

# **CMSC 23500 — Introduction to Database Systems**

## **Discussion Session #1**

April 3, 2008

A long time ago, in a galaxy far, far away, the evil Galactic Empire began construction on its ultimate weapon, the Death Star, an armored space station with enough power to destroy an entire planet. This technological terror will store all its information in a relational database, and we have been asked to design an ER schema for it based on the following description of the station's data.

The Death Star employs a working force of over 200,000 (mostly) non-union workers. Each worker is identified by an Imperial Security Number (ISN), and also has a name, rank, and a security clearance. Workers can be officers, stormtroopers, gunners, station support staff, and pilots.

The station is divided into several levels, each identified by a level number. The database must keep track of a level's total surface area, storage capacity, and whether this is a restricted level or not. All levels have living quarters with capacity for multiple workers, and all workers are assigned living quarters in the station. Workers can also enter other levels of the station, provided they have been granted access to them. The database must record what levels each worker is authorized to access. Note that some levels may have no authorized workers (the Imperial DB Design Task Force is not at liberty to discuss why).

Some of the levels of the station have a cell block. Cell blocks are identified by a single letter that is unique within a level. Certain applications using the database require that we keep track of the maximum capacity of each cell block, and whether the cell block has a reactor or not. Cell blocks can host zero or more prisoners at any given time (we must keep track of the date of entry and the date of execution). Prisoners have a unique Prisoner ID, a name, and an affiliation.

Finally, to prevent unauthorized transfers of prisoners, the database must record all transfer orders. Transfer orders are carried out by a Death Star worker, and carry the prisoner's information and the new cell block the prisoner is being transferred to.