## ICT @ Brooke Weston Academy

Unit 06 (AO1) – Advanced Databases

**Design a relational database to meet the needs of an organisation**

**Scenario**

Cube Systems have been very successful with their sales of customised computers and software. This has resulted in the need to store large quantities of data and produce a variety of well structured reports. Knowing the power of Relational Databases to store the large amounts of data and produce reports, they have decided to develop a Relational Database for their customers and sales.

REMEMBER:

* Customers choose the configuration of computer based on multiple choices such as the speed of the processor, size of the RAM, monitor or hard drive and software.
* Certain options do attract discounts and customers have delivery options such as next day, 2 day or 4 day which all have different price points – if the customer spends over a certain price point they will get free delivery.

Cube systems would like a fully functional and automatic Relational Database system which could incorporate:

* ***A customer page*** – where customers can be added, edited and viewed
* ***A customer orders page*** – where customer orders can be viewed
* ***A product page*** – where all the products for sales can be added, edited and viewed
* ***A ordering page*** – where all the orders can be added, edited and viewed
* ***A invoice page*** – where the user selects what the customer requires and prints the invoice
* ***A reporting page*** – where reports such as the analysis of:
  + Orders of any particular product
  + Profit made on each product
  + Tracking of customer orders and purchases
  + Calculating totals of ordered product over a given period
  + Customers traced based on any other information required

Focusing on the needs of Cube Systems for a database system to manage the sales/orders, you need to provide evidence for the following **8** tasks within this case study:

* 1. Purpose and Audience
  2. Database Activities
  3. Normalisation
  4. Data Dictionary
  5. Entity Relationship Diagram (ERD)
  6. User Interface
  7. Forms
  8. Reports

Basically, you need to:

**Introduction**

1. What is this case study about?

**Purpose of a Database - *(Task 1)***

1. You need to **explain** that you have **understood what the purpose** of the ***new Relational Database system*** is and the **audience who will be using it**.
   * You should detail ***exactly what*** the ***database needs to do***.
   * Think about **who the audience is**, what **skills do they have**, what **assistance will they need** in order to use the database.
   * For **Merit and Distinction** – These **descriptions** must be clear and detailed.

**Main Investigation**

**Database Activities - *(Task 2)***

1. **Describe exactly** how the **Relational Database** is ***going to work***. Explain **all** the ***inputs***, how these are going to be ***processed*** and what ***outputs*** there will be.
   * This could be performed within a table.
   * Before you begin the database CUBE’s CEO must see a detailed plan of the proposed system
   * REMEMBER – The database system will contain **at least** three separate tables

**Normalisation**

For further information concerning normalisation and examples of how to normalise refer to ***“Unit 06 – AO1 – Normalisation”*** and ***Unit 06 – AO1 – Database Notes”***

**Unnormalised Dataset**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Order No | Date | Title | First Name | Surname |
| Address | Town | County | Post Code |  |
| CPU | Hard Drive | Monitor Type | Software | Delivery Price |
| RAM | Graphics | Monitor Size | Quantity |  |

1. ***(Task 3)*** – Briefly explain **what Normalisation is** and ***why it is beneficial to perform it***
2. ***(Task 4)*** – Using the unnormalised dataset, normalise to the **3rd Normal Form**, showing all the entities (tables) and attributes during each stage
   * You should have a **minimum** of **three** tables.
   * **Explain and justify *any changes* made *during the 3 stages***

**Data Dictionary - *(Task 5)***

1. Develop a data dictionary for the tables identified from the **3rd Normal Form (Task 4)**
   * Ensure you cover the following areas:
     + Primary Key
     + Indexing column
     + Validation Rules
     + Input Masks
     + potential problems and justify how your design may solve these issues

**Entity Relationship Diagram (ERD) - *(Task 6)***

For further information concerning ERD and examples refer to *“****Unit 06 – AO1 – Normalisation”*** and **“*Unit 06 – AO1 – Database Notes”***

1. Produce an Entity Relationship Diagram for the Relational Database

**Designs for User Interface, Forms & Reports**

* Remember to annotate all your designs
  + Include colours, company logo, etc…
  + Refer to the Database Activities (Task 2) to design the reports for any outputs that are produced, both printable and on screen

1. *(****Task 7)* –** Design a user interface to access parts of database
2. *(****Task 8)* –** Design a variety of forms for adding and amending data within the Database
3. *(****Task 9)* –** Design a variety of reports for both printed / onscreen
   * Remember to specify which are printed and which are on screen