

# Tutorial - Week 3

## Objectives:

This tutorial will cover:

- I. Entity-Relationship (ER) modelling review
- II. Case study – Use a case study to design a conceptual model
- III. Convert the conceptual model to a logical model
- IV. Introduce the notion of physical model – **complete as homework**

## Exercises:

### 1. ER Review – selected concepts

**NOTE for students:** *This is a brief summary of selected concepts taught in lectures 3 and 4. The lectures contain detailed content related to these and many more key concepts. These notes should be considered quick revision instead of the sole resource for the course material.*

- Entity, weak entity
- Attribute
- Business rules to relationships – key constraints and participating constraints

### 2. Consider the following case study:

A cinema chain operates a number of cinemas. Each cinema has several theatres, numbered starting from 1. The chain keeps track of the size (in meters) and seating capacity of every theatre, as well as whether the theatre offers the Gold Class experience.

The cinema chain owns hundreds of movie projectors – both film projectors (16 mm and 35 mm) and digital projectors (2D and 3D). The cinema chain stores key information about each projector, namely its serial number, model number, resolution and hours of use. Each movie theatre has space for a single projector; technicians must be able to identify which theatre each projector is currently in use.

A wide range of movies are shown at these cinemas. The system should keep track of the last time a movie was shown in a particular theatre belonging to a particular cinema. The marketing department needs to know the movie's title and year of release, along with the movie's rating (G, PG, M, MA15+ or R18+).

Each cinema has a numeric ID, name and address. For cinemas that are not owned outright, the business also keeps track of yearly rent. The system needs to be able to generate weekly activity reports for the chain's chief operating officer.

3. TASK. Follow the steps to create a conceptual model in Chen's notation:
  - I. Identify the entities
  - II. Form relationships between entities.
  - III. Apply constraints (key constraints and participation constraints) to the relationships.
  - IV. Add attributes which describe the entities and relationships.
  - V. Finalise your conceptual model by marking weak entities, identifying relationships and key attributes.

## Logical and physical modelling

4. TASK. What needs to be changed to convert a conceptual design to a logical design?
5. TASK. Develop a logical design for the above case study.

*HINT: What will you change in the logical model to generate a physical model?*

## HOMEWORK

6. TASK. Using MySQL Workbench create a physical E.R. model of the case study.