



CSCI 5408 – Data Management, Warehousing, Analytics

Assignment 1

Work done by,

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DECLARATION

I, Guturu Rama Mohan Vishnu, declare that in assignment 1 of CSCI 5408 course, data scrapping is not done programmatically or using any online or offline tools. However, the webpages or the domain mentioned in this document are visited manually, and some useful information is gathered for education purpose only. Information, such as email, personal contact numbers, or names of people are not extracted. The course instructor or the Faculty of Computer Science cannot be held responsible for any misuse of the extracted data.

Problem #1: Halifax City Universities

Solution:

After exploring the three university websites, the list of 30 entity sets that I believe would be good enough to make a good data model are listed below.

Entity	Reasons for considering	Source
Alumni	Alumni is a person who previously graduated from the university. It is a strong entity since it doesn't depend on any other entities for it to exist. It contains all the information of former students, staff and other individuals.	Information has been taken from https://alumni.dal.ca/ , https://www.msvu.ca/alumni-donors/recent-graduate/ , https://www.smu.ca/alumni/alumni-events.html
Libraries	This entity represents the collection of books, study materials, having access to computers and so on. It is a strong entity since it doesn't depend on any other entities and every book or system in the library has a unique ID by which we can identity the item.	Information has been taken from https://libraries.dal.ca/ , https://www.msvu.ca/academics/library/ , https://www.smu.ca/academics/the-patrick-power-library.html
Admissions	Admissions entity is responsible for all the admission applications, their statuses, details of how to apply for any program and the requirements etc. It is a strong entity since it doesn't depend on any entity and it can also be called as a super entity.	Information has been taken from https://www.dal.ca/admissions.html , https://www.msvu.ca/future-students/admission-requirements/ , https://www.smu.ca/future-students/cs-admission-requirements.html
Academic programs	Academics section, a weak entity, responsible for all the programs and	Information has been taken from

	courses taught in the university. It gives all the information regarding the course structures, subjects, topics for various levels like undergraduate, graduate and professional level.	https://www.dal.ca/academics.html , https://www.msvu.ca/academics/ , https://www.smu.ca/academics/
Campuses	This is a strong entity which gives the information of where different campuses of the university are located. This entity doesn't depend on any other entity. For ex, in case of Dalhousie, we have two campuses Truro and Halifax campus.	Information has been taken from https://www.dal.ca/about-dal/agricultural-campus.html
Campus map	It provides a map of a certain campus as well as information about the area. This is a weak entity due to the reason that this entity depends on campuses.	Information has been taken from https://www.smu.ca/campus-life/campus-map.html , https://www.msvu.ca/campus-life/campus-services/safety-security-at-msvu/campus-map/ , https://www.smu.ca/campus-life/campus-map.html
Department	This can be considered as a parent key of academic programs. For example, Bachelor of Science has programs like Statistics, Biology, Computer Science, Mathematics and so on. Since it doesn't depend on program entity, this can be labelled as a strong entity.	Information has been taken from https://www.msvu.ca/academics/bachelor-of-science-bsc/ , https://www.smu.ca/academics/academic-programs-landing.html , https://www.dal.ca/academics/programs.html
Residence	Residence is a strong entity. The halls are available on every campus for students and staff to stay. The name of each	Information has been taken from https://www.smu.ca/campus-life/residences-and-

	residence on campus can be used to identify it.	housing.html , https://www.dal.ca/campus_life/residence_housing/residence.html , https://www.msvu.ca/campus-life/residence-life-at-the-mount/
Current Students	A student is a person who is pursuing 1 or more courses on some level at the university. Every student has got a unique banner id which starts with B00. Hence this is a strong entity.	Information has been taken from https://www.dal.ca/current_students.html , https://www.smu.ca/fgsr/fgsr-current-students.html
Parking	This entity has the data of the types of parking available, the fare of different types and the available zones in the parking. Here, parking number acts as unique ID for each parking and hence, this is a strong entity.	Information has been taken from https://www.msvu.ca/campus-life/campus-services/parking/ , https://www.dal.ca/campus_life/residence_housing/residence/halifax-campus/living-in-residence/parking.html , https://www.smu.ca/about/facilities-parking.html
Student Union	The student executive, council, managers, staff and volunteers working inside the Student Union aim to make best decisions regarding what the general student body needs from them. This entity depends on student entity, hence it is a weak entity.	Information has been taken from https://www.msvu.ca/campus-life/students-union/ , https://www.dal.ca/campus-maps/building-directory/studley-campus/sub.html
News & Events	It is a strong entity. It gathers all the information that the students and staff need to know and keeps updating it every	Information has been taken from

	day. Every news article is going to have a separate ID for it.	https://www.msvu.ca/alumni-donors/news-events/ , https://www.dal.ca/news.html , https://www.smu.ca/research/ilo-news-and-events.html
Dal magazine	University magazine contains essays, poems, stories, photographs, paintings, drawings in a particular area such as hobbies or sports, typically by the students of the university or the staff. Every magazine has a unique ID and it is a strong entity.	Information has been taken from https://dalmag.dal.ca/ , https://www.msvu.ca/alumni-donors/news-events/magazine-foia-montana/
Dal card	This is an id card for all the students to prove their enrollment in the university. It has a banner id on it which is unique for every student. Since this depends on student entity, it is a weak entity.	Information has been taken from https://www.dal.ca/campus_life/Dalcard.html , https://www.msvu.ca/academics/library/services/library-distance-services/request-update-an-id-card-online-form/ , https://www.smu.ca/academics/borrow-our-materials.html#d.en.52357
Dal store	This is a one-stop-go for everyone who aims to buy books, clothes, electronics, bags, stationery, gifts and almost everything. This is a strong entity.	Information has been taken from https://bookstore.dal.ca/ , https://shop.smu.ca/?_ga=2.244508097.512931377.1642978819-1581999480.1642545340 , https://www.msvu.ca

		/campus-life/campus-services/the-mount-bookstore/
Faculty	A faculty is an individual who teaches 1 or more classes in the university. Faculty is a strong entity and they can be recognized by their unique email id since there are multiple faculties under multiple departments.	Information has been taken from https://www.dal.ca/faculty_staff.html , https://www.msvu.ca/welcoming-new-faculty-fall-2021/ , https://www.smu.ca/fgsr/faculty-and-staff.html
Athletics & Recreation	This is responsible for having all the extra - curricular activities like swimming pool, gym, tennis court etc. This is a weak entity since if there is no campus, there are no amenities.	Information has been taken from https://athletics.dal.ca/ , https://www.smu.ca/campus-life/athletics-and-recreation.html , https://www.msvu.ca/campus-life/athletics-home-of-the-mount-mystics/
Student Health & Wellness	This entity is responsible for helping the students for their mental health and their wellness whenever needed. This is a weak entity since it depends on the student entity.	Information has been taken from https://www.dal.ca/campus_life/health-and-wellness.html , https://www.smu.ca/campus-life/the-student-health-services-clinic.html , https://www.msvu.ca/campus-life/health-wellness-services/
Food court	This entity holds responsible for hosting all the food stalls, coffee shops, restaurants on the campus.	Information has been taken from https://www.dal.ca/dept/ancillary-

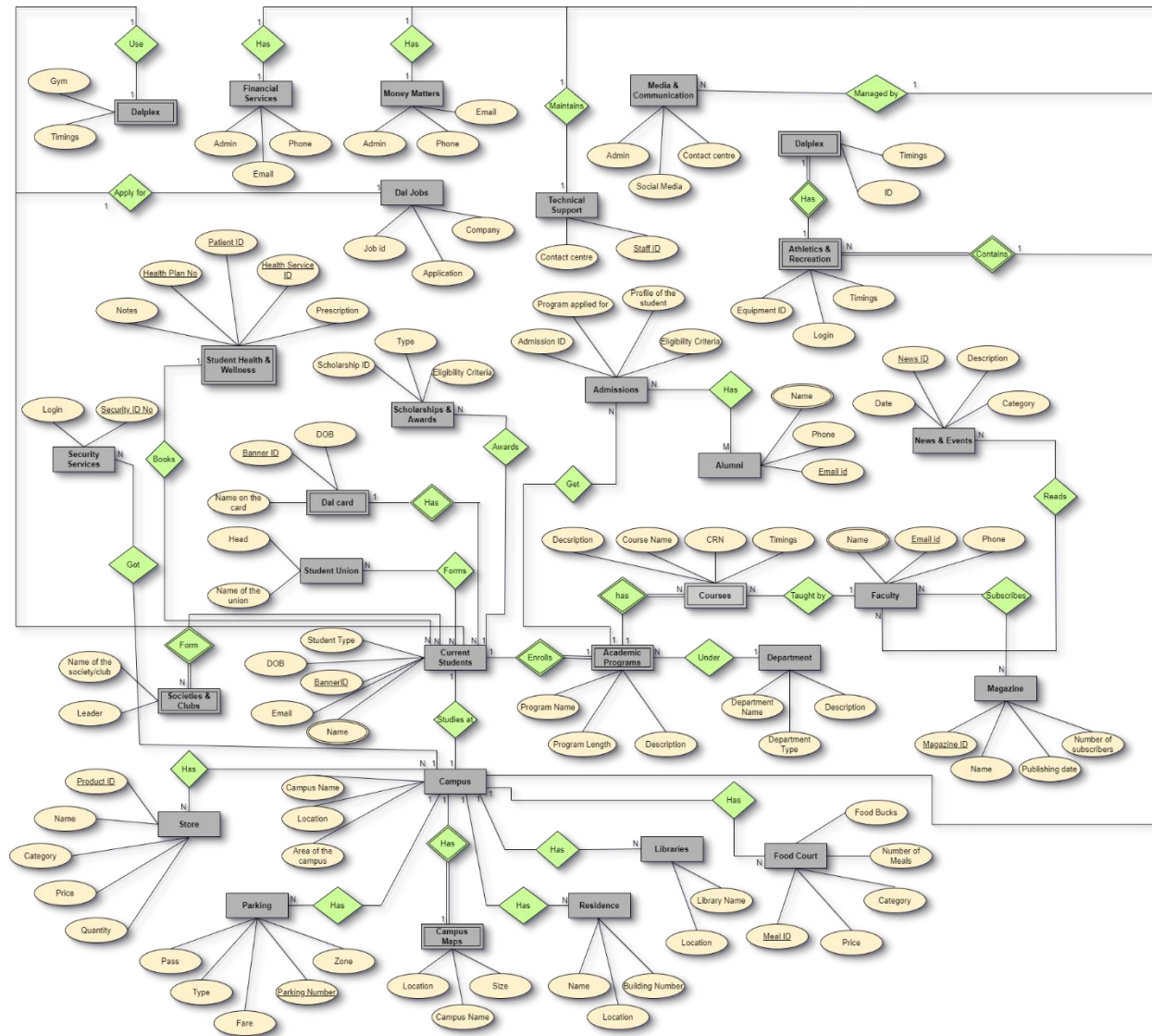
		services/services/food-services.html , https://www.smu.ca/campus-life/meal-plans-and-food-options.html , https://www.msvu.ca/campus-life/residence-life-at-the-mount/dining-on-campus-with-chartwells/
Societies & Clubs	<p>These are multiple clubs and societies hosted by students in the university. Without students, these clubs wouldn't make sense. So, they are weak entity.</p>	<p>Information has been taken from</p> https://www.msvu.ca/international/advising-for-current-international-students/international-clubs-societies/ , https://dal.ca.libguides.com/c.php?g=257195&p=1717219 , https://www.smu.ca/blackstudent/societies-groups.html
Security Services	<p>The security services are the ones who guard the university of any damage or theft or any misconduct by the students or any other individuals from outside the university. It is a strong entity.</p>	<p>Information has been taken from</p> https://www.smu.ca/campus-life/university-security.html , https://www.dal.ca/dept/facilities/services/security-services.html , https://www.msvu.ca/campus-life/campus-services/safety-security-at-msvu/
Financial Services	<p>Finance services are the people who students talk to regarding money matters.</p>	<p>Information has been taken from</p>

	It is an independent unit, so it is a strong entity.	https://www.dal.ca/dept/financial-services.html , https://www.msvu.ca/future-students/money-matters/tuition-fees/financial-information-policies/ , https://www.smu.ca/about/policies-and-procedures-financial-services.html
Media & Communication	Communications, Marketing & Creative Services (CMC) works with the university community to provide direction that aligns with the universities strategic policies. They offer a number of communications, marketing and creative resources across the university. It is a strong entity.	Information has been taken from https://www.dal.ca/dept/cmc.html , https://www.smu.ca/communications/mediarelations/ , https://www.msvu.ca/about-msvu/contact-msvu/
Dal Tigers	A weak entity dependent on students, is a sport team representing the university.	Information has been taken from https://www.daltigers.ca/landing/index , https://www.smu.ca/campus-life/smufit-camp-boys-basketball.html , https://www.msvu.ca/about-msvu/event-calendar/residence-intramural-basketball/
Courses	Academic programs come under Department. Courses come under Academic programs and so, it is a weak	Information has been taken from

	entity. Courses are like DMWA, ASDC, SDC etc.	https://www.dal.ca/faculty/agriculture/extended-learning/Courses.html , https://www.msvu.ca/academics/bachelor-of-science-bsc/computer-science/courses/ , https://smu-ca-public.courseleaf.com/undergraduate/courses-az/csci/
Technical Support	This team is there to help anyone who needs tech support regarding their accessories. Since it doesn't depend on anything, it is a strong entity.	Information has been taken from https://ppm.smu.ca/TDClient/34/Portal/Home/?ga=2.174772714.933595149.1642545340-1581999480.1642545340 , https://www.dal.ca/faculty/computer-science/about/technical-services.html , https://www.msvu.ca/campus-life/campus-services/it-services/multimedia-services/
Money matters	Finances are a major factor that can impact one's decision of choosing a university. Expenses vary depending on the lifestyle of the student and level of enrollment. It is a strong entity.	Information has been taken from https://www.dal.ca/admissions/money-matters/tuition-payments/Tuition_Fees.html , https://www.smu.ca/future-students/money-

		matters.html , https://www.msvu.ca/future-students/money-matters/
Scholarships & Awards	Scholarships and Awards are given to people who excel in academics in their respective courses or departments. It is a strong entity.	Information has been taken from https://www.smu.ca/fgsr/fgsr-future-scholarships-and-awards.html , https://www.dal.ca/faculty/engineering/u-s-o/current-students/eng-scholarships.html , https://www.dal.ca/faculty/engineering/u-s-o/current-students/eng-scholarships.html
Dalplex	Dalplex has many facilities which are available to any level of the university students or staff or faculty. It is a weak entity since it is dependent on athletics and recreation.	Information has been taken from https://athletics.dal.ca/facilities/Dalplex.html
Dal Jobs	Campus placements, mock interviews, internship preparations and other helpful stuff are available for the students to increase their chances of a job. It is a strong entity.	Information has been taken from https://dal.peopleadmin.ca/ , https://www.smu.ca/academics/departments/ids-internships-jobs-and-volunteer.html , https://www.msvu.ca/academics/co-operative-education-at-the-mount/

INITIAL ENTITY RELATIONSHIP DIAGRAM:



The issues I found in this ERD with solution:

- The term “Alumni” refers to a broad category of people. So, we can again divide it in to further categories like Students and Staff.
- Admissions and Alumni have the cardinality of N and M. This is wrong since one alumni might not have studied more than 1 program. Since it should be 1 : N relationship.
- Academic Programs and Admissions have 1 : N relationship. But there can be cases in which an applicant can apply to more than 1 academic program to get a seat in any one of it. So it should be M : N relationship.
- Dalplex and Athletics & Recreation are being made as two different entities. We can consider Dalplex to be a part of Athletics entity and write it off as an attribute.
- Faculty and Alumni entities have been missing an attribute which can be considered as unique. The attributes phone number, email id and name cannot be unique in some very rare cases.

FINAL ENTITY RELATIONSHIP DIAGRAM:

