



# Investigation into Post Pandemic Education

Emmett Lawlor  
18238831

John Nelson

LM118: BEng in Electronic and Computer Engineering  
Spring semester 2022 Final Presentation





# Presentation overview

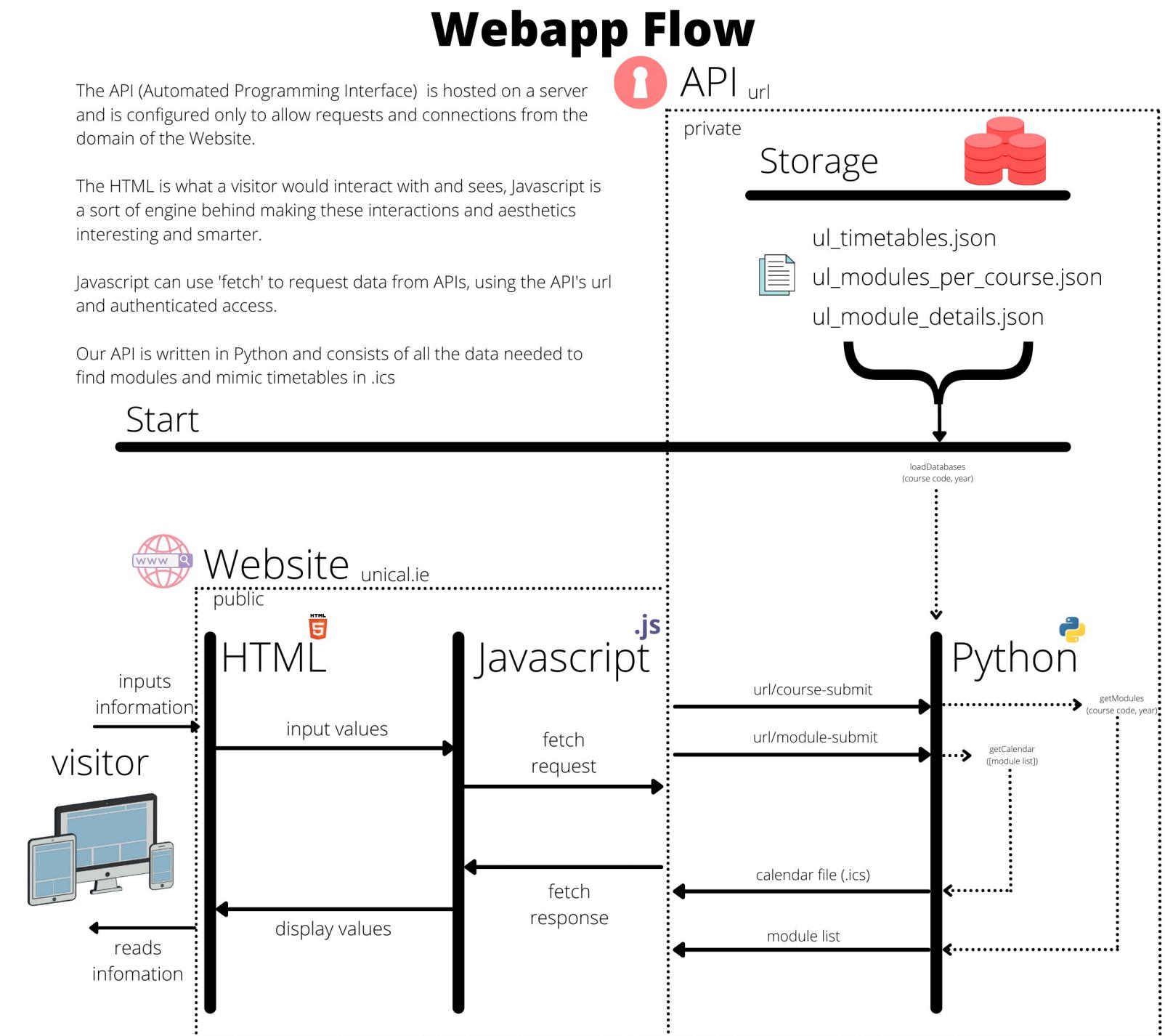
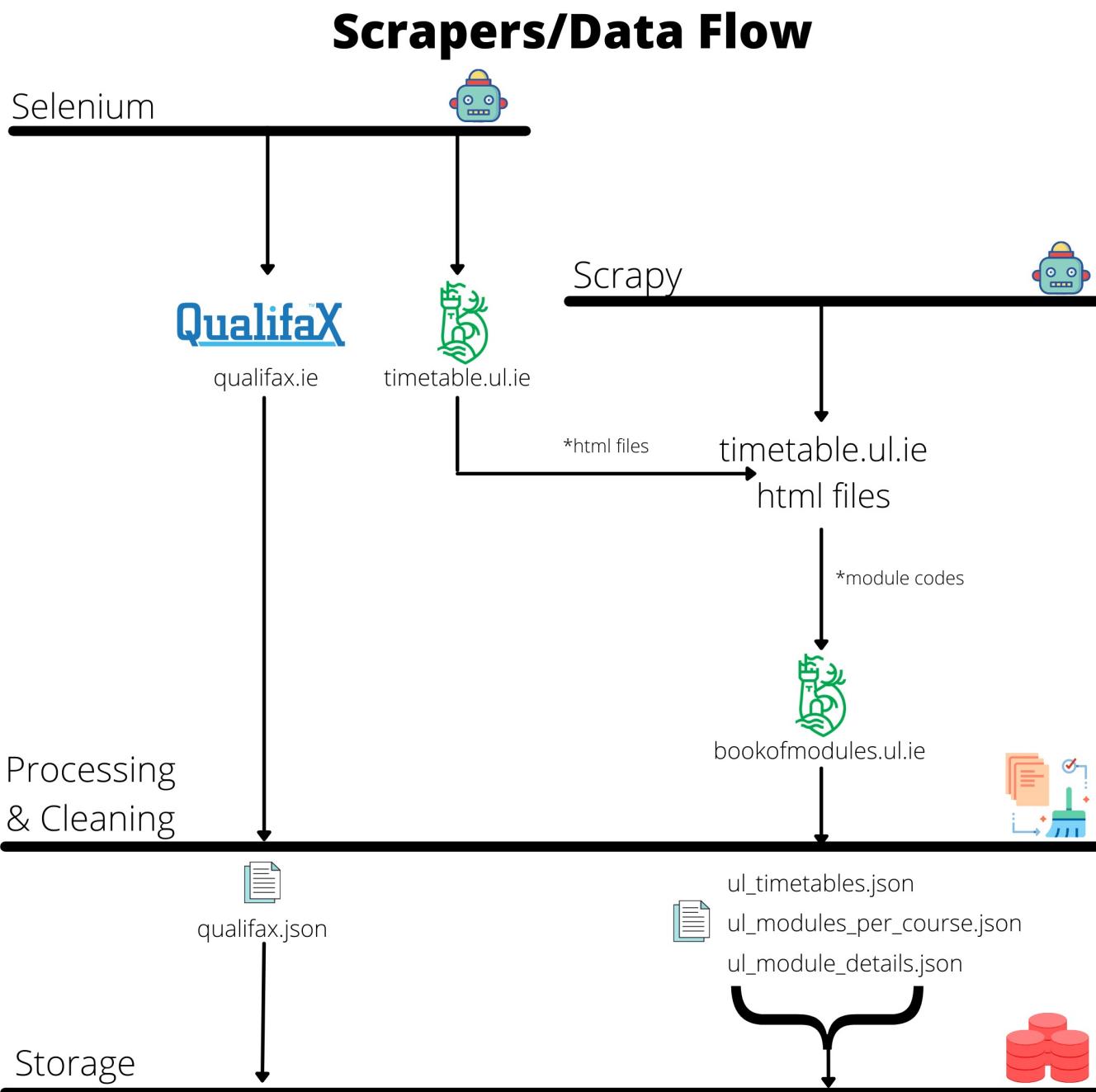
- Overview
- Key Work Dates
- Key results
- Problems and Solutions
- Potential uses of the system and future work
- Demonstration
- Conclusions



# Project overview (1)

- Fully realised method of extracting course data from Qualifax and UL.
  - Using frameworks for Python, I created 2 types of scrapers, which read HTML from webpages and save it in a JSON format for easy indexing and use across internet.
- Fully realised Webapp used almost 600 times over 2 semesters.
  - Using timetable data I could recreate events into a Universal Calendar Format.
- Fully realised an analytical report investigating points data nationally and module data in UL.
  - Using Qualifax, UL and CAO data, I investigated some trends we saw during the pandemic.

# Project overview (2)



# Key work dates

personal_timetable_scraper	
Type:	File folder
Location:	C:\Users\xemme\magi\uinical\backend\toolbox\timetable
Size:	50.6 KB (51,908 bytes)
Size on disk:	76.0 KB (77,824 bytes)
Contains:	19 Files, 3 Folders
Created:	Sunday 22 November 2020, 22:28:47

*Started Personal Timetable Scraper*

selenium_timetable_scraper.py	
Type of file:	PY File (.py)
Opens with:	Visual Studio Code Change...
Location:	C:\Users\xemme\magi\uinical\backend\toolbox\timetable
Size:	4.37 KB (4,483 bytes)
Size on disk:	8.00 KB (8,192 bytes)
Created:	Tuesday 2 February 2021, 23:03:34

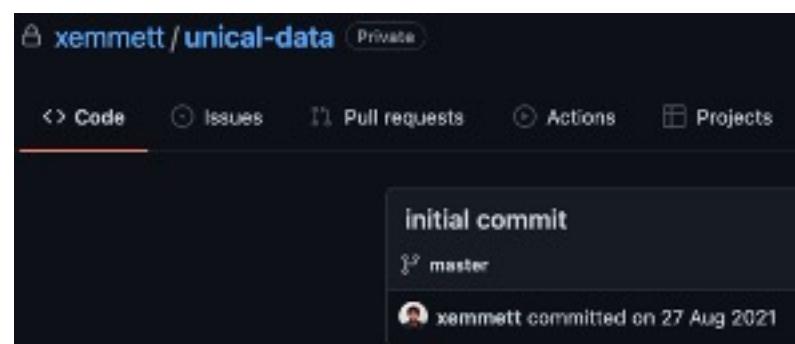
*Started Course Timetable Scraper*

qualifax_scraper	
Type:	File folder
Location:	C:\Users\xemme\fyp\scrapers
Size:	213 MB (224,196,199 bytes)
Size on disk:	213 MB (224,235,520 bytes)
Contains:	29 Files, 5 Folders
Created:	Tuesday 1 June 2021, 23:52:31

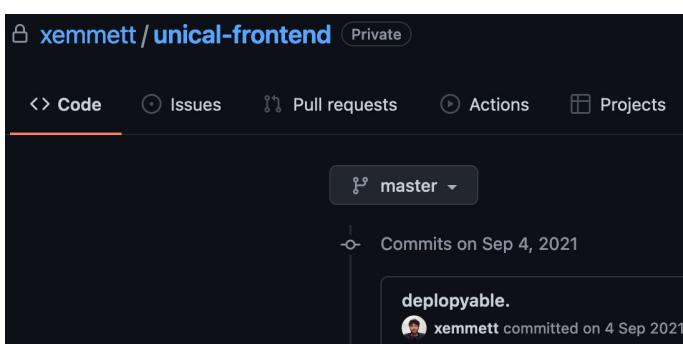
*Started Qualifax Scraper*

cao.ie	
Type:	File folder (.ie)
Location:	C:\Users\xemme\fyp\scrapers
Size:	313 KB (321,099 bytes)
Size on disk:	436 KB (446,464 bytes)
Contains:	59 Files, 3 Folders
Created:	Friday 18 June 2021, 19:44:35

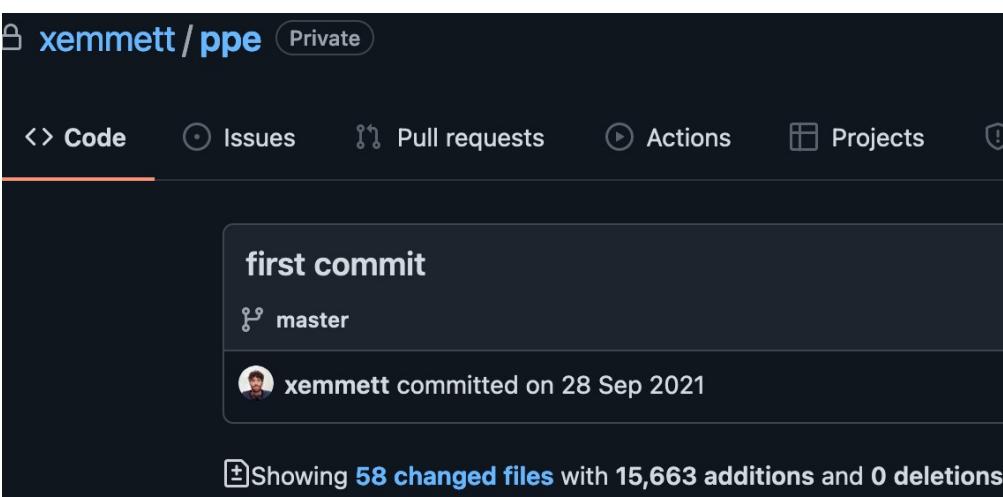
*Started CAO investigation*



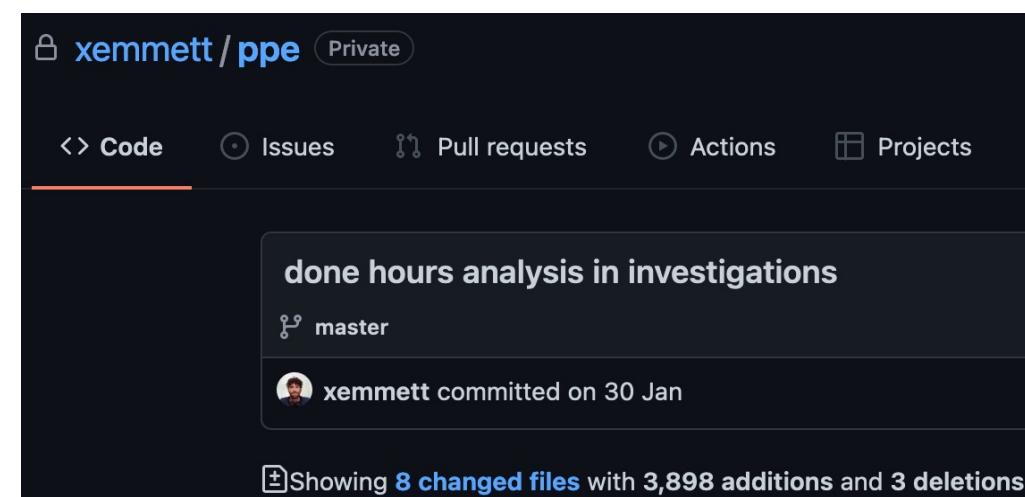
*Deployed Webapp API*



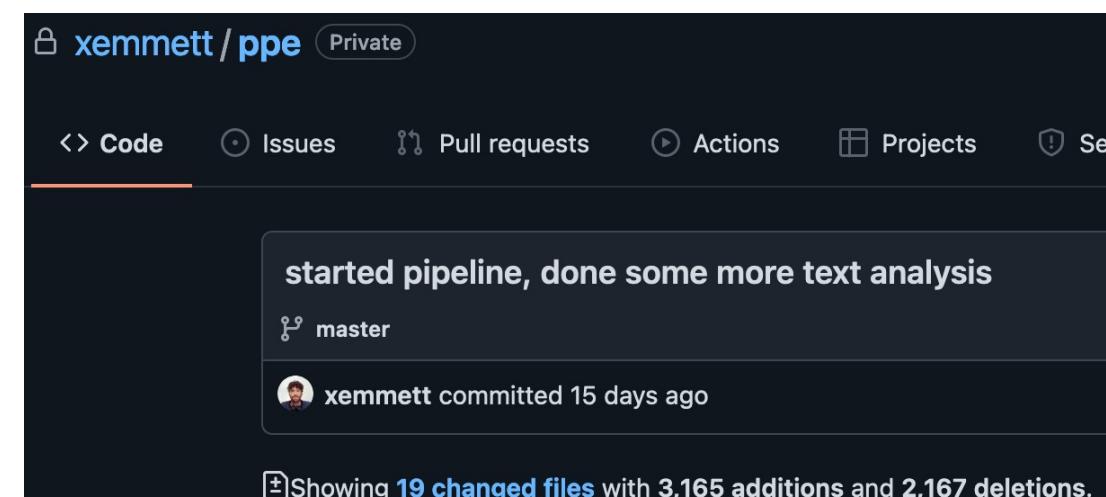
*Deployed Webapp Front-end*



*ppe ~ fyp  
Post Pandemic Education /  
Personal Protective Equipment*



*UL Timetable vs Bookofmodules  
Hours analysis*

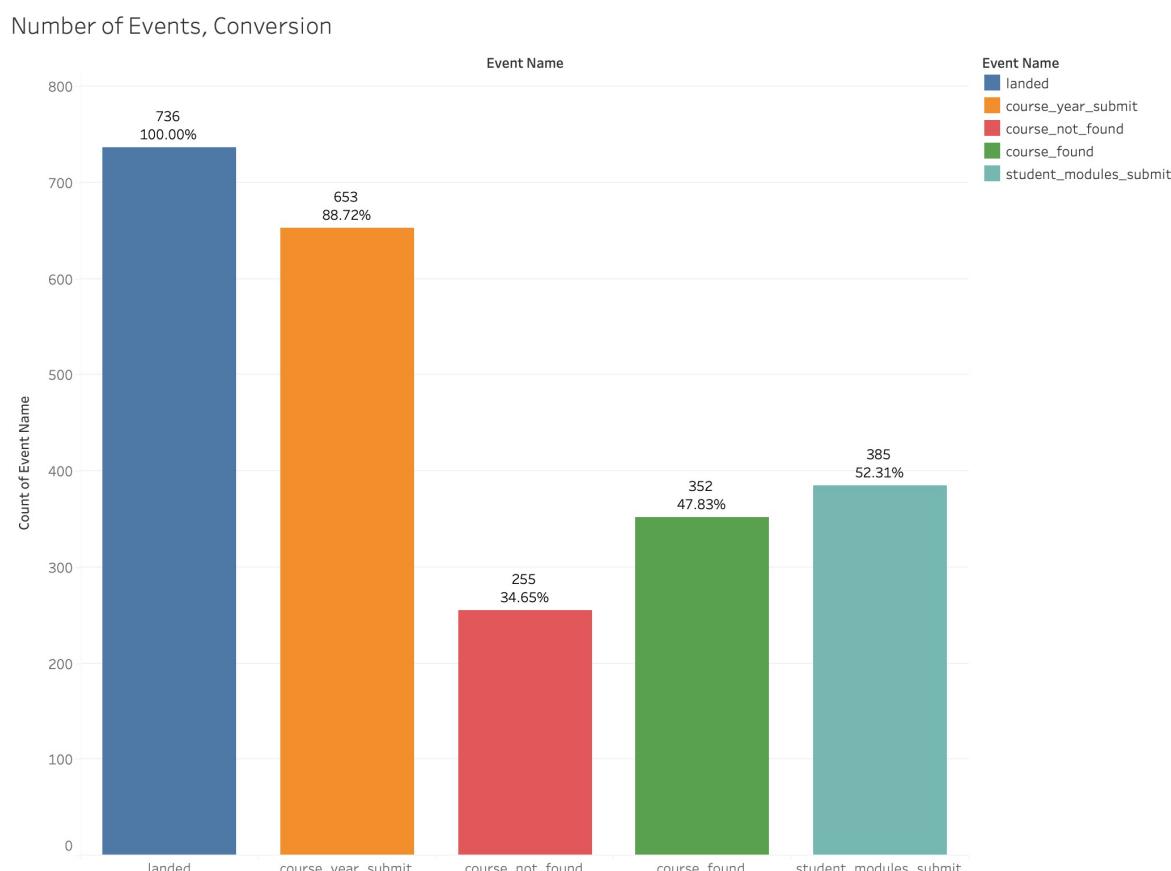


*Axed keyword analysis*

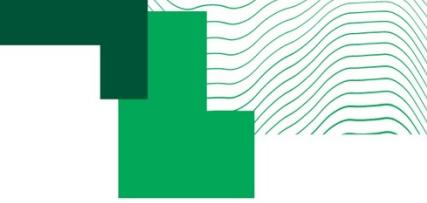
# Key results

Fully functional webapp

The screenshot displays the Unical web application interface. On the left, a sidebar titled "Start Your Semester, Organised and Ready." includes fields for Course Code (Im118), Course Year (4), Student Email (Student ID @studentmail.ul.ie), and a "GET MODULES" button. Below this is a note about mobile compatibility. In the center, a "Create Timetable" section shows a table of modules with their respective groups and professors. The table includes rows for CE4208, EE4032, EE4042, EE6032, PH4042, RE4002, and RE4012. At the bottom are "GENERATE CALENDAR" and "Create Timetable" buttons. On the right, a calendar for March 2022 shows events for RE4012 - LEC on Monday, March 7, at 11:00. The event details include a weekly repeat, an alert, and invitee and note sections.



# Key results



# Extraction of UL data

```
{ ul_course_timetables.json x ... } module_course_details.json x ... ul_module_details.json x
scrapers > ul_scrapers_data2022 > {} ul_course_timetables.json > {} 18 > course_code scrapers > ul_scrapers_data2022 > {} module_course_details.json > {} 18 > course_code
scrapers > ul_scrapers_data2022 > {} ul_course_timetables.json > {} 18 > course_code
7451 { 2420 {
7452   "course_name": "Bachelor of Engineering in 2421   "course_code": "LM118",
7453   "course_code": "Electronic and Computer Engineering", 2422   "course_year": 4,
7454   "course_year": "4", 2423   "classes": [
7455   "class": [ 2424     {
7456     "day": 0, 2425       "professor": "Clancy Ian Dr",
7457     "professor": "CLANCY IAN DR", 2426       "module": "PH4042",
7458     "module": "PH4042", 2427       "group": "3A"
7459     "group": "3A", 2428   },
7460     "delivery": "TUT", 2429   {
7461     "location": "ERB007", 2430     "professor": "Dojen Reiner Dr",
7462     "active_weeks": [ 2431     "module": "CE4208",
7463       "start_time": "09:00", 2432     "group": "2A"
7464       "end_time": "10:00", 2433   },
7465     ], 2434   {
7466     "start_time": "09:00", 2435     "professor": "Newe Tom Dr",
7467     "end_time": "10:00", 2436     "module": "EE6032",
7468   }, 2437     "group": "3A"
7469   }, 2438   },
7470   { 2439   {
7471     "day": 0, 2440     "professor": "Eising Ciarán Dr M
7472     "professor": "DOJEN REINER DR", 2441     "module": "EE4052",
7473     "module": "CE4208", 2442     "group": "Null"
7474     "group": "2A", 2443   },
7475     "delivery": "LAB", 2444   {
7476     "location": "B2042", 2445     "professor": "Toal Daniel Professor",
7477     "active_weeks": [ 2446     "module": "RE4002",
7478       "1-11", 2447     "group": "3A"
7479       "13" 2448   },
7449   }
```

## Extraction of Qualifax data

```
{  
    "course_name": "Engineering – Electronic and Computer Engineering",  
    "course_provider": "University of Limerick",  
    "course_code": "LM118",  
    "course_type": "Higher Education CAO",  
    "qualifications": {  
        "award_name": "Degree – Honours Bachelor (Level 8 NFQ)\nMore info...",  
        "nfq_classification": "Major",  
        "awarding_body": "University of Limerick",  
        "nfq_level": "Level 8 NFQ"  
    },  
    "apply_to": "CAO",  
    "attendance_options": "Full time, Daytime",  
    "location_(districts)": "Limerick City",  
    "qualification_letters": "BEng (Hons)",  
    "duration": "4 years",  
    "specific_subjects_or_course_requirements": "Min requirements: 2 H5 and 4 O6/H7\nEnglish: C",  
    "leaving_certificate_general_entry_requirements": "Irish Leaving Certificate Applicants\n\n",  
    "leaving_certificate_vocational_programme_lcvp": "For the purpose of satisfying minimum entry requirements, applicants must have obtained a minimum of 2 H5 and 4 O6/H7 grades at the Irish Leaving Certificate examination.",  
    "qqi_fet_applicants_general_information": "QQI Pathways",  
    "qqi_fet_entry_requirements": "http://www.cao.ie/index.php?page=fetac\_search",  
    "mature_applicants": "Applications are particularly welcome from mature candidates (at least 21 years old) who have relevant work experience."  
}
```

# Key results



## Possibility for inflation in Third Level

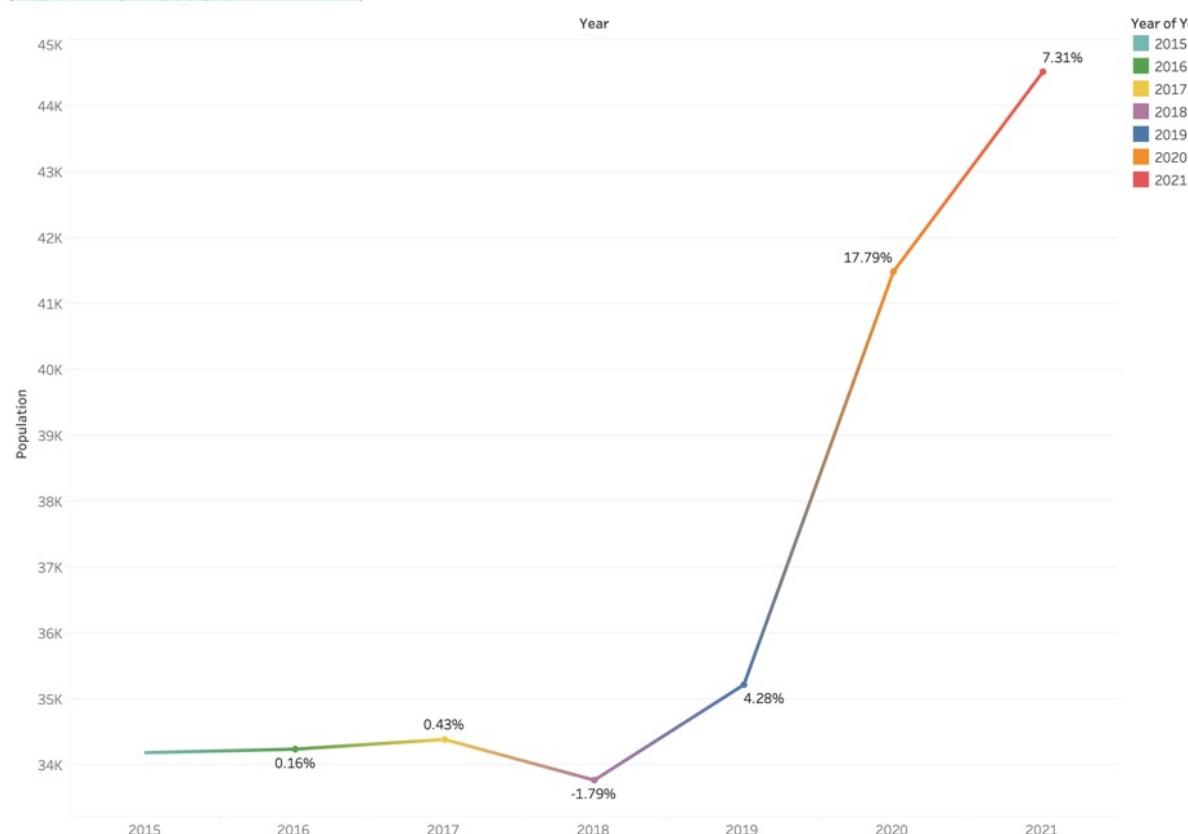
### Asking Points for CAO courses (qualifax.ie)

Avg. Points.2018 331.065

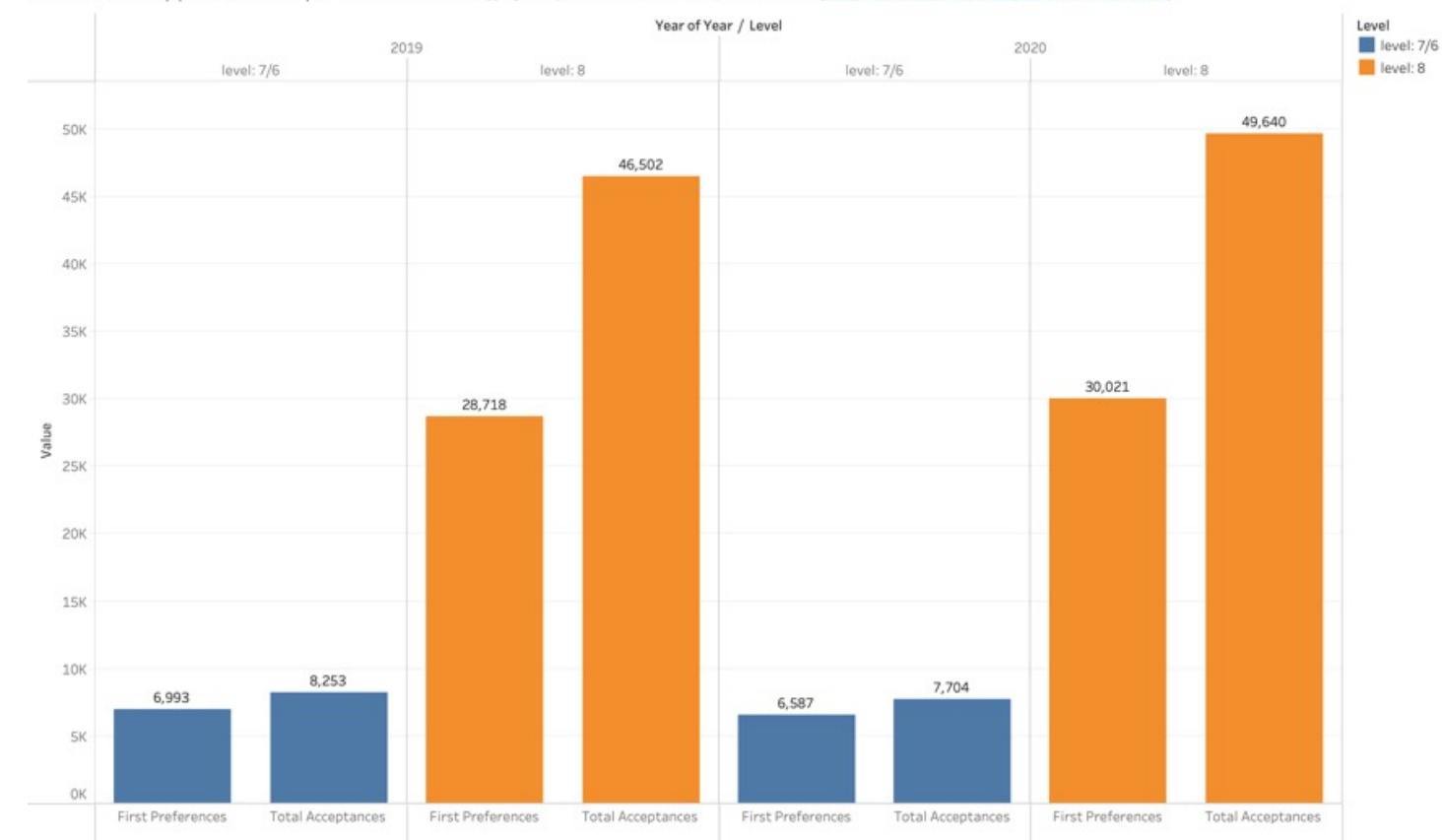
Avg. Points 2019 326.07

Avg. Points 2020 335.91

Population acheiving >300 in LC cao statistics, aggregated by Emmett Lawlor from Acceptance Statistics (<http://www.cao.ie/index.php?page=points&bb=mediastats>)



Number of Applicant Acceptances cao statistics, aggregated by Emmett Lawlor from Acceptance Statistics (<http://www.cao.ie/index.php?page=points&bb=mediastats>)





# Problems and solutions

- Sources from CAO being in PDF tabular form.
  - Tabula framework for Python.
- Inconsistent Data across sources.
  - UL, CAO both had conflicting data.
- Textual Analysis.
  - More questions than answers.
  - Information format and consistency.
- UL CyberSecurity.
  - Removed password entry to webapp



# Potential uses of the system and future work

- Course competitiveness.
  - Utilising scrapers and analysing external sources like Qualifax, institutions can find a competitive edge over other courses or districts, what to offer etc.
- A new hub for integrated tools.
  - Allowing students to create web applications such as the one in this project, under a institution framework with special accesses such as log-in using Institution portal. Institutions could have a flood of resources available, built by students for students or lecturers.
- Deter drop-outs, increase quality of student life.
  - By creating custom tools wrapped around data like Qualifax (course description data), we could build tools to help hopeful students find the right course.
  - By streamlining student tool creation, students can have newer ways of keeping their digital and physical academic life in check, in ways unknown to corporate software creators.
  - Helping students find the ideal course and structure around it, we can make a very stressful period in life easier.



# Demonstration

- Demonstration of Web Application.
  - Will demonstrate flow
  - How various aspects were completed.
  - Evolution.



# Conclusions

- Quality of code progression.
- Third levels beware of strain on institution and community resources.
- A need for organisation and formatting of documents.



**Thank you.  
Any questions?**



University of Limerick,  
Limerick, V94 T9PX,  
Ireland.  
Ollscoil Luimnigh,  
Luimneach,  
V94 T9PX, Éire.  
+353 (0) 61 202020

[ul.ie](http://ul.ie)