COMP6200

Data Science

Session 1, Weekday attendance, North Ryde 2020

Department of Computing

Contents

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General Information

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Credit points
10

Prerequisites

Corequisites

Co-badged status

Unit description
This unit introduces students to the fundamental techniques and tools of data science, such as the graphical display of data, predictive models, evaluation methodologies, regression, classification and clustering. The unit provides practical experience applying these methods using industry-standard software tools to real-world data sets. Students who have completed this unit will be able to identify which data science methods are most appropriate for a real-world data set, apply these methods to the data set, and interpret the results of the analysis they have performed.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Identify the appropriate Data Science analysis for a problem and apply that

method to the problem.

ULO2: Interpret Data Science analyses and summarise and identify the most important aspects of a Data Science analysis.

ULO3: Present the results of their Data Science analyses both verbally and in written form.

ULO4: Discuss the broader implications of Data Science analyses.

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult iLearn for revised unit information.

Find out more about the Coronavirus (COVID-19) and potential impacts on staff and students

General Assessment Information

Late Submission

No extensions will be granted without an approved application for Special Consideration. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late. For example, 25 hours late in submission for an assignment worth 10 marks – 20% penalty or 2 marks deducted from the total. No submission will be accepted after solutions have been posted.

Supplementary Exam

If you receive special consideration for the final exam, a supplementary exam will be scheduled after the normal exam period, following the release of marks. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Classes

There will be one two hour lecture each week and one two hour workshop in the computing laboratory.   You are expected to attend both classes as they provide complimentary learning activities each week. In practical classes you will write code and experiment with various data sets; in lectures we will discuss the methods you are learning and how the results of your analysis can be interpreted.

Textbooks

We will refer to the following texts during the semester:

Introduction to Data Science A Python Approach to Concepts, Techniques and Applications **Igual**, Laura, **Seguí**, Santi (electronic edition available via MQ Library)

Computational and Inferential Thinking: The Foundations of Data Science By Ani Adhikari and John DeNero (available on GitBooks)

You will be given readings from these and other sources each week.

Technology Used and Required

We will make use of Python 3.6 for data analysis, including a range of modules such as *scikit-learn, pandas, numpy* that provide additional features. These can all be installed via the Anaconda Python distribution.   We will discuss this environment and the installation process in the first week of classes.

We will use Jupyter Notebook as a way of developing and presenting the analysis results. This is included in the full Anaconda distribution.

Project Work

A major part of the assessment in this unit is based on a project that you will complete in groups. This will allow you to explore the techniques you are learning in class in a real-world data analysis exercise.

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult iLearn for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Unit Schedule

The indicative list of topics is shown here, this is subject to change based on feedback from the class.

1	Overview of DS, Learning Python, Notebooks	SC
2	Data formats, Python input and output	SC
3	Descriptive Statistics, simple visualisation	SS
4	Causality and correlation; Visualisation	SS
5	Predictive Modelling: Linear and Logistic Regression	SS
6	Software Engineering for Data Science	SC
7	Feature sets and spaces; Unsupervised learning	SS
8	Supervised Learning: K-Nearest Neighbours	XZ
9	Naive Bayes Classifiers	XZ
10	Artificial Neural Networks	XZ
11	Learning Decision Trees	XZ
12	Data Science Applications	Guest
13	Summary	All

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public

- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

The presentation component of the group project has been moved to a video presentation to help manage the logistics of a large number of students needing to present in the final week of semester.