

INFO20003 Tutorial – Week 3

Objectives:

This tutorial will cover:

- I. Entity-Relationship (ER) modelling review
- II. Case study – Use the previous week's case study to design a conceptual model
- III. Convert the conceptual model to a logical model
- IV. Introduce the notion of physical model

Exercises:

1. ER Review – fundamental concepts

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

2. Consider the following case study:

A cinema chain operates a number of cinemas. Each cinema has several screens, numbered starting from 1. The chain keeps track of the size (in feet) and seating capacity of every screen, as well as whether the screen 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 chain stores key information about each projector, namely its serial number, model number, resolution and hours of use. Each movie screen has space for a single projector; technicians must be able to identify which screen each projector is currently projecting onto.

A wide range of movies are shown at these cinemas. The system should keep track of the last time a movie was shown on a particular screen. 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.

Follow the steps to create a conceptual model in Chen's notation:

- a. Revise last week's identified entities. Cinema Screen Projector Movie
- b. Form relationships between entities.
- c. Apply constraints (key constraints and participation constraints) to the relationships.
- d. Add attributes which describe the entities and relationships.
- e. Finalise your conceptual model by marking weak entities, identifying relationships and key attributes.

3. Logical and physical modelling

- a. What needs to be changed to convert a conceptual design to a logical design? Develop a logical design for the above case study.
- b. What will you change in the logical model to generate a physical model?

电影院连锁经营着许多电影院。每个电影院都有几个银幕，从(开始编号。该链条跟踪每个银幕的大小(以英尺为单位)和座位容量，以及银幕是否提供黄金级体验。

电影院连锁拥有数百台电影放映机-电影放映机(16毫米和35毫米)和数字放映机(2D和3D)。该链存储有关每台投影机的关键信息，即其序列号，型号，分辨率和使用时间。每个电影院屏幕都有一个投影机的空间。技术人员必须能够确定每台投影机当前正在投影到哪个屏幕上。

这些电影院放映各种各样的电影。系统应跟踪上一次在特定屏幕上播放电影的时间。市场营销部门需要了解电影的标题和发行年份，以及电影的等级(G, PG, M, MA15+或R18+)。

每个电影院都有一个数字ID，名称和地址。对于并非完全拥有的电影院，该业务还会跟踪年租金。该系统需要能够为连锁店的首席运营官生成每周的活动报告。

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screens

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projector
且与screen有关系

=>
movies

=>
cinema