STAT7123

Statistical Graphics

Session 2, Special circumstances 2021

Archive (Pre-2022) - Department of Mathematics and Statistics

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Disclaimer

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Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.

General Information

Unit convenor and teaching staff Houying Zhu houying.zhu@mq.edu.au Petra Graham petra.graham@mq.edu.au
Credit points 10
Prerequisites Admission to MRes
Corequisites
Co-badged status
Unit description We present the principles of effective graphical presentation, set them in a historical context and apply them to a variety of statistical data sets. Emphasis is given to use of modern multivariate graphical techniques such as trellis/lattice graphs and mosaic plots to show a variety of displays of data and model fits, and to display model consistency with data. To present graphics, we introduce and use R, as well as other standard packages. Participants choose an area for further investigation related to their interests.

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: be familiar with important and contemporary examples of graphics, and be able to use them.

ULO2: be aware of the elements of graphical design, and use them to critically appraise presented graphics in articles and web pages and suggest appropriate ways to improve them.

ULO3: use the computer to generate appropriate graphics using particular packages or languages and be able to develop the ability to do so in others.

ULO4: be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.

ULO5: use statistical graphics to investigate and analyse data, check statistical model assumptions and effectively present the results of statistical investigations graphically to a range of audiences.

General Assessment Information

All assignments are individual assessment tasks. There is no group work. More details will be provided on the iLearn page in due course.

Assignment Submission

Assignment submission will be online through the iLearn page. Read the submission statement carefully before accepting it as there are substantial penalties for making a false declaration.

- Assignment submission is via iLearn. You should upload this as a single PDF file.
- It is your responsibility to make sure your assignment submission is legible.
- If there are technical obstructions to your submission online, please email us to let us know.

Late Submission of Work: All assessment tasks must be submitted by the official due date and time. In the case of late submission for a non-timed assessment (e.g. an assignment), if special consideration has NOT been granted, 20% of the earned mark will be deducted for each 24-hour period (or part thereof) that the submission is late for the first 2 days (including weekends and/or public holidays). For example, if an assignment is submitted 25 hours late, its mark will attract a penalty equal to 40% of the earned mark. After 2 days (including weekends and public holidays) a mark of 0% will be awarded. Timed assessment tasks (e.g. tests, examinations) do not fall under these rules.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	25%	No	Week 4
Assignment 2	35%	No	Week 8
Assignment 3	40%	No	Week 13

Assignment 1

Assessment Type [1]: Qualitative analysis task
Indicative Time on Task [2]: 20 hours
Due: **Week 4**
Weighting: **25%**

Five statistical graphics should be collected during the first half of the semester from newspaper articles or journal articles published this year. You must not draw your own graphics or get someone else to do so for you. Credit will be given for interesting, carefully chosen graphics which show evidence of searching widely. The five statistical graphics must be included in your submission along with the source of each graphic (title of the article, authors, source, page numbers or url etc.) and each graphic must be discussed.

This discussion must include strengths and weaknesses of each graphic. It may include the reason why you chose the graphic.

On successful completion you will be able to:

- be familiar with important and contemporary examples of graphics, and be able to use them.
- be aware of the elements of graphical design, and use them to critically appraise presented graphics in articles and web pages and suggest appropriate ways to improve them.
- be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.

Assignment 2

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 20 hours
Due: **Week 8**
Weighting: **35%**

A data set with some documentation will be given. This data set must be analysed and a concise, well-organised report on your analysis must be prepared. The analysis must be appropriate and be substantially graphical. Appropriate statistical graphics explored or mentioned in the lectures should be used. The statistical package R must be used.

On successful completion you will be able to:

- be familiar with important and contemporary examples of graphics, and be able to use them.
- be aware of the elements of graphical design, and use them to critically appraise presented graphics in articles and web pages and suggest appropriate ways to improve them.

- use the computer to generate appropriate graphics using particular packages or languages and be able to develop the ability to do so in others.
- be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
- use statistical graphics to investigate and analyse data, check statistical model assumptions and effectively present the results of statistical investigations graphically to a range of audiences.

Assignment 3

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 23 hours
Due: **Week 13**
Weighting: **40%**

A data set with some documentation will be given. This data set must be analysed and a concise, well-organised report on your analysis must be prepared. The analysis must be appropriate and be substantially graphical. Appropriate statistical graphics explored or mentioned in the lectures should be used. The statistical package R must be used.

On successful completion you will be able to:

- be aware of the elements of graphical design, and use them to critically appraise presented graphics in articles and web pages and suggest appropriate ways to improve them.
- use the computer to generate appropriate graphics using particular packages or languages and be able to develop the ability to do so in others.
- be familiar with a range of modern multivariate graphical techniques and know when it is appropriate to use them.
- use statistical graphics to investigate and analyse data, check statistical model assumptions and effectively present the results of statistical investigations graphically to a range of audiences.

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Lectures

The lectures commence in Week 1 and will be pre-recorded. Videos and lectures materials will be uploaded to iLearn, please refer to the iLearn site for more details.

Small-Group Teaching Activities (SGTAs)

SGTA classes will start in Week 2, please refer to iLearn for more details.

Recommended Books

There is no specified textbook for this unit and a variety of readings will be available. The following books are good general references that may be used during the semester.

- Chen, C., Hardle, W. and Unwin, E. (eds.) (2008) Handbook of Data Visualization. Springer-Verlag, Berlin.
- Cleveland, W. (1993) Visualizing Data. Hobart Press, New Jersey.
- Rahlf, T. (2017) Data Visualisation with R. Springer International Publishing AG.
- Tufte, E. (2001) The Visual Display of Quantitative Information (Second Edition). Graphics Press: Cheshire, Conn.
- Tufte, E. (1990) Envisioning Information. Graphics Press: Cheshire, Conn.
- Tufte, E. (1997) Visual Explanations: Images, and Quantities, Evidence and Narrative (Third edition). Graphics Press: Cheshire, Conn.
- Wickham, H. and Grolemund, G. (2017) R for Data Science Import, Tidy, Transform, Visualize, and Model Data. O'Reilly Media, Inc, USA.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). 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

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

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/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.