MONASH University
Information Technology

FIT2077
Advanced data management

Unit Guide

Semester 1, 2015

Last updated: 20 Mar 2015

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FIT2077 Advanced data management - Semester 1, 2015

This unit extends the study from FIT1004 Data management. FIT2077 will introduce more advanced concepts in the areas of database design, SQL, query optimisation and the handling of unstructured data (XML) both externally and within a database. The issue of "Big Data" and the role played by BI technologies and data warehouses will be explored.

Mode of Delivery

Caulfield (Day)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

(a.) Contact hours for on-campus students:

- Two hours of lectures
- One 2-hour laboratory

(b.) Additional requirements (all students):

- A minimum of 8 hours independent study per week for completing lab and project work, private study and revision.

See also Unit timetable information

Unit Relationships

Prohibitions

CSE3000, FIT3118, FIT4038

Prerequisites

FIT1004 or CSE2132 or equivalent

Chief Examiner

Mr Lindsay Smith

Campus Lecturer

Caulfield

Lindsay Smith

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through the Student Evaluation of Teaching and Units (SETU) survey. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, see:

www.monash.edu.au/about/monash-directions/ and on student evaluations, see:
www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html

Previous Student Evaluations of this Unit

In response to the last SETU of this unit, the following changes have been made:

- the number of topics covered in lab sessions have been reduced by the exclusion of MongoDB - the theory will be covered (as part of Big Data and noSQL) but no practical sessions will be required.

Student feedback has highlighted the following strength(s) in this unit:

- strong practical skills are developed which support finding a job in this area of IT.

If you wish to view how previous students rated this unit, please go to
https://emuapps.monash.edu.au/unitevaluations/index.jsp

Academic Overview

Learning Outcomes

At the completion of this unit, students should be able to:

- design a database model from a given scenario, using the Extended Entity Relationship model;
- demonstrate a fluency with relational algebra commands;
- create triggers, procedures and functions to enhance the logic stored in a database;
- analyse SQL query operations to optimise their performance;
- create XML documents and schemas to represent a given scenario;
- implement, and manipulate, XML structure in a database;
- describe the role played by Data Warehouses and Business Intelligence (BI) with respect to "Big Data".

Unit Schedule

Week	Activities	Assessment
0	Please check the Moodle site	No formal assessment or activities are undertaken in week 0
1	Entity Relationship Model Review	
2	Advanced Data Modelling	
3	SQL Review	
4	PL/SQL Triggers	
5	PL/SQL Procedures and Functions	Lab Task 1 due (10 marks)
6	Unstructured Data - XML documents	
7	XML Schemas	
8	XML in the database	Lab Task 2 due (15 marks)
9	Relational Algebra and SQL Relational set operators	
10	File Organisation and Query Algorithms	
11	Tuning and Query Optimisation	Lab Task 3 due (15 marks)
12	Big Data and noSQL	
	SWOT VAC	No formal assessment is undertaken in SWOT VAC
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your learning system.

Teaching Approach

Lecture and tutorials or problem classes

This teaching and learning approach helps students to initially encounter information at lectures, discuss and explore the information during tutorials, and practice in a hands-on lab environment.

Assessment Summary

Examination (3 hours): 60%; In-semester assessment: 40%

Assessment Task	Value	Due Date
Lab Task 1 - EERM Design	10%	Thursday 2nd April 2015
Lab Task 2 - Advanced SQL	15%	Thursday 30th April 2015
Lab Task 3 - Unstructured Data	15%	Thursday 21st May 2015
Examination 1	60%	To be advised

Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles
(http://intranet.monash.edu.au/infotech/resources/staff/edgov/policies/assessment-examinations/assessment-hurd

Academic Integrity - Please see resources and tutorials at
http://www.monash.edu/library/skills/resources/tutorials/academic-integrity/

Assessment Tasks

Participation

- **Assessment task 1**

  Title:
  Lab Task 1 - EERM Design
  Description:
  From a supplied scenario students will be asked to model the situation using the Extended Entity Relationship Modelling approach. The design will then be used to generate a schema to create appropriate tables under Oracle.
  Weighting:
  10%
  Criteria for assessment:

  - Correct Logical ERD model created including - entities, PK's, attributes, relationships (connectivity and participation).
  - Generated Oracle schema file executes correctly against Oracle to produce valid database structure.

  Due date:
  Thursday 2nd April 2015

- **Assessment task 2**

  Title:
  Lab Task 2 - Advanced SQL
  Description:
  Students will be supplied with a database design via a schema file and asked to create the database under Oracle. The created database will be populated with supplied data and then used to develop a set of SQL queries, triggers, procedures and functions to meet supplied user requirements.
  Weighting:
  15%
  Criteria for assessment:

  - SQL queries must execute correctly and produce correct visible output.
  - Coded PL/SQL must compile and meet the problem specifications.

  Due date:
  Thursday 30th April 2015

- **Assessment task 3**

Title:
Lab Task 3 - Unstructured Data
Description:
Students will be supplied with a scenario and required to represent that data through the use of XML, including authoring of an appropriate schema, both external to the database and also within Oracle.
Weighting:
15%
Criteria for assessment:

- Completed exercise must provide the output specified in the exercise brief and make optimal use of coding.

Due date:
Thursday 21st May 2015

Examinations

- **Examination 1**

Weighting:
60%
Length:
3 hours
Type (open/closed book):
Open book
Electronic devices allowed in the exam:
None

Learning resources

Monash Library Unit Reading List (if applicable to the unit)
http://readinglists.lib.monash.edu/index.html

Feedback to you

Types of feedback you can expect to receive in this unit are:

- Informal feedback on progress in labs/tutes
- Graded assignments with comments
- Solutions to tutes, labs and assignments

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process: http://www.monash.edu.au/exams/special-consideration.html

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Resubmission of assignments

At the Chief Examiners discretion, students may be permitted to resubmit assignments where *serious* medical issues or other problems have impacted a students work.

Referencing requirements

Students are required to use the APA style of referencing for this unit, details are available from:

- http://www.lib.monash.edu.au/tutorials/citing/apa.html
- http://guides.lib.monash.edu/content.php?pid=88267&sid=656564
- Chapter 10 of the Faculty of Business and Economics Q Manual (http://www.buseco.monash.edu.au/publications/qmanual/qmanual.pdf)

Assignment submission

It is a University requirement (http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-managing-pla for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at http://www.infotech.monash.edu.au/resources/student/forms/. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an electronic submission). Please note that it is your responsibility to retain copies of your assessments.

Online submission

If Electronic Submission has been approved for your unit, please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

Prescribed text(s)

Limited copies of prescribed texts are available for you to borrow in the library.

Coronel, C and Morris, S. (2015). *Database Systems: Design, Implementation, and Management*. (11th Edition) Cengage Learning (ISBN: 1-285-19164-7).

Technological Requirements

Students are required to check regularly check Moodle for announcements and updates to unit material. Sudents who own a laptop (Mac or Windows) may install the unit software on their own machine and may use the laptop in class.

Recommended Resources

This unit will make use of the Oracle 11G database running on the Monash ITS server hippo.its.monash.edu. All students will have an account on this server which will suffice for all database work this semester.

Although it is ***not required***, if students wish to run a database server at home they can download Oracle XE (eXpress Edition) from the unit Moodle site or directly from the Oracle technet site:

- http://www.oracle.com/technology/software/products/database/xe/index.html

Please note:

1. for technet, registration (free) is required, and
2. this is a large download (around 200Mb) and **should not be attempted** without first consulting your campus lecturer.

The client software for accessing Oracle (SQLDeveloper) will be available in the labs. It will also be available via a download from the Moodle site for installation at home. SQLDeveloper is also available, after registration (free), from the technet site:

- http://www.oracle.com/technology/software/products/sql/index.html

Recommended text(s)

Elmasri, R and Navathe, S. (2011). *Fundamentals of Database Systems*. (6th Edition) Addison-Wesley (ISBN: 0136086209).

Carey, P. (2007). *XML 2nd Edition Comprehensive*. (2nd Edition) Cengage Learning.

Examination material or equipment

Notes, texts, resource material and calculators may be taken into the examination. Computers are not permitted.

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:
www.policy.monash.edu.au/policy-bank/academic/education/index.html

Faculty resources and policies

Important student resources including Faculty policies are located at
http://intranet.monash.edu.au/infotech/resources/students/

Graduate Attributes Policy

http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.h

Student Charter

www.opq.monash.edu.au/ep/student-charter/monash-university-student-charter.html

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at http://www.monash.edu.au/students. For Malaysia see http://www.monash.edu.my/Student-services, and for South Africa see http://www.monash.ac.za/current/.

Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to www.lib.monash.edu.au or the library tab in my.monash portal for more information. At Malaysia, visit the Library and Learning Commons at http://www.lib.monash.edu.my/. At South Africa visit http://www.lib.monash.ac.za/.

Disability Liaison Unit

Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis.

- Website: http://www.monash.edu/equity-diversity/disability/index.html
- Telephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Commuity Services at 03 55146018 at Malaysia
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1, Building 55, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Malaysia Campus