```
DECLARE
[constant/variable declarations]
BEGIN
[Executable statements]
RETURN Return value
[EXCEPTION
exception handlers]
END;
```

Exceptions:
DUP_VAL_ON_INDEX
NO_DATA_FOUND
TOO_MANY_ROWS

Error variables:

SQLCODE – gives error code

SQLERRM – gives error message.

MONGODB EXAMPLES

Create a products collection:

```
db.createCollection("contacts",
{validator:{ $or:[
{phone:{ $type:"string"}},
{email: { $regex: /@mydit\.ie$/}},
{status:{ $in:["Unknown","Incomplete"]}}
]}})
```

Insert a document with _id value 11 into products collection:

```
db.products.insert(
{ _id: 11, item: "pencil", qty: 50, type:
"no.2" },
{ item: "pen", qty: 20 },
{ item: "eraser", qty: 25 }
])
```

Attributes may contain embedded documents or arrays.

<Embed_attrrib_name>: [{set of embedded attributes}]

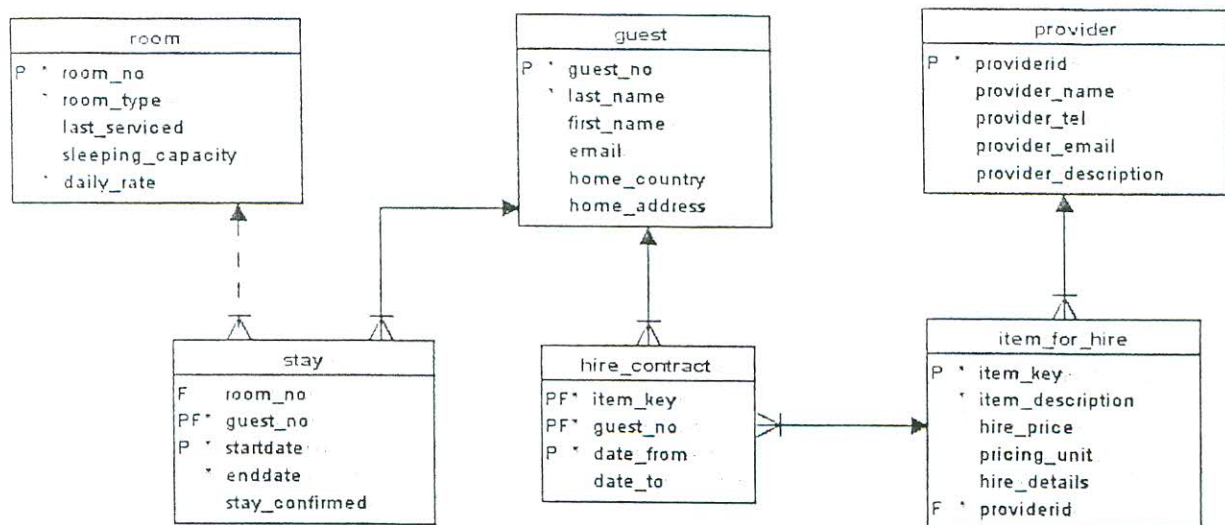


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