COMP9321 Data Services Engineering

Term1, 2020

Week 1: Course Overview

Disclaimer

- Parts of the slides presented in the course are taken from previous offering for COMP9321 where the course material was prepared by Dr. Helen Paik and Dr. Lina Yao
- No services were hurt during the preparation of the course slides

Teaching Team

- Lecturer-in-Charge (LiC)
  - Mortada Al-Banna (m.al-banna@unsw.edu.au) feel free to schedule consultations 4-5PM Every Wednesday.
  - Office: K17 401 (Desk 29)
- Course Administrator
  - Mohammad Ali Yaghub Zade Fard (m.yaghoubzadehfard@unsw.edu.au)
- Tutors
  - Mohammad Ali Yaghub Zade Fard
  - Shayan Zamani
  - More to be confirmed
- Course Web site
  - http://www.cse.unsw.edu.au/~cs9321

COMP9321 Evolution

Previously known as Web applications engineering.

What was taught and why needed revision

- How to build Web sites using Java
- Standardised frameworks for Web apps (plenty)

Many Web apps are now data-oriented or utilise data heavily

–functionality requires combining or processing complex data from multiple sources

So COMP9321 became Data Service Engineering:

- How to work with data
- How to make the design and implementation of data-oriented service easy (i.e., an approach/technique)

So what is this course about?

Data Services Engineering

Data = is the problem we want to deal with, understanding the problems and possible ways to work with Data (e.g., “get” data, “publish” data, discover or manage multiple data sources, etc).

Services = is the proposed solution/design approach to make our problem “manageable”.

Engineering = (best practices, weighing options, we will think about these all throughout, at least try to) - obtain conceptual ideas as well as practical skills

Course Aims

This course aims to introduce the student to core concepts and practical skills for engineering the data in service-oriented data-driven applications. Specifically, the course aims to answer these questions:

- *How to access and ingest data from various external sources?*
- *How to process and store the data for applications?*
- *How to curate (e.g. Extract, Transform, Correct, Aggregate, and Merge/Split) and publish the data?*
- *How to visualize the data to communicate effectively*
- *How to apply available analytics to the data?*

Fundamentally, we will look at these questions through the lens of 'service-oriented' software design and implementation principles. At each topic, we will learn some core concepts, and how to implement the concepts in software through services.

Assumed Knowledge

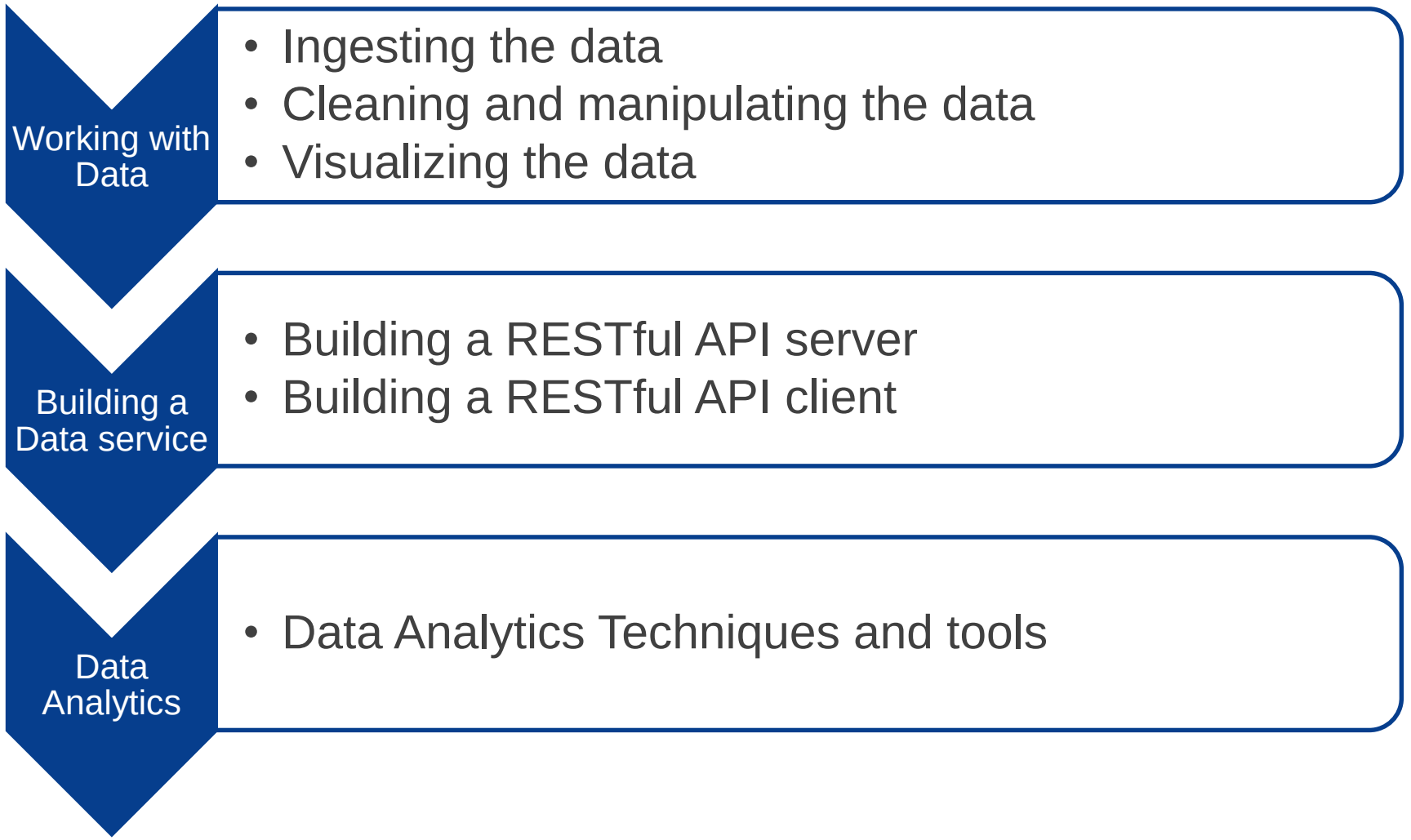
Before commencing this course, we will assume that students have:

- completed one programming course (expected to be in Python)
- basic data modelling and relational database knowledge

These are assumed to have been acquired in the following courses: For Postgrad - COMP9021 and COMP9311. For Undergrad - COMP1531 and COMP2041.

NOTE: This course is not meant to be an advanced course …

Course Structure



Assessment (Tentative)

Assessment:

- 40% formal Lab based exam: individual assessment.
- 50% on assignment work
  - Assgn1 on Data ingestion and manipulation and publication as REST API (individual) 15%
  - Assgn2 on building a service 15%
  - Assgn3 on building a data analytics service 20%
- 10% on 4-5 online quizzes (WebCMS-based quiz system, ‘open’ test)

Final Mark = quizzes + assignments + exam

Assignments Tentative

We have three individual assignments

Assignment 1: Data ingestion, cleaning manipulation and Visualization:

- 15 marks
- Release Week3, due on the end of week 5.

Assignment 2: Data Service (REST API):

- 15 marks
- Release on the Tuesday week 5, due on the end week 7.

Assignment 3: Data Analytics Service:

- 20 marks
- Release on the Tuesday week 7, due on the end week 10.

Bonus Mark

We have 5 bonus marks on the assignments work overall mark

Bonus Mark

- 5 marks added to the assignments over all
- Assignment over all= assignment1 + assignemnt2 + assignment3 + Bonus
- Assignment overall cannot be more than 50%

How?

- Any interesting ideas about doing the same activity with less complexity (fewer lines of codes and less learning required)
- Improving the code (finding bugs, documentations, etc.)
- Adding new relevant activities
- **Making a video for an activity** and describing activities in detail

Consultation Labs

- A self-guided lab exercise is released every week.
- You can do them in your own time and come to the consultation Labs if needed.
- Use the forum. Share what you have learned/found

Tentative Schedule

Week	Lectures	Tutorials/Labs	Assignments
1	Course intro	(No Lab, student should start by the Setup Python, Flask, NumPy, Pandas)	-
2	Data Access and ingestion	Accessing NoSQL DB, API data sourced, CSV files, text files.	
3	Data Cleansing and Manipulation	Cleansing data with Python Pandas	Release Ass1
4	Data Visualization	Using matplotlib library for charts and plots	
5	Building a Data service part1	Build a simple Flask application	Ass1 due/ Release Ass2
6	Building a Data service part2	Build a RESTful service with flask	
7	Data Analytics Overview	Introducing scikit learn toolkit	Ass2 due/Release Ass3
8	Data Analytics Applied Techniques and Tools part1	Classification example	
9	Data Analytics Applied Techniques and Tools part2	Clustering example	
10	Final wrap-up	-	Ass3 due

For Students Affected by the Travel Ban

We know some students are currently unable to attend COMP9321 classes because of recent travel restrictions.

Some students have told us they are currently travelling. Some students have told us they are Sydney but can't attend classes because they are self-isolating.

If you can get to UNSW by Feb 28 and can attend your week 3 classes, we look forward to having you in COMPXXXX. Please prepare by Watching the lecture recoding, doing the lab activities on your own time and participate in the online Quizzes.

If you can not travel to UNSW to attend week 3 classes, you unfortunately can not take COMP9321 this term. We can not make sure that you can get the necessary support to complete COMP9321 while being off campus. You will need to change your enrollment.

There is information here to help you with changing your enrolment and other questions and you can contact The Nucleus for more help.

We look forward to seeing you at UNSW when you can travel here.

Supplementary Exam Policy

Supp Exam is only available to students who:

- DID NOT attend the final exam
- Have a good excuse for not attending
- Have documentation for the excuse

Submit special consideration within 72 hours (via myUNSW with supporting docs)

Everybody gets exactly one chance to pass the final exam. For CSE supplementary assessment policy, follow the link in the course outline.

Student Conduct

Please check: https://student.unsw.edu.au/conduct

Questions?