MONASH University
Information Technology

FIT1043
Introduction to data science

Unit Guide

Semester 2, 2015

Last updated: 27 Jul 2015

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This unit looks at processes and case studies to understand the many facets of working with data, and the significant effort in Data Science over and above the core task of Data Analysis. Working with data as part of a business model and the lifecycle in an organisation is considered, as well as business processes and case studies. Data and its handling is also introduced: characteristic kinds of data and its collection, data storage and basic kinds of data preparation, data cleaning and data stream processing. Curation and management are reviewed: archival and architectural practice, policy, legal and ethical issues. Styles of data analysis and outcomes of successful data exploration and analysis are reviewed. Standards, tools and resources are also reviewed.

Mode of Delivery

Clayton (Day)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

1. Contact hours for students:

- Two hours lectures
- Two hours laboratories

1. Additional requirements:

- A minimum of 8 hours of personal study per week for completing lab/tutorial activities, assignments, private study and revision.

See also Unit timetable information

Chief Examiner

Dr Wray Buntine

Campus Lecturer

Clayton

Wray Buntine

Consultation hours: Tues 13:00-15:00

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

Academic Overview

Learning Outcomes

On successful completion of this unit a student should be able to:

1. explain the interaction between business processes and data in an organisation;
2. describe the role of data in different styles of business and in different parts of an organisation: health, retail, science, government;
3. demonstrate the size and scope of data storage and data processing, and classify the basic technologies in use;
4. describe tasks for data curation and management in an organisation;
5. classify participants in a data science project: such as statistician, archivist, analyst, and systems architect;
6. classify the kinds of data analysis and statistical methods available for a data science project;
7. summarise and compare resources, software and tools for a data science project.

Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	Overview of data science and what a project looks like.	
2	Roles of a data scientist, and the impact of the field.	
3	Data business models.	
4	Application areas and case studies.	
5	Characterising data and "big" data.	
6	Data sources and case studies.	
7	Resources and standards.	
8	Resources case studies.	Assignment 1
9	Data analysis theory	
10	Data analysis process.	
11	Issues in data management	
12	Data management frameworks.	Assignment 2
	SWOT VAC	No formal assessment is undertaken during 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 online during the labs. There will be some pre-lecture material for students to review so the classroom will be partially "flipped," in order to allow some discussion during lectures.

Assessment Summary

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

Assessment Task	Value	Due Date
Assessment 1: Business and data case study	20%	Friday Week 8
Assessment 2: Data science resources	20%	Friday Week 12
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:
  Assessment 1: Business and data case study
  Description:
  Learning outcomes 1, 2, 3 and 5. For this assessment task, students are required to prepare a detailed 1000 word report based on a business and data case study. The report must explain: how the case study fits into the classification and lifecycle models what sorts of data is required, and its 'V" characteristics', and the enabling factors behind the success of the project. A number of sample projects will be available to make the report on.

  Weighting:
  20%
  Criteria for assessment:
  Your report will be assessed in terms of:

  1. describing the role of data in a business;
  2. demonstrating the size and scope of data storage and data processing;
  3. classifying roles in data science project;
  4. classifying the kinds of data analysis and statistical methods used.

  Due date:
  Friday Week 8

- **Assessment task 2**

  Title:
  Assessment 2: Data science resources
  Description:
  Learning outcomes 6 and 7. Prepare a pitch for a mini project that uses/explores some open source data. The idea is to demonstrate the use of some data sources, for instance on a simple consumer/corporate web app. This should take the form of a pitch to users along with a description of data sources (ignore the business viability). For this assessment task, students are required to form teams of two and brainstorm together to prepare the pitch. They are not doing the data science project, they just have to describe it sufficiently to then present resources. The students then develop their own report which is assessed.
  Weighting:

20%

Criteria for assessment:

The report will be assessed in terms of:

1. Classifying the kinds of data analysis and statistical methods available for a data science project
2. Identifying resources, software and tools for a data science project

The paired pitches will be compared to insure proper teamwork.

Due date:

Friday Week 12

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
- Examination feedback after results publication

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.

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.

Technological Requirements

Students must regularly check Moodle for announcements. Some content will be provided via videos, audio, PDF and ePUBs so students must have a suitable laptop or similar to access the content.

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