wbs
WARWICK BUSINESS SCHOOL
THE UNIVERSITY OF WARWICK

For the Change Makers

Programming for Data Analytics

Week 1: Introduction and Data Collection

Information Systems and Management
Warwick Business School

Part 1: General information

- Instructor details
- Module objectives
- Module topics
- Module resources

Instructor

- Zhewei Zhang
  - ❑Assistant professor at ISM

- Teaching assistant
  - ❑Lichuan Xiang
  - ❑Ph.D. in Computer Science at Warwick

Blended Teaching

- Asynchronous managed learning time
  - ❑Flexible time
  - ❑Pre-recorded video and ***readings*** (with tasks/exercises)
- Synchronous large-group lecture
  - ❑Thursday 12:00PM -13:00PM
  - ❑Recorded, available on wbsLive
- Synchronous small-group seminar
  - ❑Friday 13:00PM – 15:00PM (two one-hour sessions)
  - ❑Not recorded

Why take this module?

- Top performing organizations make informed decisions by analysing data.
- Organizations require data-driven decisions.
- 60% potential increase in operating margins possible with big data:
  - ↑ efficiency
  - ↑ effectiveness

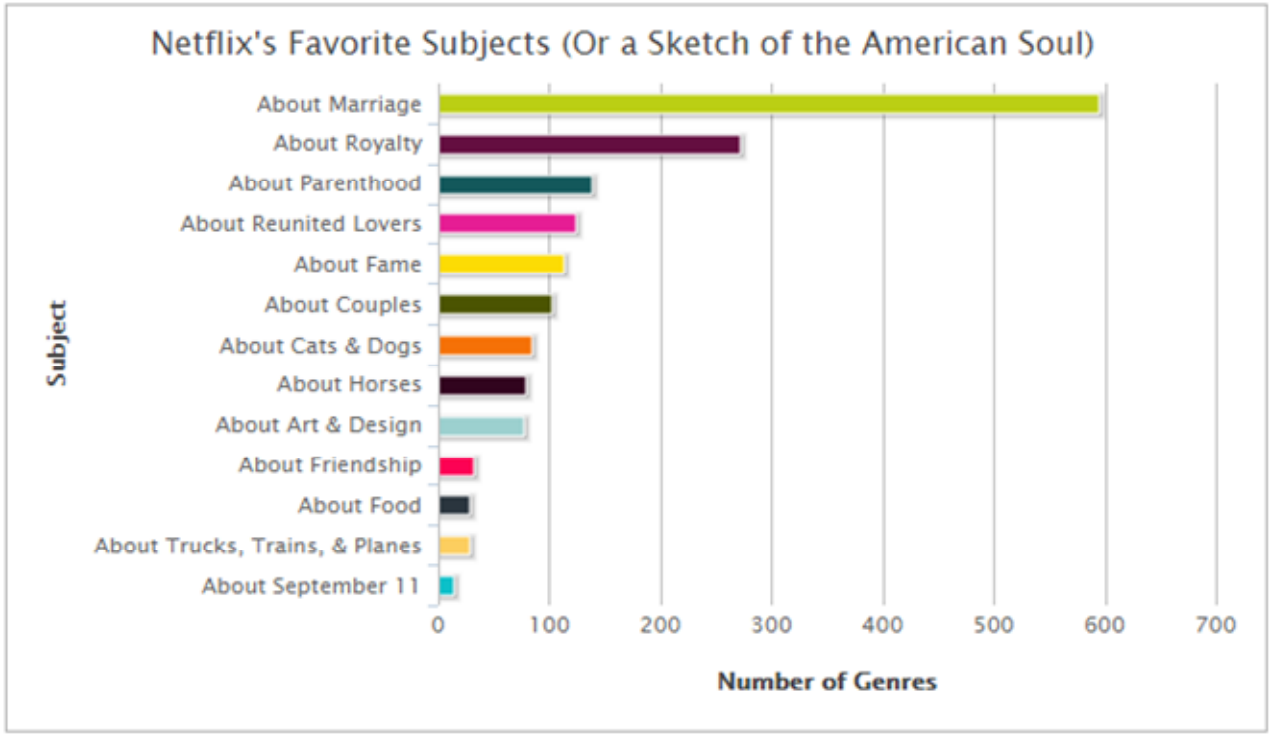
Big Data, Analytics and the Path From Insights to Value

LaValle, S., Lesser, E., Shockley, R., Hopkins, M. S., & Kruschwitz, N. (2011). Big data, analytics and the path from insights to value. *MIT Sloan Management Review*, *52*(2), 21-31.

Why take this module?

- "Netflix Quantum Theory"
  - User generated database of American cinematic predilections.
  - The data won't tell you *how* to make content, but it will tell you *what* content you should be making.
  - When you create a show like *Stranger Things*, you are not guessing at what people want.

NETFLIX



http://www.theatlantic.com/technology/archive/2014/01/how-netflix-reverse-engineered-hollywood/282679/

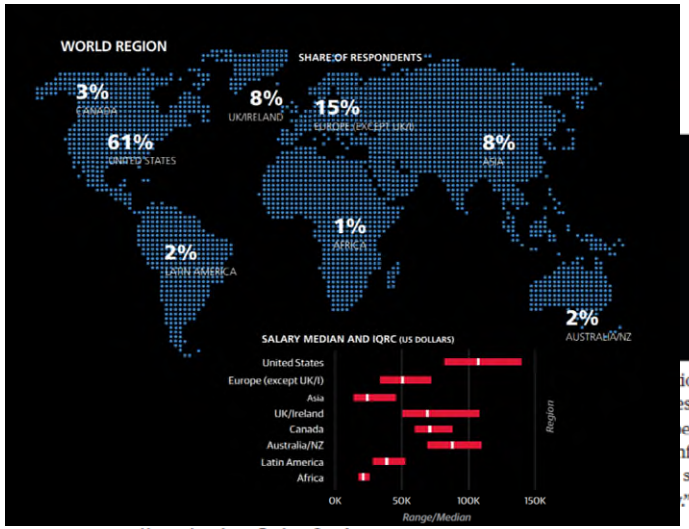
Why take this module?

- The skill of working with large quantities of information increasingly valuable.
- Help leaders reformulate challenges in ways that data analytics can tackle and solve.

King, J., & R. Magoulas (2016). Data Science Salary Survey. O'Reilly Media.

Data Scientist:

The Sexiest Job of the 21st Century



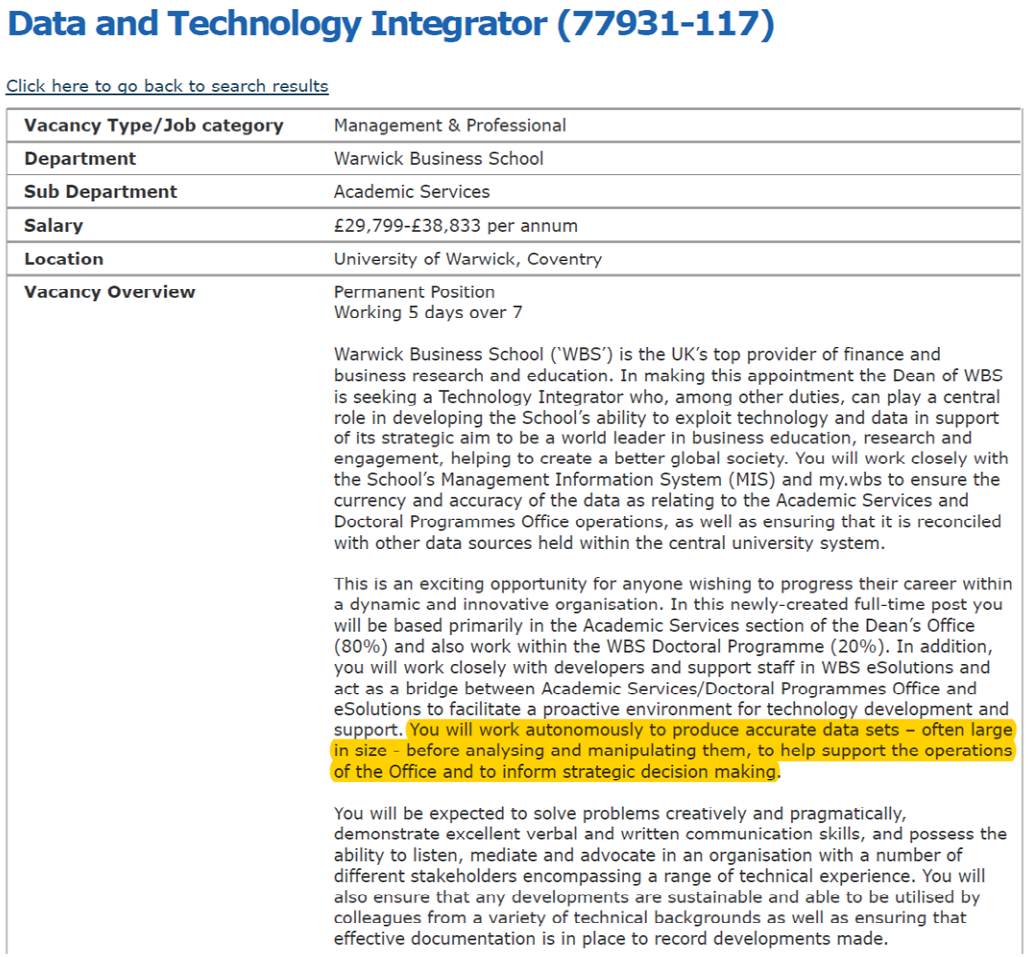
hen Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't
ions with the people who were already on the site
s had expected. Something was apparently miss-
erience. As one LinkedIn manager put it, "It was
nference reception and realizing you don't know
stand in the corner sipping your drink—and you
."

70 Harvard Business Review October 2012

Davenport, T. H., and D. J. Patil. (2012). Data scientist: the sexiest job of the 21st century. *Harvard Business Review*, 90(10), 70-76.

Why take this module?

- To survive in the data-driven economy. (http://www.telegraph.co.uk/news/2017/09/27/jobs-risk-automation-according-oxford-university-one/
- Able to work in a data-rich environment.
- Be ready for the emerging new jobs.



Data and Technology Integrator (77931-117)

Click here to go back to search results

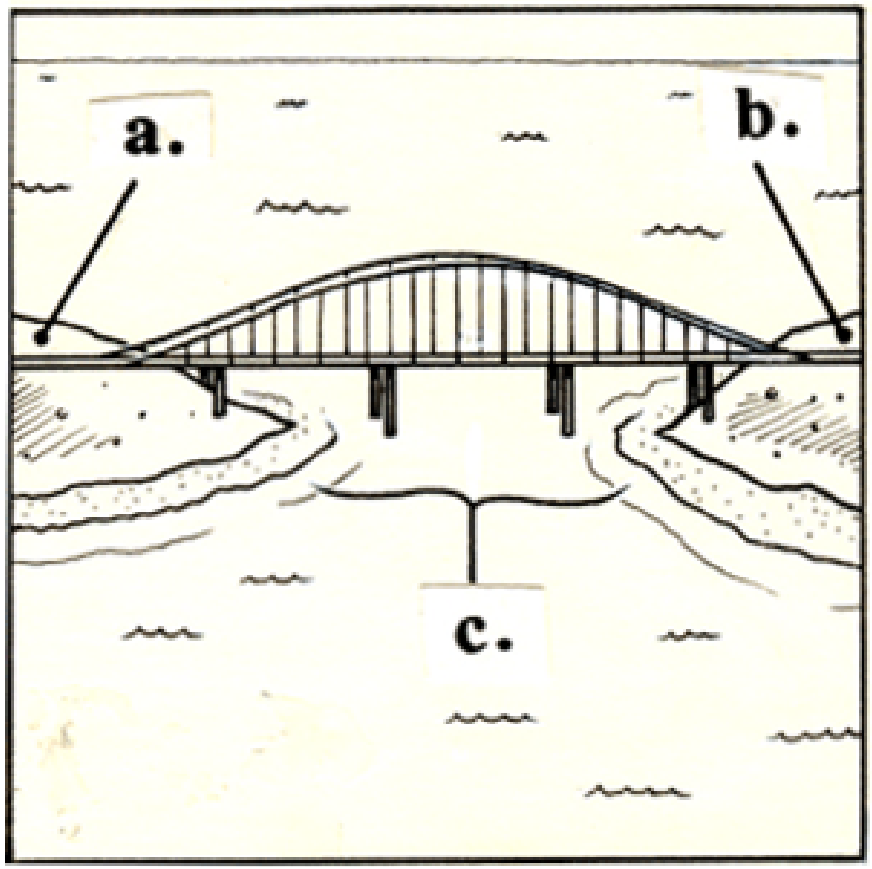
Vacancy Type/Job category	Management & Professional
Department	Warwick Business School
Sub Department	Academic Services
Salary	£29,799-£38,833 per annum
Location	University of Warwick, Coventry
Vacancy Overview	Permanent Position Working 5 days over 7 Warwick Business School ('WBS') is the UK's top provider of finance and business research and education. In making this appointment the Dean of WBS is seeking a Technology Integrator who, among other duties, can play a central role in developing the School's ability to exploit technology and data in support of its strategic aim to be a world leader in business education, research and engagement, helping to create a better global society. You will work closely with the School's Management Information System (MIS) and my.wbs to ensure the currency and accuracy of the data as relating to the Academic Services and Doctoral Programmes Office operations, as well as ensuring that it is reconciled with other data sources held within the central university system. This is an exciting opportunity for anyone wishing to progress their career within a dynamic and innovative organisation. In this newly-created full-time post you will be based primarily in the Academic Services section of the Dean's Office (80%) and also work within the WBS Doctoral Programme (20%). In addition, you will work closely with developers and support staff in WBS eSolutions and act as a bridge between Academic Services/Doctoral Programmes Office and eSolutions to facilitate a proactive environment for technology development and support. You will work autonomously to produce accurate data sets – often large in size - before analysing and manipulating them, to help support the operations of the Office and to inform strategic decision making. You will be expected to solve problems creatively and pragmatically, demonstrate excellent verbal and written communication skills, and possess the ability to listen, mediate and advocate in an organisation with a number of different stakeholders encompassing a range of technical experience. You will also ensure that any developments are sustainable and able to be utilised by colleagues from a variety of technical backgrounds as well as ensuring that effective documentation is in place to record developments made.

This module is…

a. Area of Business Insight (i.e. decision maker, marketer, strategy maker, operation manager…)

b. Area of Raw Data (i.e. data, database, application manager…)

c. The Bridge (i.e. interpreter, translator, analyst…)



This module is not…

- About statistics.
- About econometrics.
- About ML algorithms.

Module objectives

- Understanding of value of data analytics in solving real-world problems.
- Understanding of foundational concepts underlying data analytics.
- Understanding of tasks commonly carried in data analytics.
- Ability to critically apply data analytics tools to real-world problems.

Module topics and schedule

1) Data collection (wk1, wk2, wk3)
   - Web scraping with Python; SQL and BigQuery; API and JSON
2) Data visualization (wk3, wk4)
   - Tableau, Matplotlib and Seaborn
3) Data wrangling (wk5, wk6, wk7)
   - Cleaning, process, transformation (Numpy and Pandas)
4) Data analysis (wk7, wk8, wk9)
   - *Clustering*, network analysis, classification and regression (NetworkX, Scikit-learn).
5) Model tuning and Deep learning (wk9, wk10)
   - Model improvement, architecture design, network tuning (Keras: Tensorflow).

Module philosophy

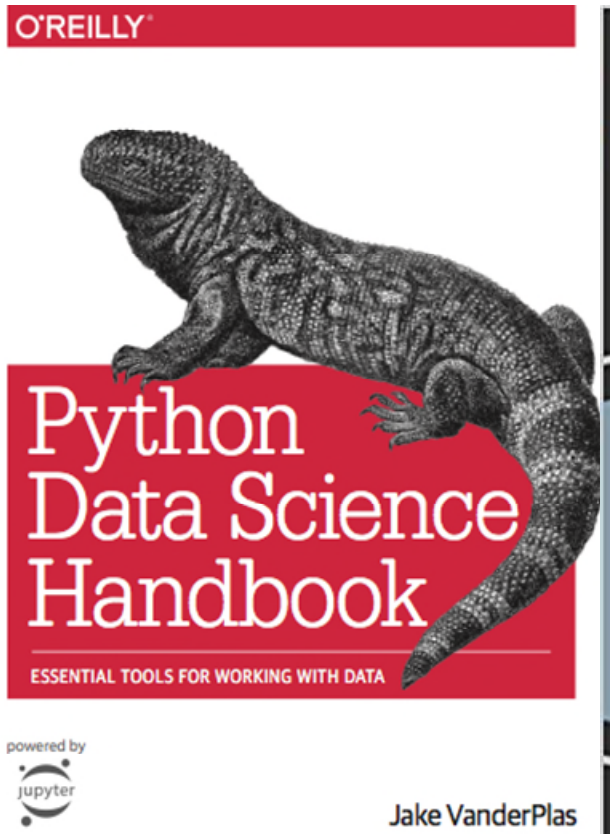
- We are all learners
- Understand the underlying concepts and apply them in exercises:
  - In class, during lectures and tutorials
  - Through the individual homework
- Get your hands dirty!

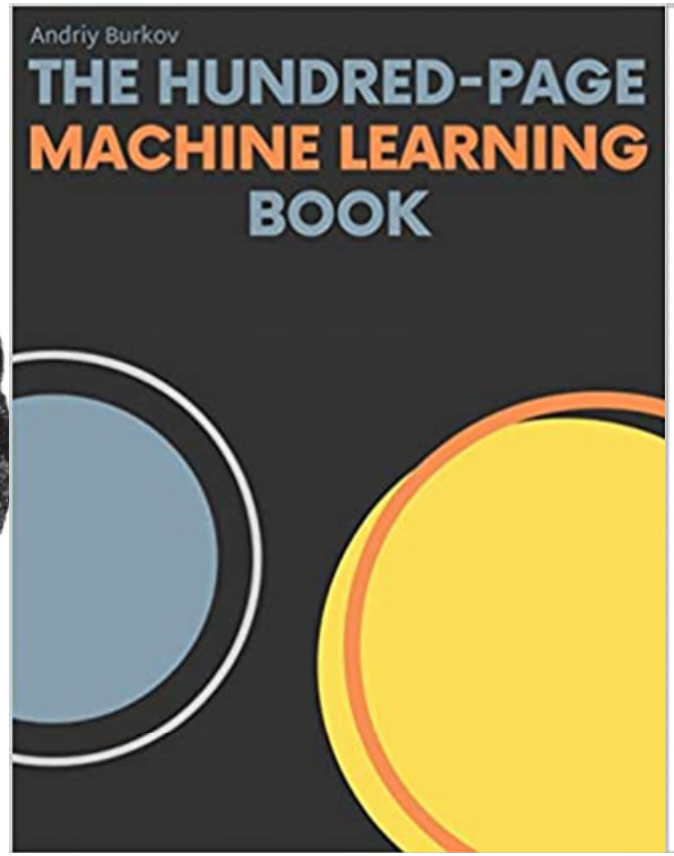
Module resources

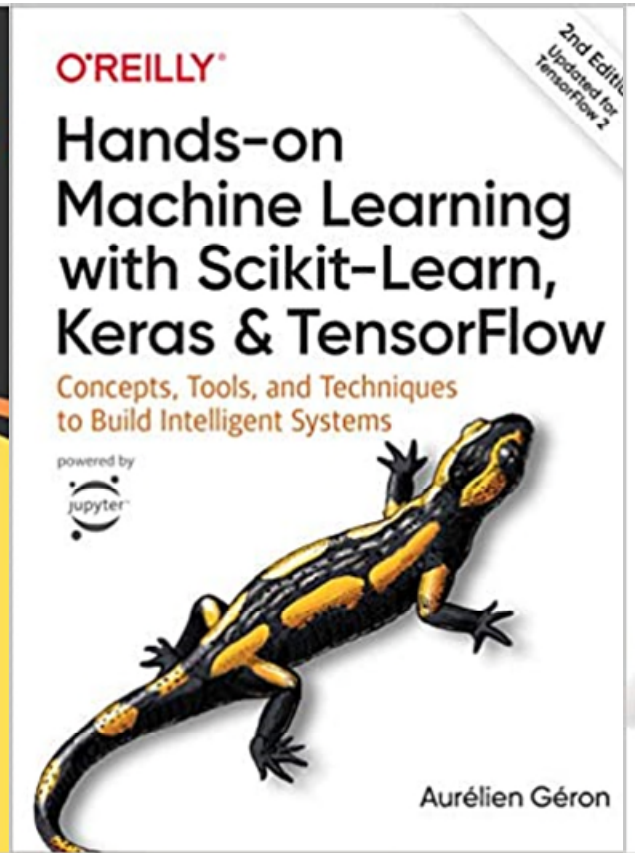
Module resources

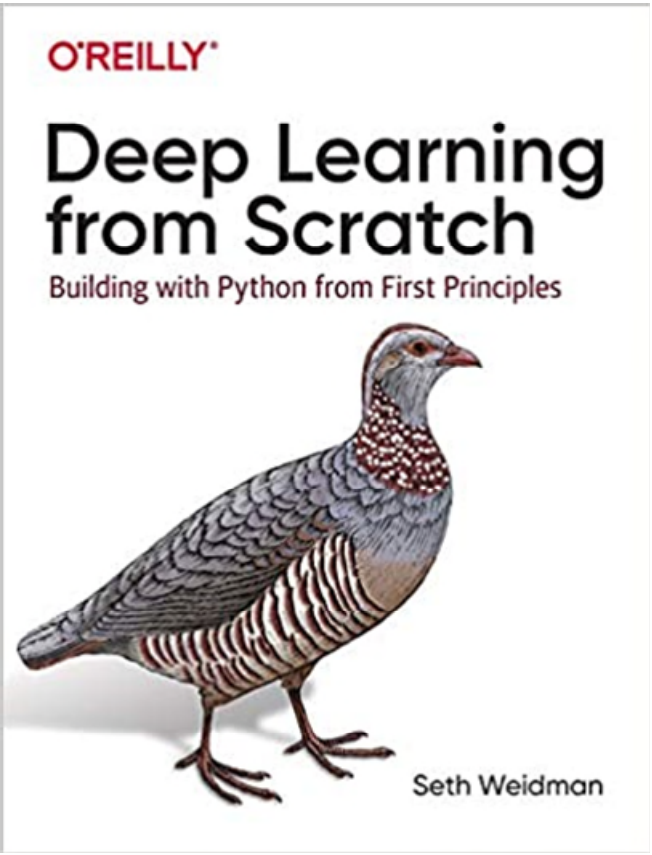
- *my.wbs*
  - Extremely important to have access
  - Slides, information about assignments, projects, etc.
  - Readings, useful links, etc.
  - News, grades, etc.

Module resources









Part 2: Evaluation

Evaluation scheme

- One individual project.
- Question will be released in week 5.
- 4 weeks to work.
- Applying techniques learned in the class to solve the given questions, with an executive report.

Part 3: Miscellaneous

- Rules of the game
- My expectations

Rules of the game

- Late submission
  - Extension request
  - Automatic penalty per day overdue
- ZERO tolerance for cheating and plagiarism

Rules of the game

- Each class counts, as content builds on each other iteratively
  - it is expected that you have read the assigned material and come prepared.
  - be able to address questions adequately and to participate constructively in discussions.

Getting help

- Office Hour appointment
- Module webpage and emails (please email me with 'IB9JV0' in the title)
- Module forum

My expectations

- It is expected that you have read the assigned material and come prepared.
- It is expected that you are able to address questions adequately and to participate constructively in discussions.
- It is expected that you practise after the lecture.
- Learning by doing.
- We all make mistakes.

Questions?