CSIT115 Data Management and Security

Database Design

Lecture 2

Glossary

Database Domain

- Part of the real world to be described by a database

Database Schema

- A blueprint of how the database is constructed
- There are different levels of abstraction (detail):
  - Physical, a low level representation of the database (files, indexes, clusters, partitions…)
  - Logical, a mid level representation (rows, columns, headers, tables…)
  - Conceptual, a high level representation, a map of concepts and their relationships. A conceptual schema is also referred to as a simplified class diagram.

Database design process

Database design follows a top down process, starting with the highlevel birds eye view of things, and working down into lower levels of abstraction to the technical details.

Object Modeling

Object modelling is a process where a specification of a database domain is transformed into a conceptual schema

- Contents of a database is abstracted into objects
  - A student is an example of a database object

- Objects are described by their attributes (properties) and operations (methods)
  - E.g. A students attributes could be: Student number, first and last name and DOB

- Objects are identified by a select attribute value
  - The student would be identified by their student number attribute

- A class of objects is a group of objects with common properties, semantics (meaning / purpose) and identifiers
  - A group of students form the class *STUDENT*

Object modelling key terms:

- Link: A conceptual connection (relationships) between objects
  - E.g. CSIT115 Lecture 1 is in building 3 room 2
  - Peter supplies bolts to James

- Association: A higher level link, connections between classes
  - *LECTURE* is in *BUILDING*
  - *SUPPLIER* supplies *PART* to *MANUFACTURER*

- Generalisation Hierarchy: Shows all levels of abstraction for a given class
  - E.g.