# 1. REVISON week 1

## Revision Test 1 [work in groups]

1. What is an entity?

a) An object b) an array c) a class

2. What is appropriate naming for an entity

a) In singular form b) in plural form

3. Which of the following is not an entity?

a) Student b) Priestley c) Computer d) student\_phone\_number

4. Which of the following is not an attribute?

a) venue\_id b) car c) picture\_name d) date

5. Which of the following are attributes of an entity called Customer?

a) customer\_name b) address c) order\_date d) delivery\_date

6. Which of the following is an appropriate identifying attribute?

a) customer\_name b) customer\_email c) customer\_id

7. Which of the following statements is correct?

1. An entity can have only one occurrence
2. An entity must have more than ONE occurrence

8. When identifying an entity type in the text you look for

1. Verb b) noun c) adjective

9. Which of the following below is not an occurrence?

a) Sanela Lazarevski b) Venue c) 22222 d) Booking

10. When drawing an ERD you should immediately identify cardinality of the relationships?

a) True b) False

11. When deciding the cardinality you base it on the information in the text.

a) True b) False

12. Relationships on an ERD normally don’t have a name.

a) True b) False

13. Choose cardinalities that can be defined on the relationship.

a) 1:M b) 1:1 c) M:N d) M:1

# Task 1: Leeds Music Festival

### Aim – research into existing Music Festival websites to identify requirements for your dbms.

Leeds in well known to be popular with music and festivals. You have been asked to produce a system that will cater for a Spring music festival in Leeds. This festival is unique as the venues are of a different size and types, such as SU bars, or small café such as Lento in Headingley.

Get in groups of three and consider all important data that we would need to store in a database, to support multiple users of the festival from knowing where each band is playing to the number of tickets that can be on a sale for a particular gig.

Try to list around 10-15 requirements (defining the rules) that you as a team may think of. Note that we are interested in data that will be stored on our system, not the way data is processed abound the system.

**Activity 20-30min.**

**Task 2:**

Below are given entity names, attributes and occurrences. Your task is to complete the table below, and specify if given words are attributes, identifiers and/or an entity name. If it’s an occurrence, only highlight it with a circle on the list with a note of which attribute it’s an occurrence.

These attributes, entities, and occurrences described as a part of sales department database design record’s for full time and part time sales staff, who work on shifts. Each member of staff is expected to attend an induction course such as First Aid and many other relevant courses. All sales staff has to have a driving licence, and each full time sales is assigned a car. Each department has a number of jobs allocated.

Work in pairs. You’ve got 15min for this task. When you finish exchange your work in class to mark each other’s work any. Good luck! I am sure you will enjoy this tutorial.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MOT\_expiry | | date\_of\_birth | vehicle | make | reg\_no | F654DWR |  |  |
|  |  | employee | | model |  | citroen |  |  |
| forename | |  |  |  | shift |  | shift\_date |  |
| surname | | address\_line1 | |  |  |  |  |  |
|  | dept | address\_line2 | | hours | job |  | gender |  |
| First Aid |  | tel\_moblile | course | rota |  |  |  |  |
| job\_id |  | ~~date\_completed~~ |  | day |  | ethnic\_group | |  |
| job\_description | ~~course\_name~~ | | ~~Course\_id~~ |  |  | registered\_disabled | | |
| Transport | Induction | Employee\_id | | dept\_name | dept\_id |  |  |  |

1. List your Entities and Attributes in the table:

(Occurrences not specified in table, these should be used as reference for the relationships on the ERD in task b):

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Entity Name** | **Identifier** | **Attribute** | **Attribute** | **Attribute** | **Attribute** | **Attribute** | **Attribute** | **Attribute** |
| *COURSE* | *Course\_id* | *Course\_name* | *Date\_completed* |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

1. Draw your ERD below, and specify your assumptions and 4 validation questions for your ERD:

(Example of a validation question: *Which shifts did John Campbell work on in the past two months?* To be able to answer this question we will need entities employee and shift, which would hold attributes such as employee name, and shift\_date)

Exchange work and review each other’s *(this is optional…used only if tutorial done in class)*

This work is:

Excellent Pretty Bad

Why is it good/bad?

How could it be improved?

This may help when you review the ERD(similar marking schema is used in your assignment for the ERD task)….

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Task 1 | 1st | 2.1 | 2.2 | 3rd | Fail |
|  | Excellent deployment of extended modelling skills, with complete and accurate coverage of advance entity models, cardinality, optionality, relationship naming in accordance with requirements, including appropriate support of sample queries. | Mostly accurate entities identified need to address requirements with correct cardinality. Some advance models included. Relationship names specified. | Partly addressed all issues on the model, with errors in relationships naming, cardinality and wrong appliance of one advance entities models. | Requires further work to address errors in relationships naming, cardinality and incorrect appliance of advance models. | Omissions or inaccuracies in model, showing lack of understanding of extended modelling approaches. |

Produce an ERM for each of the following situations. On the ERD diagram be sure to label and identify the cardinality and optionality of each relationship.

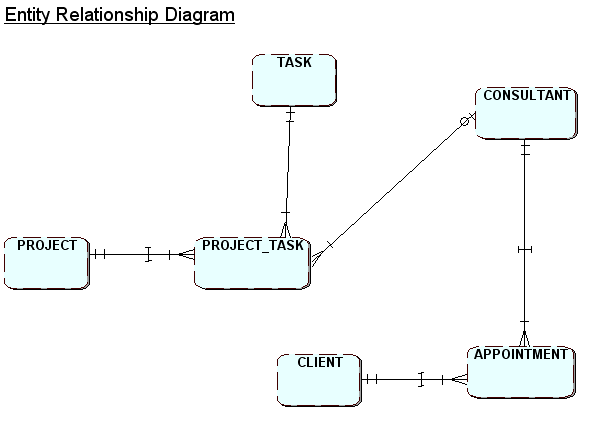
**Task 3:** Logical Design – Revision

Derive this model fully, by defining ***foreign keys*** for the relevant tables.

Below is the ERD’s description:

*Every project requires a number of employees. It is usual for consultants to work on more than one project at a time. Each project is broken down into individual tasks which are allocated to specific consultants. Some tasks are common to any project. Consultants meet regularly with clients by making appointments with them.*

Note: When you are completing the task to derive keys from your ERD, no retrospective changes should happen to the ERD design.



**Derived Tables following Relational Data Model(RDM) rules**

**Step 1: Identify Relations/tables and attributes**

**Step 2: Identify Primary key(s) for each relation/table**

**Step 3: Derive Foreign Keys following the RDM rules**

Steps 1 and 2 have already been completed for you below.

Step 3:

Task(Task\_id, Task\_Name,…

Project( Project\_id, Project\_StartDate, Project\_EndDate,…

Project\_Task(PT\_id, Desc,…

Consultant(Consultant\_id, Name, Address, Phone,…

Client (Client\_id, Name, Address, Phone,…

Appointment(Appointment\_ref, Date, Location,…

* **In which normal form is this model?**

**Task 4:** Medical Practice

In a group medical practice each doctor has many patients registered but a patient can only register with one doctor. Doctors may exist within the group that have no registered patients e.g. if they are involved only in research, but each patient must be registered with a doctor.

Step 1: Underline all nouns in the text above and list them below:

Step 2: Ask yourself, is your noun

* an attribute of an entity, or
* an occurrence of an attribute or
* An entity, which would have more than ONE occurrence and it is relevant to our system (case study)

Step 3: List below your entities and check your final list with your tutor

Step 4: For each entity create a table defining attributes and occurrences

Example: Entity Name

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| attributesName |  |  |  |  |  |  |  |  |
| Occurrences |  |  |  |  |  |  |  |  |
| Occurrences |  |  |  |  |  |  |  |  |

Step 5: Draw your ERD, by defining entities, relationships, relationship names cardinality. [How would your ERD change if past registrations are included?]

**Task 5: GP Practice**

New patients arriving at the practice are registered at the reception. In order to complete the registration, a patient’s personal details are recorded (name, address, previous doctor, etc.), and they are allocated to one of our GPs. Allocation to doctors is made on a monthly basis, e.g. in May all new patients are allocated to Dr Brown.

At consultations, which may be at the surgery or at the patient’s home, the patient is examined by a GP (who may or may not be that patient’s allocated GP). A record of all consultations is maintained, along with details of all drugs prescribed for the patient.

A dispensary operates at the surgery for the dispensing of the more common drugs and medicines. Patients present their prescriptions to the dispensing officer who checks the drug formulations before making up the prescription and attaching dosage instructions. Several items may be listed on a prescription, each item referring to a specific drug and the quantity of that drug that is to be dispensed.

Step 1: Underline all nouns in the text above and list them below:

Step 2: Ask yourself, is your noun

* an attribute of an entity, or
* an occurrence of an attribute or
* An entity, which would have more than ONE occurrence and it is relevant to our system (case study)

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Example: Entity Name

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| attributesName |  |  |  |  |  |  |  |  |
| Occurrences |  |  |  |  |  |  |  |  |
| Occurrences |  |  |  |  |  |  |  |  |

Step 5: Draw your ERD, by defining entities, relationships, relationship names cardinality.

**Revision Notes**

When analysing provided text (requirements) ask yourself is this “noun” (word) an attribute, or an entity or an occurrence?

What is an entity?

An **Entity**is a thing (object, concept) which the enterprise recognises as being capable of an independent existence and which can be uniquely identified. An entity is an entity if it would have more than two occurrences.

Entity examples: **Customer Employee Machine Reservation**

What is an attribute?

An **attribute** is a property of an entity.An identifier is an attribute that uniquely identifies an occurrence of an entity

For example

* + Attributes of *Customer* might be: **customer#, customer-name**
  + Attributes of *Machine* might be: **machine#, location**

When defining attributes for an entity it should be the attributes that describe that particular entity. For example, attribute customer name is only in customer entity, even though a customer makes an order, we do not need to have a name in order. Same applies to Order Date; it will be only in Order entity.

What is an Occurrence?

An **occurrence** is an actual example of a particular entity type, a real-life instance of that entity

For example, possible *occurrences* of the entity employee could be:

|  |  |  |  |
| --- | --- | --- | --- |
| Empno | Ename | Eaddress | DOB |
| 111 | Sanela | OtlayRd | 22/3/70 |
| 222 | Jackie | Beckett | 22/2/75 |

**The definition of a Relationship:** A ***relationship*** is an association between two entities

For example

* + Employee may be *associated* with Department via the *relationship* Works For
  + Employee Works For Department

**Summary of the top-down process [producing an Entity Relationship Model (ERM)]**

Creating a complete Conceptual model for a Relational Database involves the following steps:

1. Identify a preliminary list of entities.

2. Name each entity (and possibly choose an identifier (primary key)).

3. Identify some essential attributes for each entity.

4. Describe each entity and in particular identify its function and context.

5. Identify linked or dependent pairs of entities i.e. those to be connected by a relationship or relationships.

6. Decide which “active” entity or entities will be put at the centre of the ER diagram.

7. Create a preliminary ER diagram just showing the expected relationships.

8. Define the cardinality, optionality and name of each relationship.

9. Draw the purely conceptual ER diagram with appropriate advanced features.

10. Convert to a logical ER diagram by creating link entities where needed.