Dr Simon D'Alfonso

INFO 90002
Database Systems & Information Modelling

Week 01

Introduction to Subject

Introduction to Relational Databases and MySQL

Designing a database

Structure of today's lectures

- first hour: Introductions and admin
  - subject overview
  - staff and students
  - learning resources
  - assessment
- second hour: Introduction to databases and MySQL
  - database technology, past present and future
  - how databases are designed, implemented and used
  - client and server software
  - how to download and install
  - how to use in labs and at home
- third hour: Designing a database

Welcome!

- Welcome to INFO 90002
  Database Systems & Information Modelling

  Why this subject matters
  - database = key building block in many technology careers
  - database = one of the most widely-used technologies
    - embedded within most of the interesting ICT of today
      - social media, apps, websites, banking, scientific research ...
  - database have come to influence our culture
    - “The database is the major cultural form of the 21st century in much the same way as the novel was for the 19th and the film for the 20th. … While retaining the visual and temporal aspects of film, the modality of hypertext or of computer games eschews its linear modality for the modality of the database, in which objects are linked together but their assembly into a narrative experience is in the hands of the audience."
      Dourish and Mazmanian (2011), discussing Manovich (2002) *The Language of New Media*

What are employers looking for?

Forbes (IT)	Forbes (NACE)	AIIA	Youth Central (Generic)	Dept of Employment
SQL	Teamwork	Cross-Cultural Competency	Communication	(ICT Sector) Lack of;
Mentoring	Solve Problems	Social Intelligence	Problem Solving	Industry Knowledge
ORACLE	Make Decisions	Novel & Adaptive Thinking	Teamwork	Technical Skills
Collaboration	Communicate	Virtual Collab.	Learning	Other Soft Skills
Process Improvement	Plan, Organise, Prioritise	New Media Literacy	Initiative and Enterprise	Communication Skills
Business Devt.	Obtain and Process Info	Computational Thinking	Self-management	
Decision Making	Quantitative Data Analysis	Design Mindset	Planning and Organising	
Data Analysis	Technical Skills	Resilience	Technical Skills	
SAP	Influencing	Transdisciplinarity		

About the teaching staff

- Subject coordinators
  - Simon D'Alfonso, David Eccles and Farah Kahn
- Lab demonstrators
  - Imairi, Ibrahim, Nick, Kat, Andreas, Neven
- Student representative
  - (you? we are seeking a volunteer)
- Interacting with staff
  - in class
  - office hours: Tuesday from 2:30-4pm in room 7.02 of the Doug McDonell building
  - LMS discussion forum
  - email for *personal or highly individualised* questions only

About you

- Degrees people come from

Master of Information Technology
Master of Information Systems
Master of Data Science
Master of Engineering
Master of Science (Bioinformatics)
Master of Biostatistics
Graduate Diploma in Data Science
Master of Finance
Master of Management (Accounting)
Master of Commerce (Actuarial Science)
Exchange Postgraduate
Master of Science (Computer Science)

- Range of backgrounds
  - existing IT knowledge
  - academic and work history
  - career directions
  - local and international

About the subject

- Prerequisites, not-allowed subjects, credit for experience
  - Have you studied DB already? Don't study it again - get credit!
- Semester schedule: the big picture
  - weeks 1 to 6: designing and using a db (data modelling, SQL)
  - weeks 7 to 10: advanced topics
  - weeks 11 to 12: industry trends, NoSQL, discuss assessment
- Assessment
  - assignment 1: data modelling (20%) .. groups of 3
  - assignment 2: SQL (10%) .. individual work
  - end of semester exam (70%, includes data modelling and SQL)
- How to succeed in this subject
  - practice especially DM and SQL skills
  - use all the learning resources provided

Semester schedule

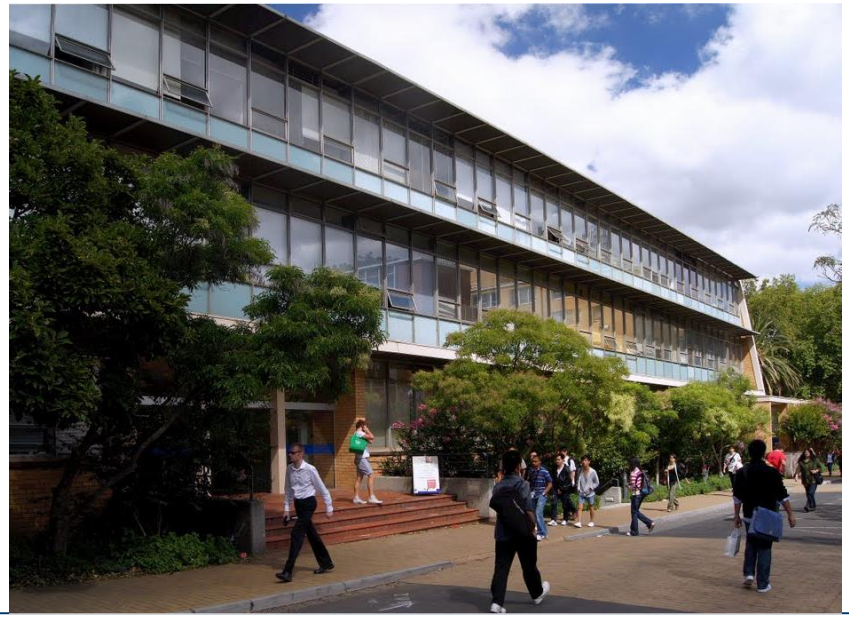
Week	Mon	Lecture Hour 1	Lecture Hour 2	Lecture / Tutorial Hour 3	Hoffer Chapter	Extra reading	Homework / Assessment
1	4-Mar	Intro to Subject	Intro to Databases & MySQL	Designing a Database	1 The Database Environment 2. The Database Development Process	Wikipedia Hoffer video History of Database	
2	11-Mar	Implementing a Database	Data Modeling 1	Tutorial SET UP & script V-N analysis | Conceptual Model	3. Modelling the data in the Organization	SE Radio 'Relational Databases'	**Assignment 1 Released**
3	18-Mar	Data Modelling 2	SQL 1	Tutorial Logical Modeling SQL1: Select, Filter, Order By, Limit	5. Logical Database Design & Relational Modeling	Simsion ch 1, Hoffer video	
4	25-Mar	Data Modelling 3 Data Dictionary	Physical Design	Tutorial Physical Modelling SQL2: Inner Joins, Natural Joins, Alias, Formatting, Round, Operators	6. Physical DB Design & Performance	Simsion chapter 3, Hoffer video	
5	1-Apr	Normalisation	SQL 2	Tutorial SQL 3 DQL, Sub Query, Unary Joins, Functions	7. Introduction to SQL	Simsion chapter 4, SE Radio 'SQL'	**Assignment 2 Released**
6	8-Apr	SQL 3 (inc. Views)	SQL 4 DML, DCL, DDL	Tutorial Normalisation SQL 4: Practice DQL	8. Advanced SQL	Hoffer video, Kent (1983) Normalization, MySQL data types	**Assignment 1 Due**
7	15-Apr	Databases in Applications	Web Applications	Tutorial SQL 5: Outer Joins, Unary Joins (shh!), views, relational divides	10. The Internet Database Environment	O'Reilly video: Intro to Web	
BREAK	22-Apr						

Schedule second half

8	29-Apr	Transactions & Concurrency	Assignment 1 Feedback	Tutorial Referential Integrity SQL 6: DDL, DML, DCL	14. Distributed Databases	Panel discussion on distributed	**Assignment 2 Due**
9	6-May	Data and Database Administration	Security & Ethics	Guest Lecture	13. Data and Database Administration	MySQL database administration Oracle database administration	
10	13-May	Distributed Databases	Cloud Databases	Assignment 2 Feedback		Martin Fowler NoSQL overview podcast on 'CAP Theorem'	
11	20-May	Data Warehouseing	NoSQL Databases	NoSQL Databases		How Facebook stores data; Info Week	
12	27-May	Revision 1	Revision 2	Exam Prep			

Labs

- Only run in weeks 2 through 8
- Not assessed, and attendance not recorded
- Demonstrator/tutor is there to help
- You can work in labs or at home
- https://handbook.unimelb.edu.au/2019/subjects/info90002
- Monday - Friday
- Lab exercises on LMS

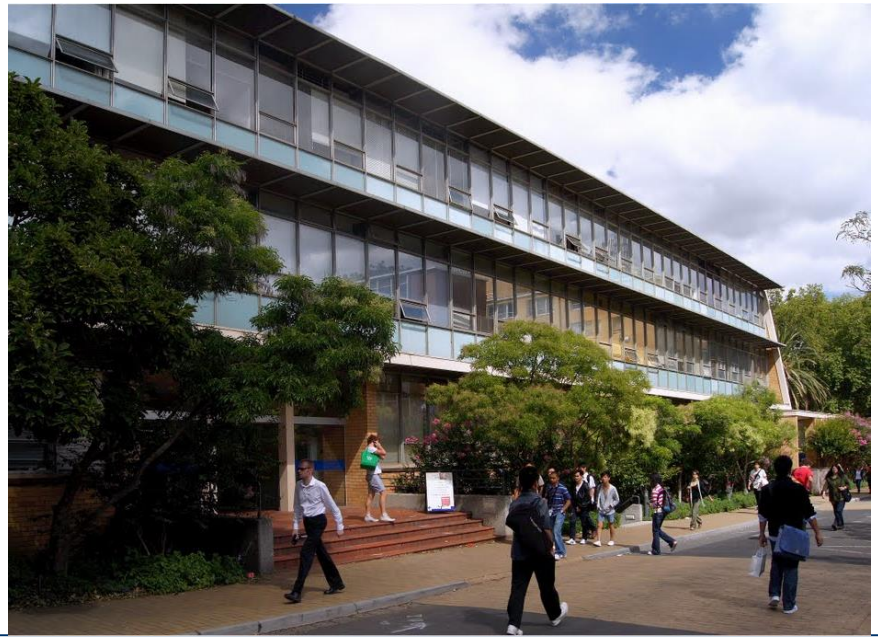


Lab exercises

- Week 2 – 4 = data modelling, SQL

  (bring paper and pen for modelling!)

- Weeks 5 – 8 = SQL programming
  - a: learn by running example SQL provided
  - b: write SQL in response to a question



Using database software

- We will use *MySQL* as server and client in this subject
- You can use either:
  - the University's database server
    - accessible from labs, or from home via VPN
    - your assignment 2 must be able to run on this server!
  - or, your own computer
    - do lab exercises and assignments at home
- Server address: info90002db.eng.unimelb.edu.au : port 3306
    - your username and password will be given out in first lab
    - not available outside the university without a VPN
- If you want to use your own computer …
  - download MySQL from http://dev.mysql.com/downloads/mysql/
  - get both Server and Workbench

Teaching resources and LMS