# Unit:
# Database Design and Development

# Assignment title:
# Rupert Roof Conversions

# December 2015 –Sample Assignment

## Important notes

- Please refer to the *Assignment Presentation Requirements* for advice on how to set out your assignment. These can be found on the NCC Education website. Click on 'Policies & Advice' on the main menu and then click on 'Student Support'.
- You must read the NCC Education documents *What is Academic Misconduct? Guidance for Candidates* and *Avoiding Plagiarism and Collusion: Guidance for Candidates* and ensure that you acknowledge all the sources that you use in your work. These documents are available on the NCC Education website. Click on 'Policies & Advice' on the main menu and then click on 'Student Support'.
- You **must** complete the *Statement and Confirmation of Own Work*. The form is available on the NCC Education website. Click on 'Policies & Advice' on the main menu and then click on 'Student Support'.
- Please make a note of the recommended word count. You could lose marks if you write 10% more or less than this.
- You must submit a paper copy and digital copy (on disk or similarly acceptable medium). Media containing viruses, or media that cannot be run directly, will result in a fail grade being awarded for this assessment.
- All electronic media will be checked for plagiarism.

# Introduction

This assignment contains four parts: design, data and queries, derived data and an evaluation. All parts of the assessment relate to the *Rupert Roof Conversions* scenario below.

# Scenario

*Rupert Roof Conversions* is a company based in London, in the United Kingdom. They specialise in turning attics in houses into habitable rooms. Jobs vary between simply fitting floorboards to full conversions with dormer windows, electrical fittings and staircases. When a customer contacts *Rupert Roof Conversions* for an initial quote and estimate, the job they want is classified by job type. One or more workers will be assigned to the job. Each job will be allocated equipment and materials. Jobs are charged at a rate determined by the job type and how many days are needed to complete the job.

**Note:** The data shown in the assignment is not necessarily normalised – it is your task to organise the data in the most optimal way possible. For example, the paper records shown below will not necessarily map directly to database tables. You are expected to use these tables as a starting point for your own normalisation and optimisation of the Rupert Roof Conversions data.

**You should show all SQL scripts along with their results.**

Below are samples of the paper records currently kept by the company:

**Initial Job Sheet at outset of a job**

| Job ID | Customer Name | Address | Job Type | No. of days | Materials Used |
|--------|---------------|---------|----------|-------------|----------------|
| 28434 | Jay Davidson | 345 High Street, Brockley, London, SE16 U77 | Full Conversion | 8 | 80 x standard floor boards, 3 x power points, 20 metres standard electrical wiring, Standard stairs pack |
| 29000 | Charun Jutley | 45 Church Street, Nunhead, London, SE15 2BQ | Semi Conversion | 2 | 50 x standard floor boards, 1 x power points, 10 metres standard electrical wiring |
| 28501 | Colin Clark | 67 Robins Avenue, Homerton, London, E9 REE | Floor Boarding | 2 | 50 x standard floor boards |
| 26982 | Naseema Khan | 1 Oleander Street, Islington, London, N1 QEE | Full Conversion | 6 | 100 x standard floor boards, 5 x power points, 40 metres standard electrical wiring, Standard stairs pack. |
| 23232 | Abdul Hasnath | 90 Togo Road, Walthamstow, London, E17 TYY | Semi Conversion | 2 | 50 x standard floor boards, 1 x power points, 10 metres standard electrical wiring |
| 27611 | Winston Kodogo | 32 Lavender Road, Leyton, London, E10 TR5 | Full Conversion | 7 | 60 x standard floor boards, 3 x power points, 20 metres standard electrical wiring, Standard stairs pack. |

**Staff on Job Record**

| Job ID | Staff Number | Name |
|--------|--------------|------|
| 28434 | S100 | Ronald Smith |
| 28434 | S801 | Muhammad Ya |
| 28434 | S20 | Curtis Stand |
| 29000 | S11 | Manny Sinclair |
| 29001 | S100 | Ronald Smith |
| 28501 | S801 | Muhammad Ya |
| 28501 | S100 | Ronald Smith |

**Rates of Pay by Job Type**

| Job Type | Daily Rate of Pay |
|----------|-------------------|
| Full Conversion | £100.00 |
| Floor Boarding | £75.00 |
| Semi Conversion | £90.00 |

This is an example of an invoice:

**Final Job Invoice**

Job No: 28501
Customer: James Strong, 23 Goring Street, Homerton, London, E9 YT5

Date of Invoice: 1 February 2014

Job Type: Floor Boarding

**Staff allocated:**

S801  Muhammed Ya
S100  Ronald Smith

**Equipment / Materials**

50 x standard floor boards

**Costing**

| Job Type | Rate | No of Days | Subtotal |
|----------|------|------------|----------|
| | £75 | 2 | £150.00 |
| | | | **VAT @ 20%:** £30 |
| | | | **Total:** £180.00 |

## Task 1 – Design (40 Marks)
a) Produce an entity relationship model for the proposed database system for Rupert Roof Conversions. This should be a fully normalised model to third normal form (3NF).
b) Produce a data dictionary for the entity relationship model.


## Task 2 – Data and Queries (32 Marks)
a) Create all the tables using SQL. Show your Create scripts and the finished tables.
b) Produce data on all the jobs and the details of those jobs. Give a listing of this.
c) Produce data for the members of staff including those listed in the scenario. Assign staff to jobs. Give a listing of this.
d) Produce data on the materials that are used on a job. Give a listing of this.
e) Write a query that selects all the jobs and which staff have worked on them.
f) Write a query that selects the materials that have been used on jobs of type 'Full Conversion'.
g) Write a query that selects all the jobs that Muhammad Ya has worked on.
h) Write a query that shows all jobs that have taken place in addresses that contain 'SE15' or 'SE16'.
i) Write a query that counts the number of jobs that have used electrical wiring.
j) Write a query that produces the output that could be used to prepare an invoice. This should include a calculation for VAT charged on a job (calculated at 20% of total cost of the job).
k) Update the daily rate of pay for a Full Conversion to £120.00.


## Task 3 – Derived Data (13 Marks)
The company have said they would like to change the way they charge for jobs. As well as charging per day by job type they want to charge for each piece of equipment they use and how much of a particular material they use. How would the database need to be altered to take account of this? How would the company go about deriving a full invoice for a job that could include this information? You should include an outline of how you would derive it using SQL and specify the method of implementing it.


## Task 4 – Evaluation (15 Marks)
Give an evaluation of how the work you have done has met the requirements of the firm. This should include data storage and applications. You should also discuss how you have standardised the company's data.


## Submission requirements
- Your submission should be in the form of a single word-processed document that includes any necessary diagrams.
- The word count for the document is **1250 words** (excluding text in any diagrams). You should explain any assumptions you have made.
- A digital version must be submitted on a CD, USB flash drive or other similarly acceptable medium, **along with a copy of the developed database**.

# Candidate checklist

Please use the following checklist to ensure that your work is ready for submission.

Have you read the NCC Education documents *What is Academic Misconduct? Guidance for Candidates* and *Avoiding Plagiarism and Collusion: Guidance for Candidates* and ensured that you have acknowledged all the sources that you have used in your work? ❑

Have you completed the *Statement and Confirmation of Own Work* form and attached it to your assignment? **You must do this.** ❑

Have you ensured that your work has not gone over or under the recommended word count by more than 10%? ❑

Have you ensured that your work does not contain viruses and can be run directly? ❑