

Systems Design Engineering 2019 Class Profile

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Foreword

Systems Design Engineering (SYDE) is an engineering program unique to the University of Waterloo. Over the past 5 years, the class of 2019 spent 8 semesters in school together and completed 6 technical co-op work terms. The curriculum was interdisciplinary and covered a wide breadth of material, including courses from mechanical, electrical, and software engineering that were tied together with a design-focused curriculum.

This document extends the results of the SYDE 2017 and SYDE 2018 Class Profiles and aims to capture the story of the SYDE class of 2019. Because of its holistic and interdisciplinary nature, SYDE often means different things to different people. Through this survey, we hope to share our unique SYDE experience.



Analysts' Note

55 of 73 students (75%) are represented in this survey. Throughout the survey, any reference to “the class” carries the underlying assumption that this subset of respondents accurately represents our entire class. The results of this profile do not extend beyond the experiences of the respondents from the SYDE class of 2019 and the data does not necessarily generalize to other university students, nor even other SYDE cohorts. These results do not aim to make any inferences about a larger population, and attempt only to represent the class as it was.

The terms 1A, 1B, 2A, etc. refer to the semester of study, the number indicating the year and A or B indicating the first or second term. Co-op terms alternated with school terms and are denoted by a C following the semester the internship followed after (e.g. 2AC co-op refers to the internship term after the 2A semester). The SYDE class of 2019 started school in September 2014, making that the 1A term.

Any analysis involving money is expressed in Canadian dollars. The exchange rate used to convert from USD to CAD was 1.3 and was selected as a reasonable mean exchange rate over the relevant duration.

The class profile was conducted by SYDE students independent of the department, faculty, and university.

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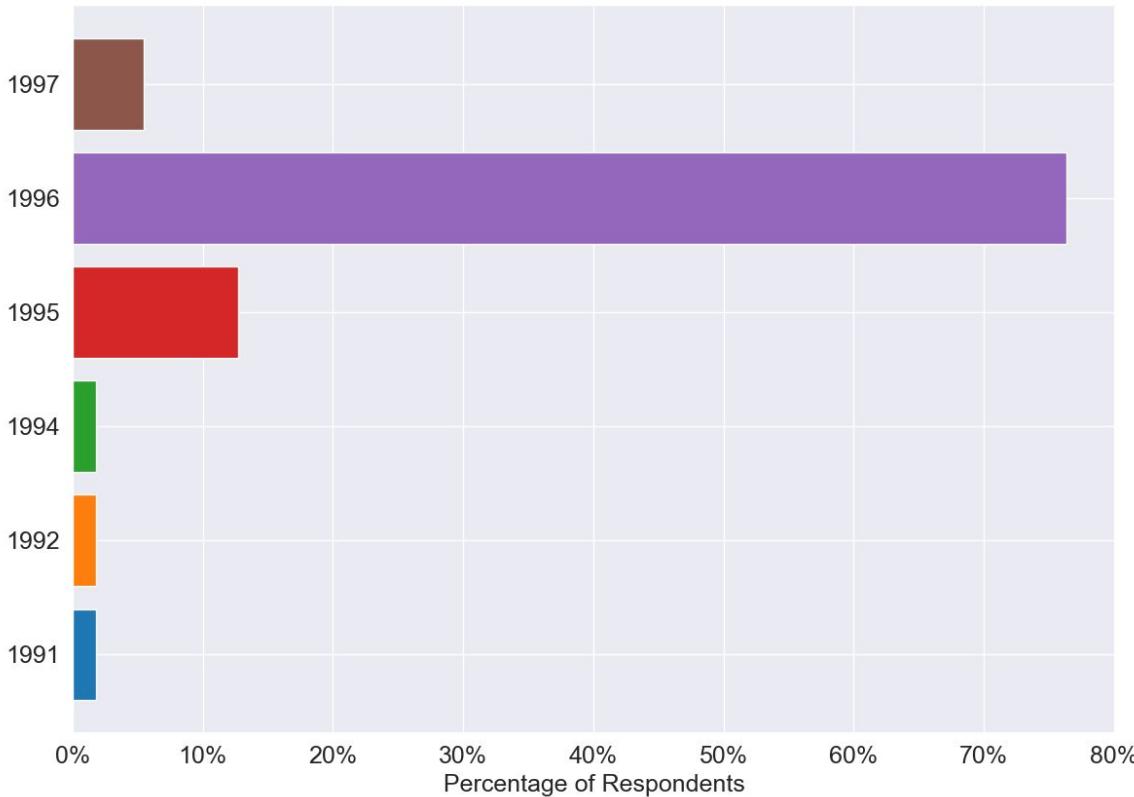
The Future: Jobs, Salaries, Brain Drain, Pay Gap, Life Plans --> Slide 97 - 119

Demographics

Home, Family, High School, and more

Demographics: Birth year

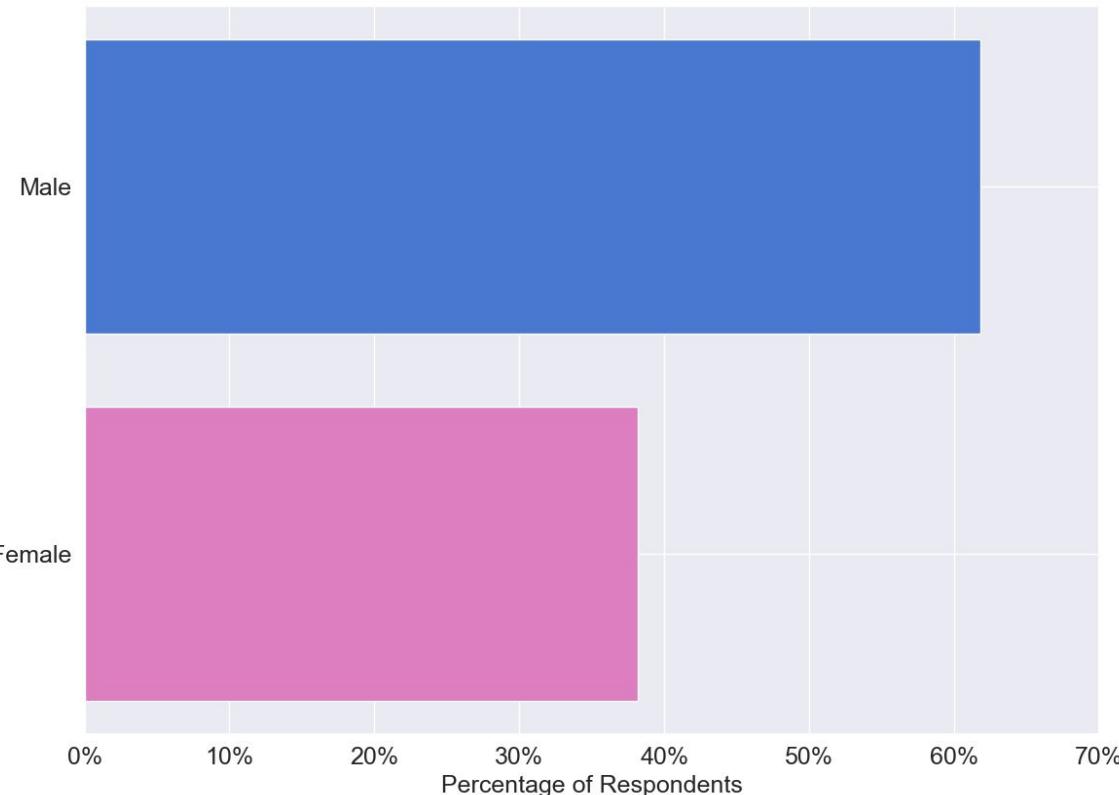
What year were you born in?



The mean, median, and mode birth year of respondents was 1996.

Demographics: Gender

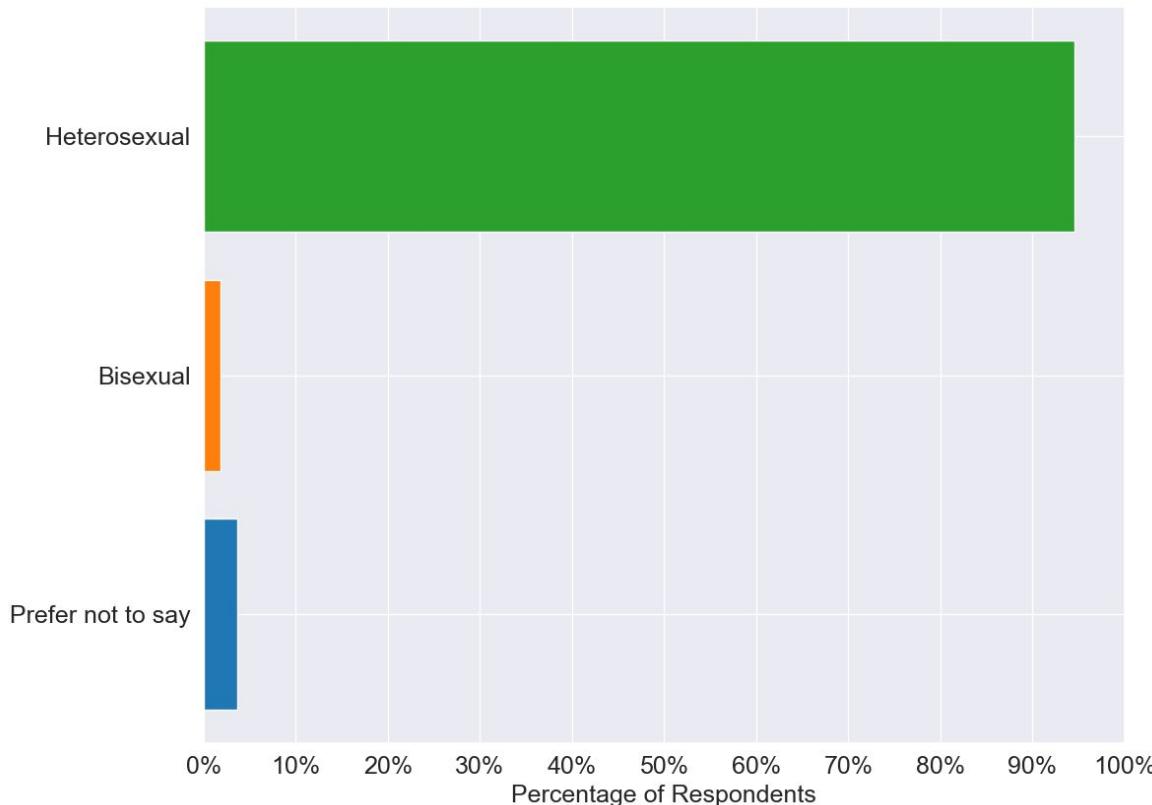
What gender do you identify with?



62% of the class was male and
38% was female.

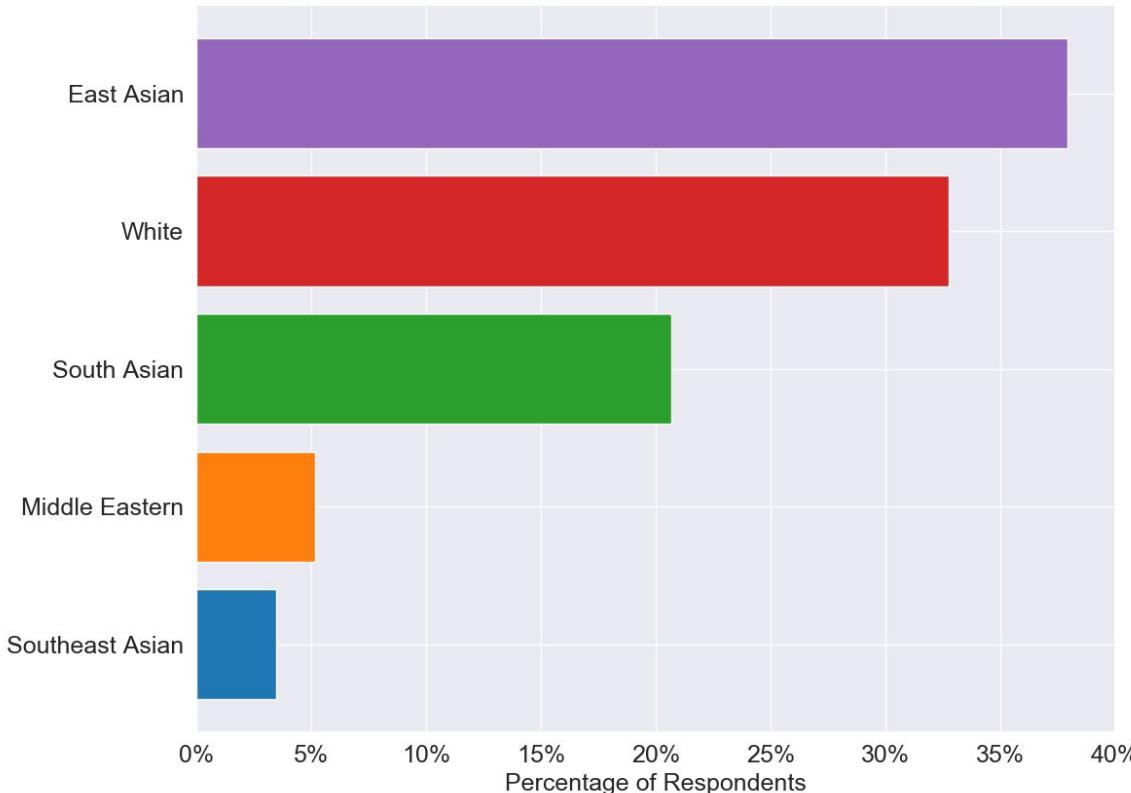
Demographics: Sexuality

What sexuality do you identify with?



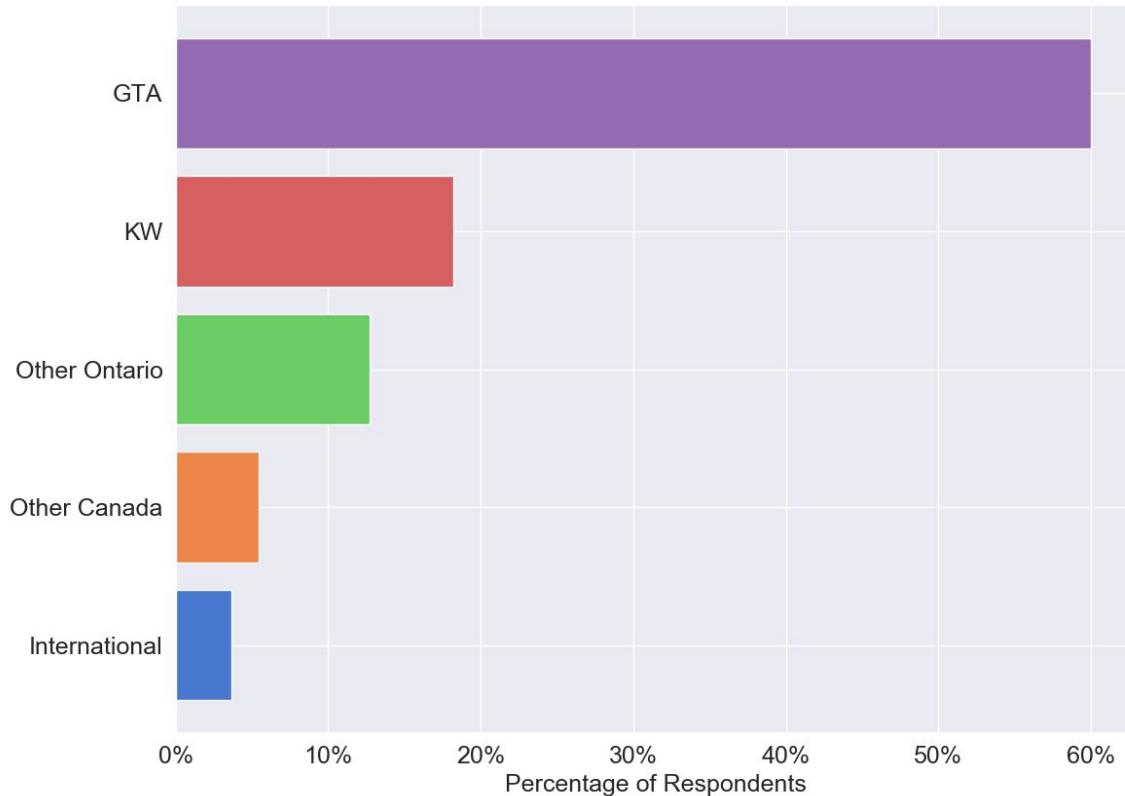
Demographics: Ethnicity

Which ethnic background(s) do you identify with?



Demographics: Where did you grow up?

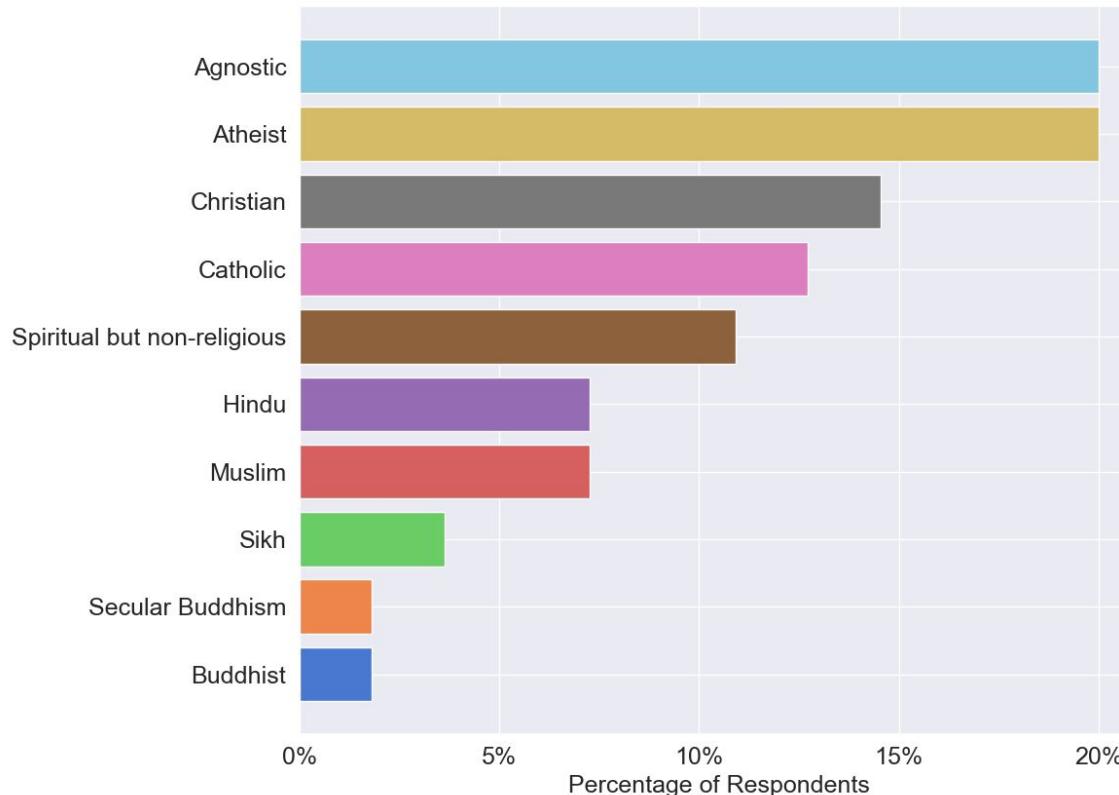
Where did you grow up?



The majority of respondents grew up in some part of Canada, with over half of the respondents growing up in the GTA.

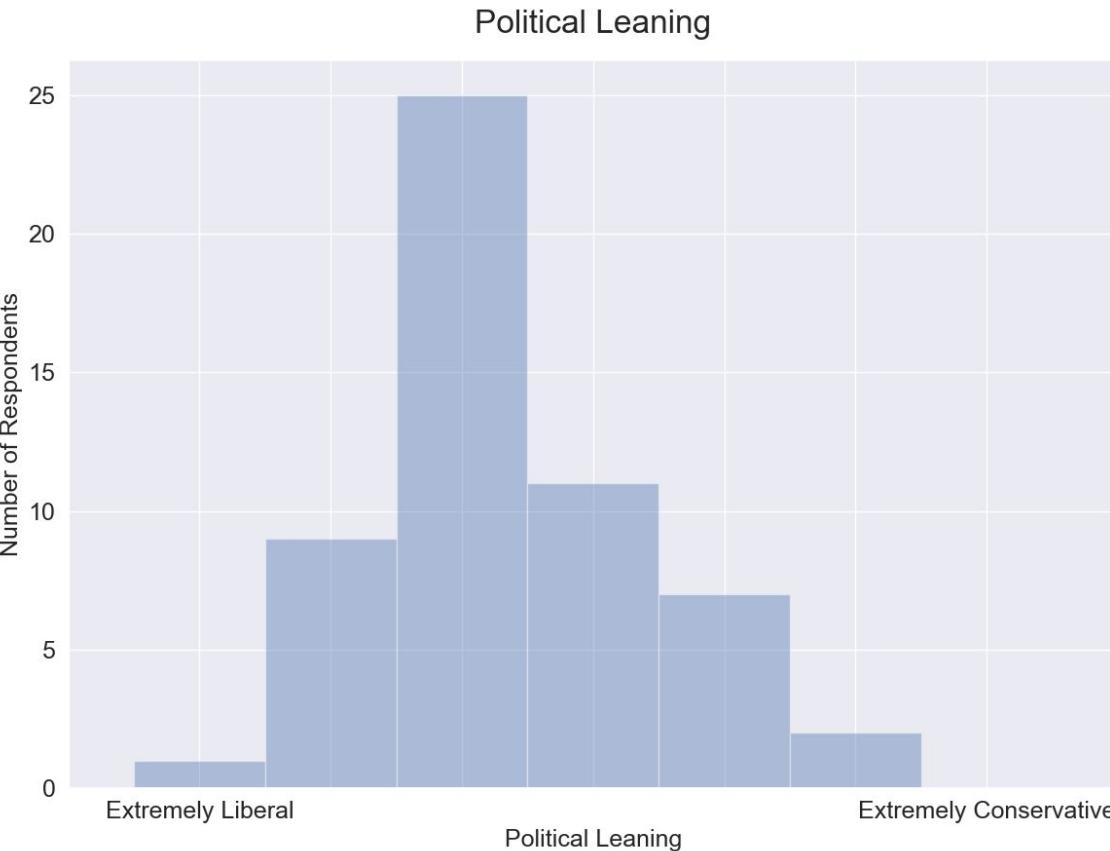
Demographics: Religion

What is your religious school of thought?



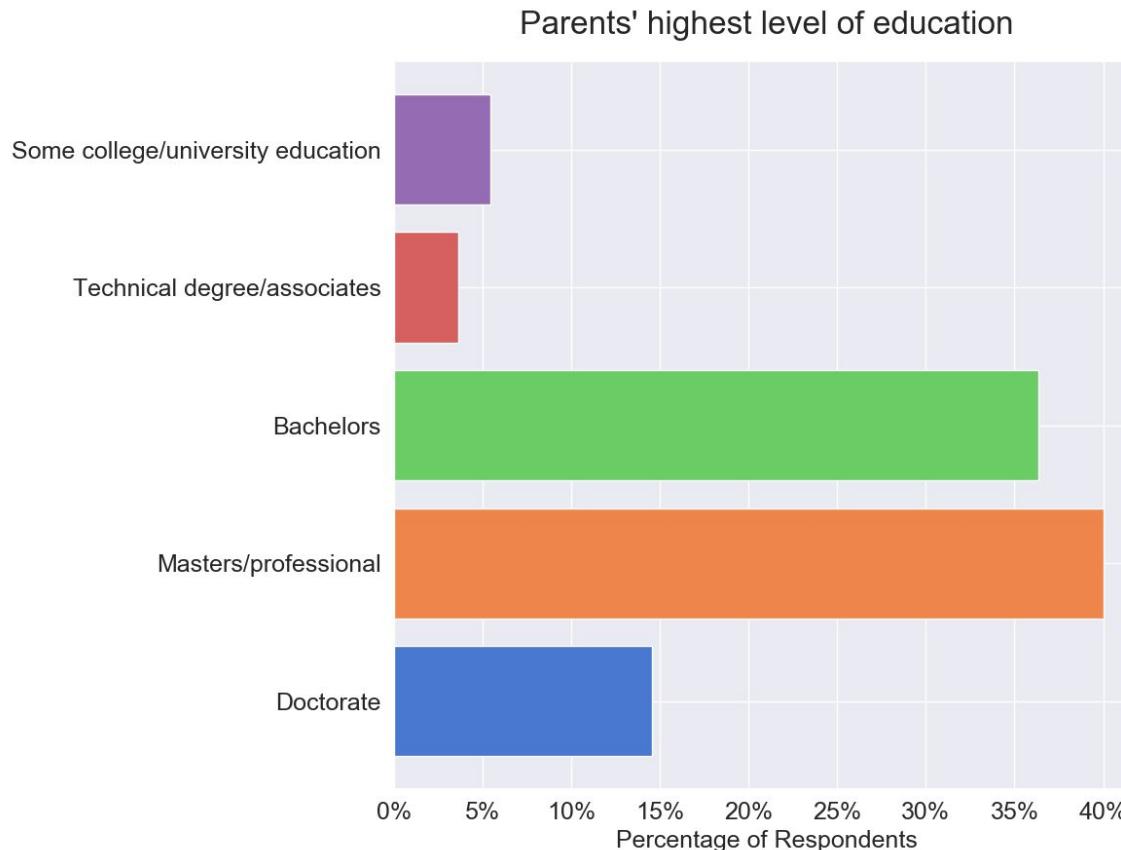
Most of the class believes in something.

Demographics: Political Leaning



The class seems to be slightly left-leaning.

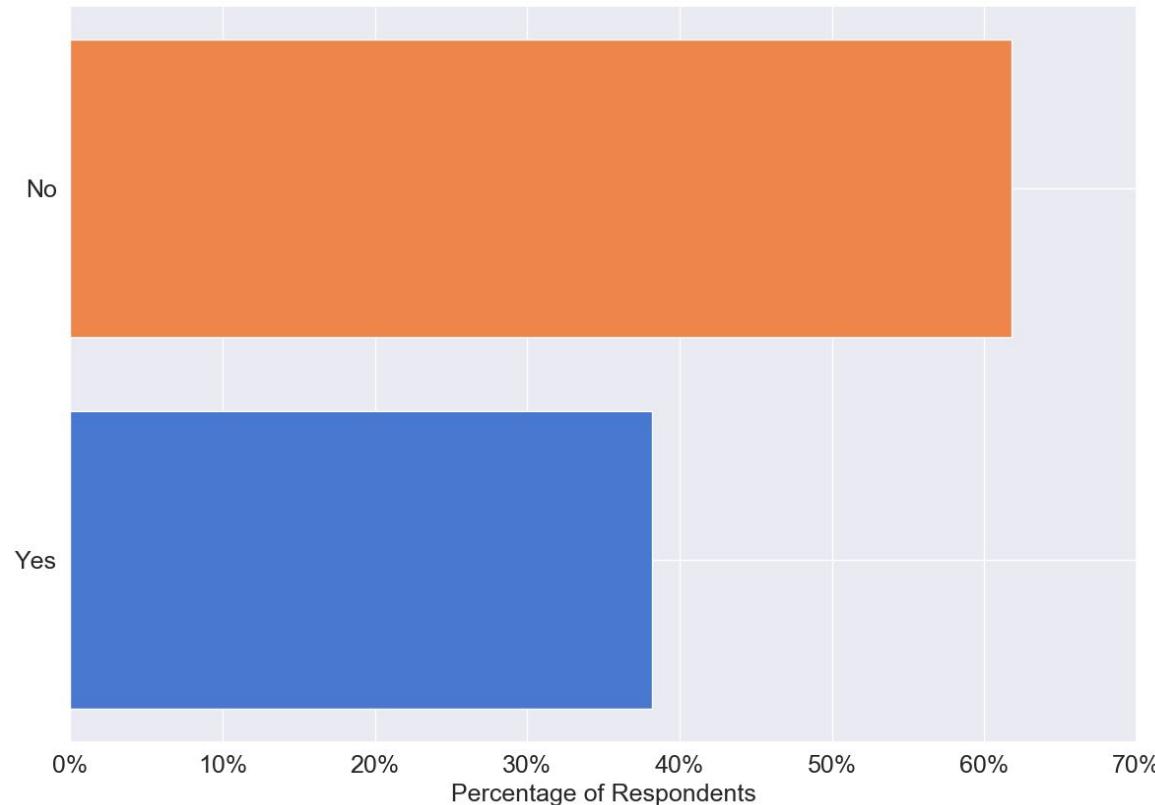
Demographics: Parents' education



For most respondents, at least one of their parents holds a Bachelor's degree or higher.

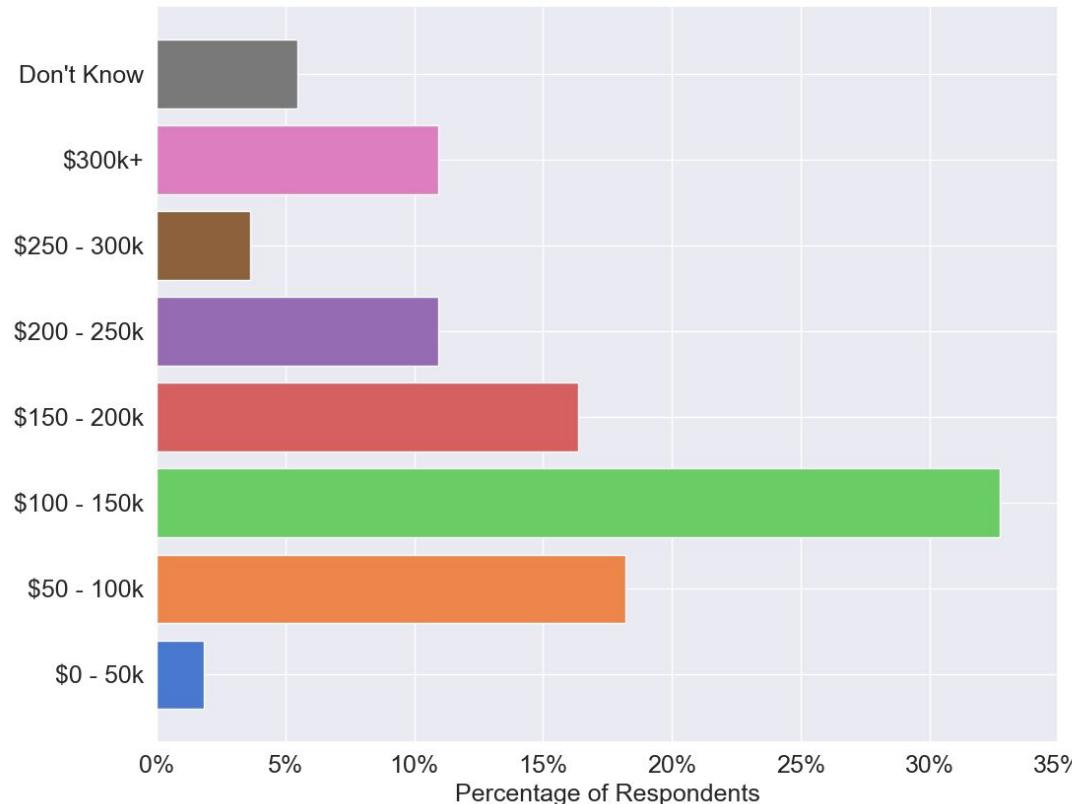
Demographics: North American parents?

Were either of your parents born in North America?



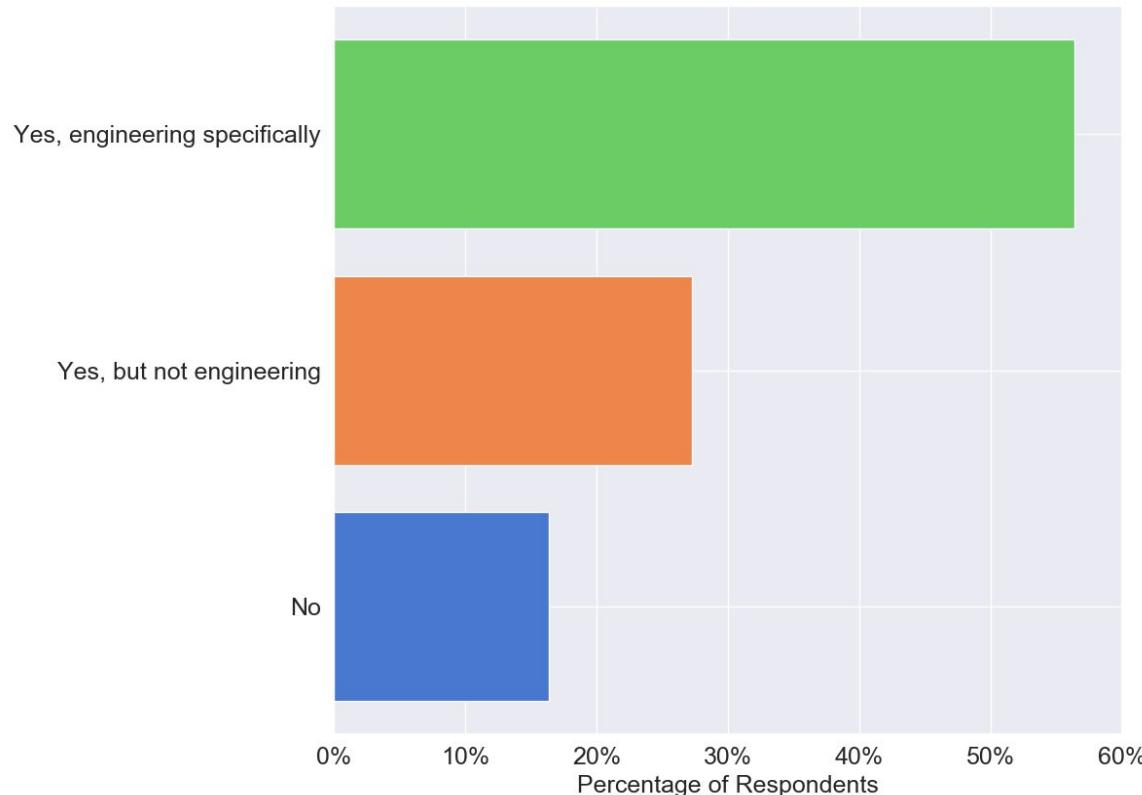
Demographics: Household income

What was your parents' combined income at the time you entered university?



Demographics: STEM Parents

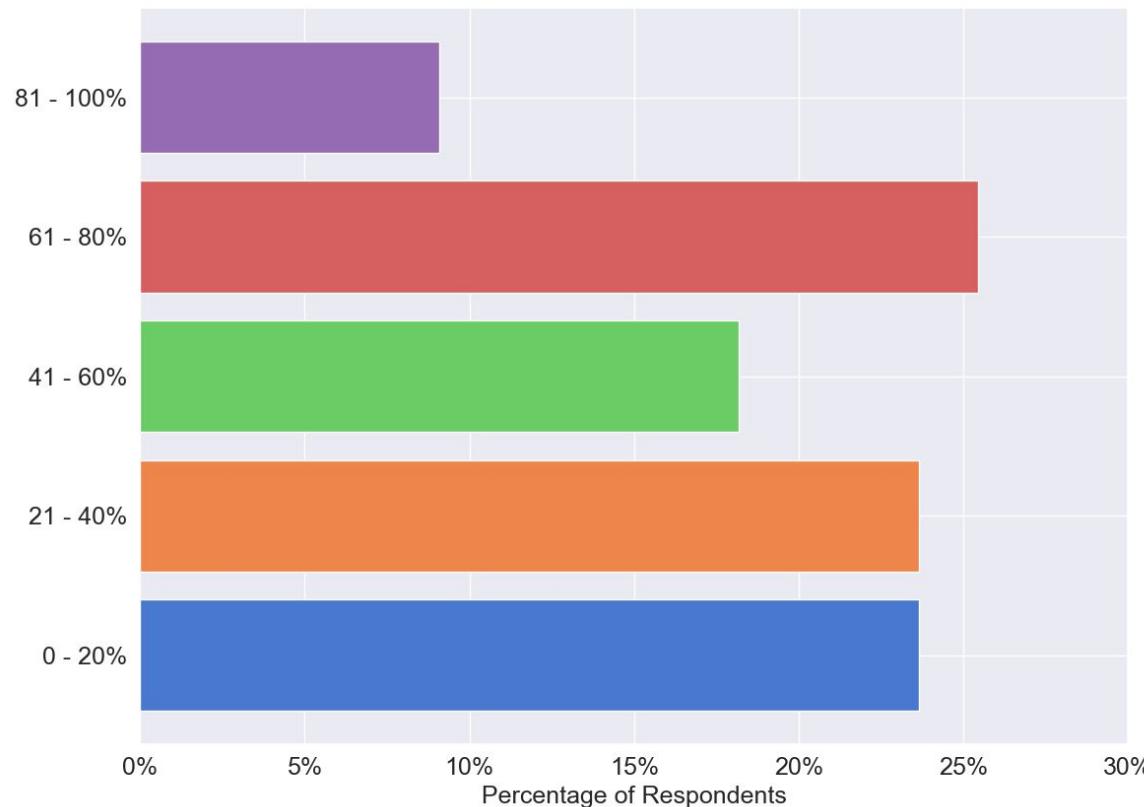
Have your parents worked in a STEM-related field?



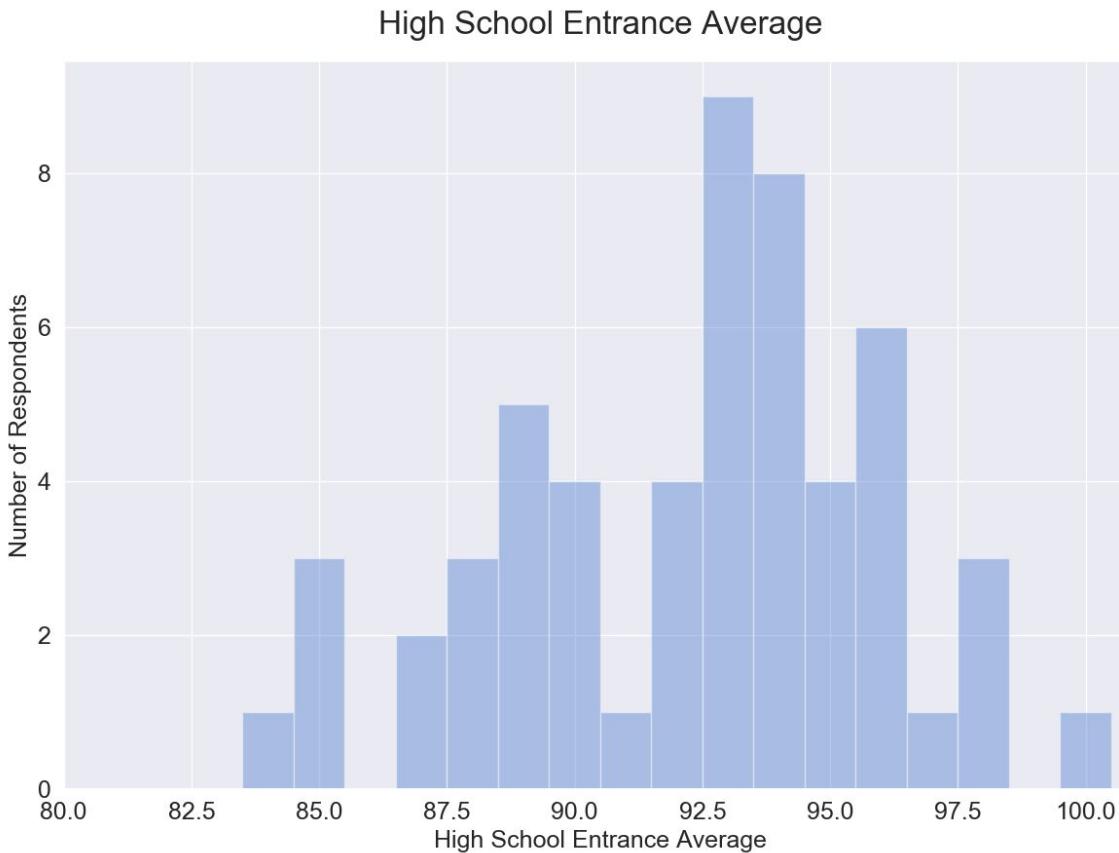
The apple doesn't fall far from the tree.

Demographics: How much of your university expenses were family-funded?

How much of your university expenses were funded by your family?

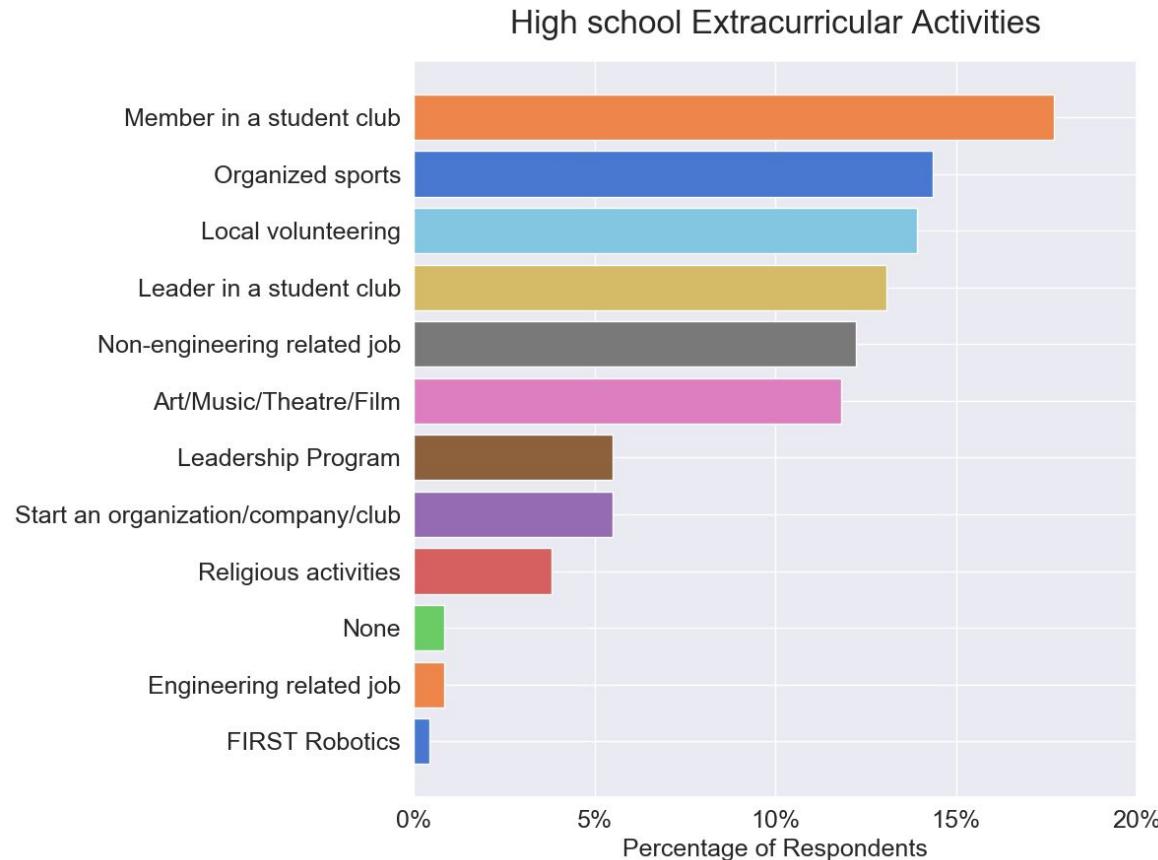


Demographics: High school entrance average



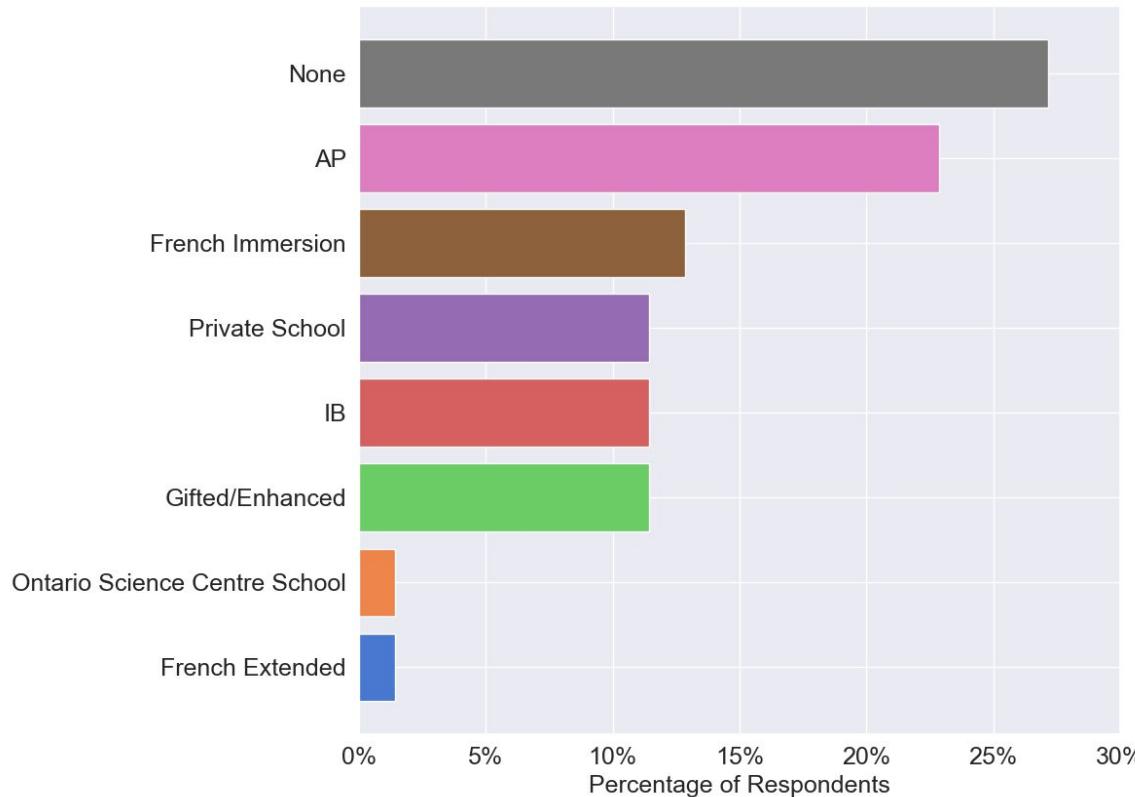
This distribution seems pretty in-line with the current admission averages published by the university at the time of writing.

Demographics: High school extracurricular activities



Demographics: High school accelerated programs

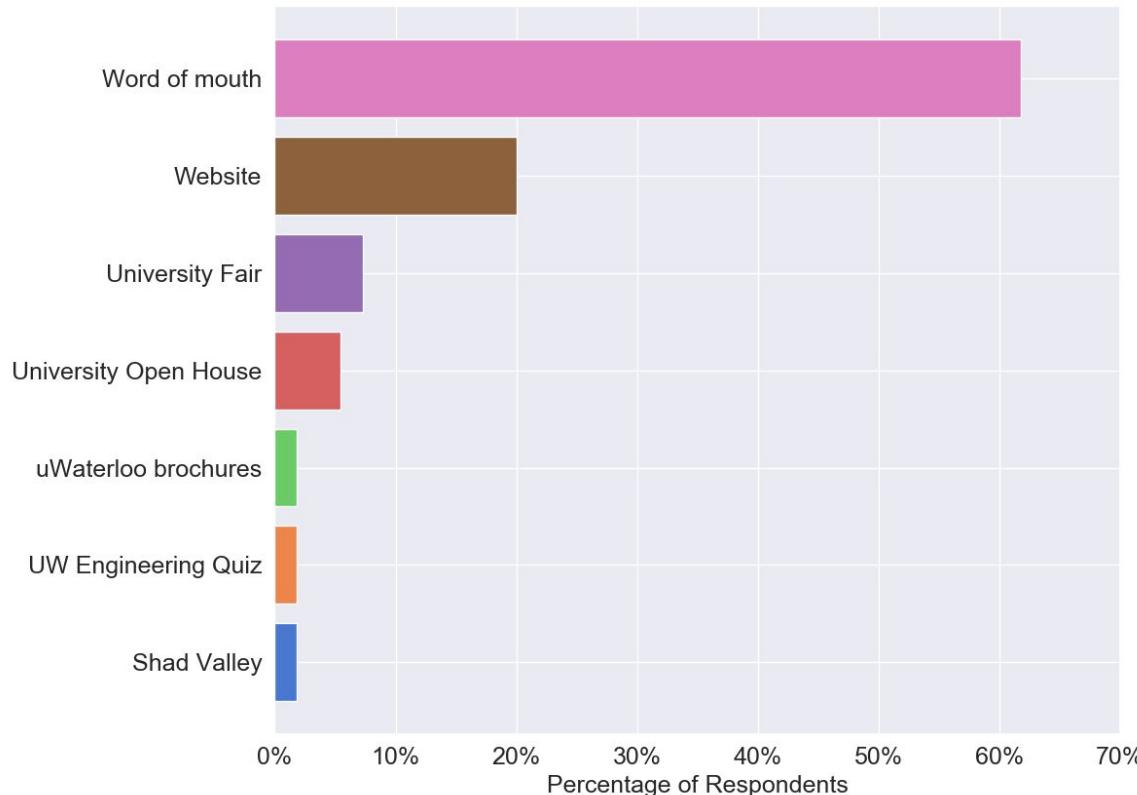
Which accelerated programs did you graduate from?



More than half of the respondents entered SYDE from some type of accelerated program.

Demographics: How did you discover SYDE?

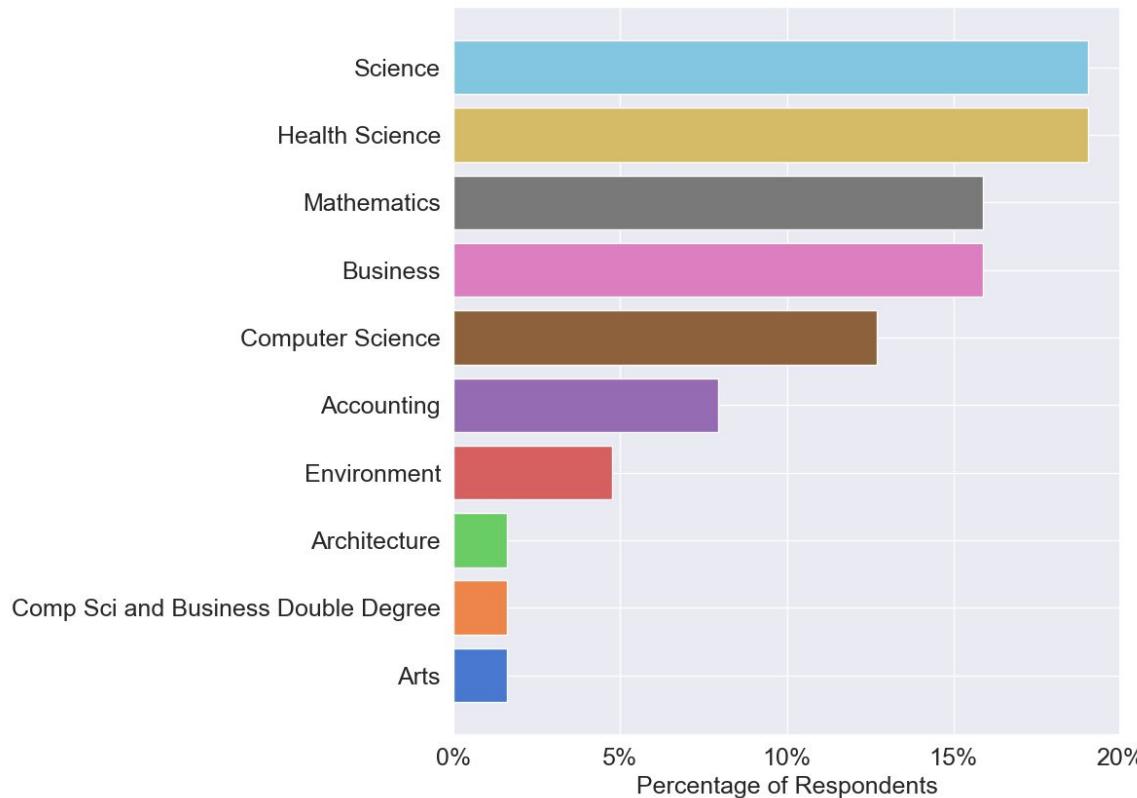
How did you find out about SYDE?



Anecdotally, word of mouth has always been said to be the most common way that people find out about SYDE.

Demographics: Non-engineering faculties applied to

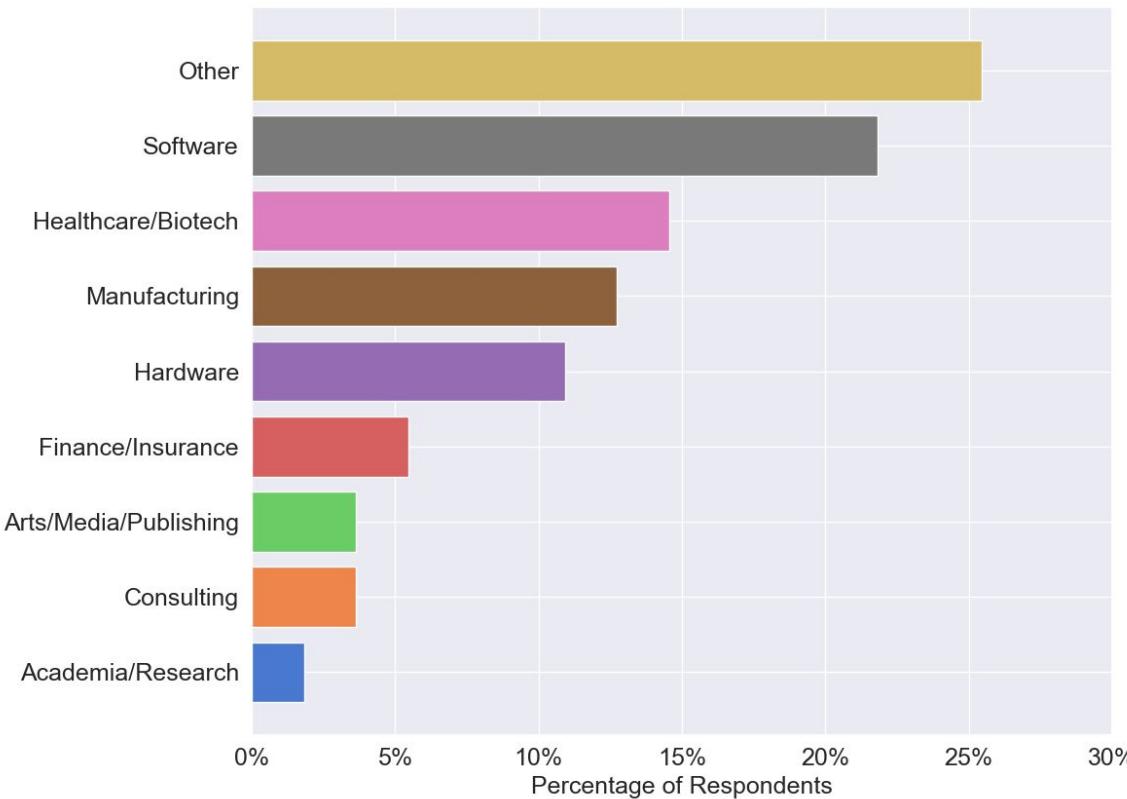
What other university faculties did you apply to?



Surprisingly, although most of our class ended up in software or software-adjacent co-op positions by 4th year, computer science was not as popular as science or health science.

Demographics: Desired industry before university

Before university, what industry did you want to work in?

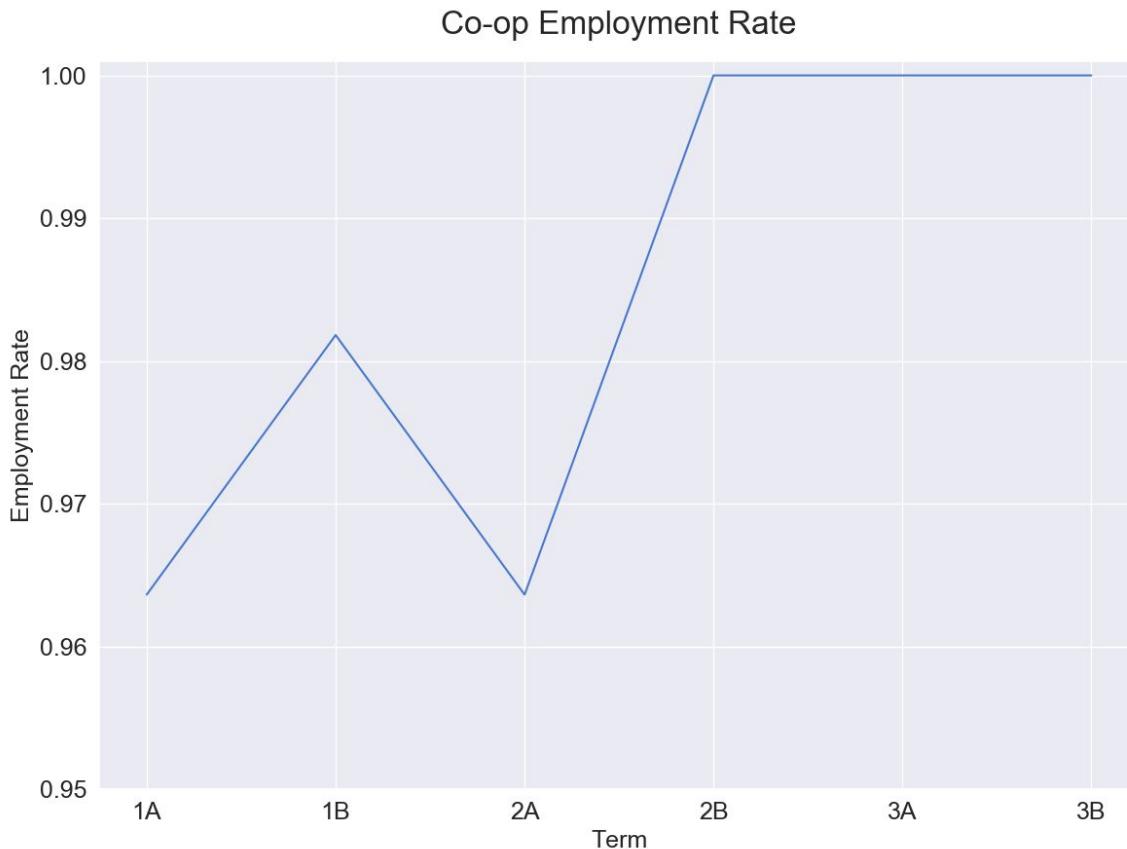


Before starting university, our interests were all over the place.

Co-op

Salaries, Locations, Industries, Brain Drain

Co-op: Employment Rate



Almost 100.

Co-op: Job search method

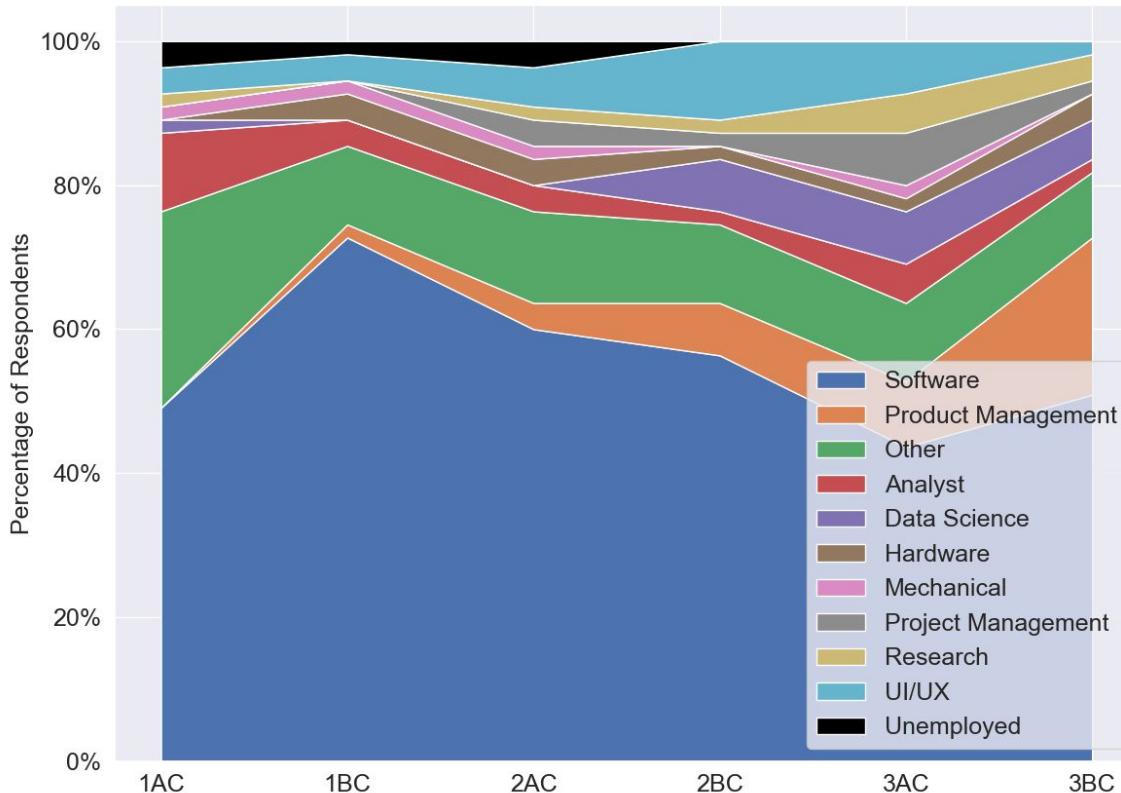
How did you find your job?



As terms progressed, we became less dependent on Jobmine / Waterloo Works for getting a job.

Co-op: Job titles by term

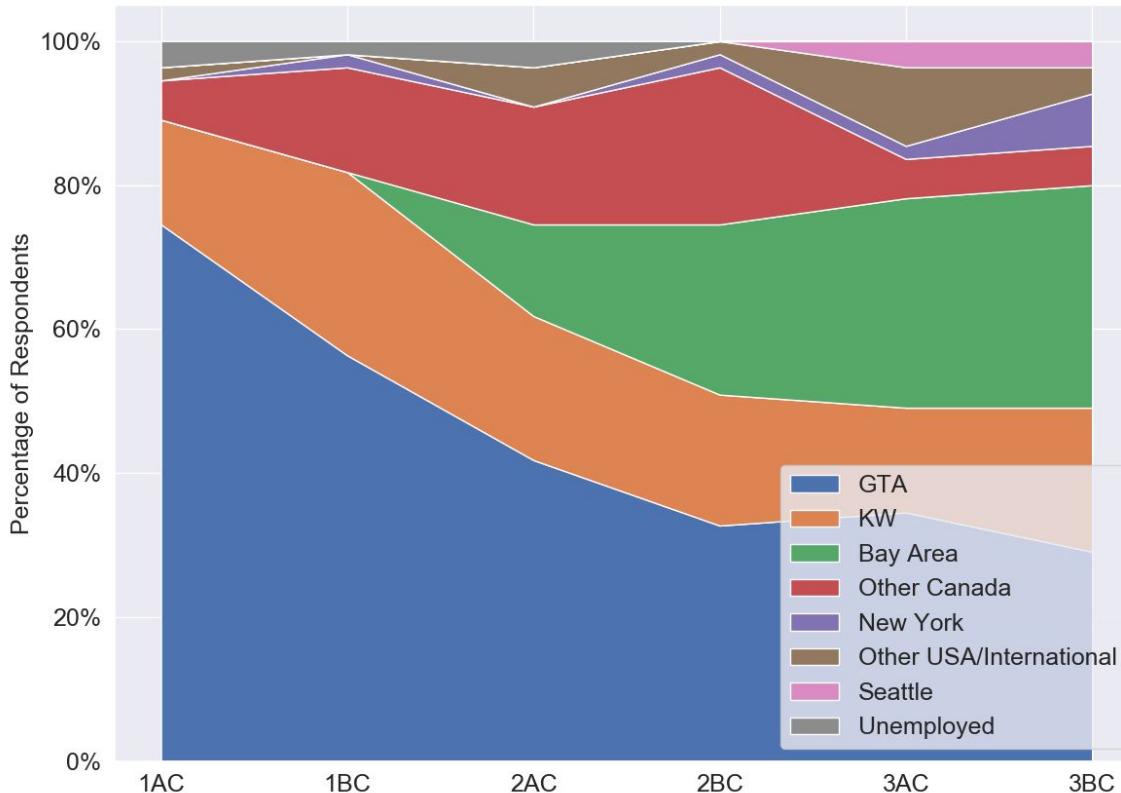
What did you do on co-op?



Product Management was the only co-op job that consistently grew in popularity over time.

Co-op: Job location by term

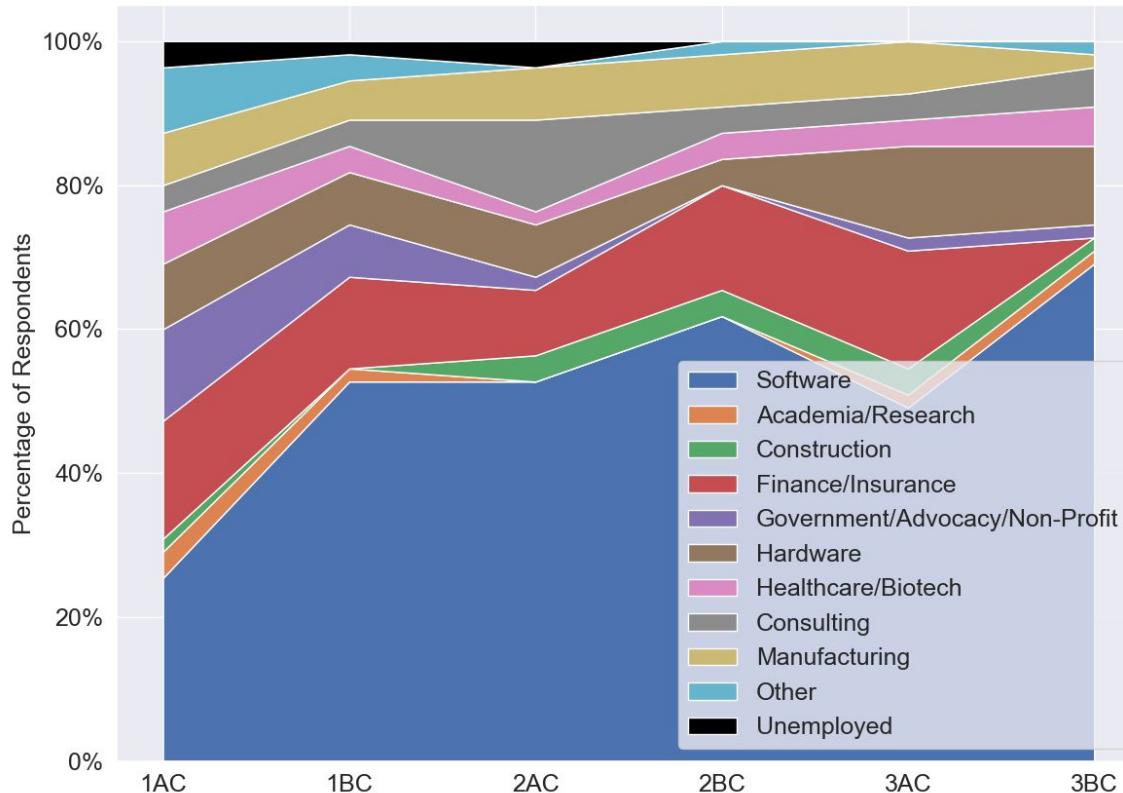
In which city did you work?



As the terms went by, more of us found ourselves outside of Canada for co-op.

Co-op: Industry by term

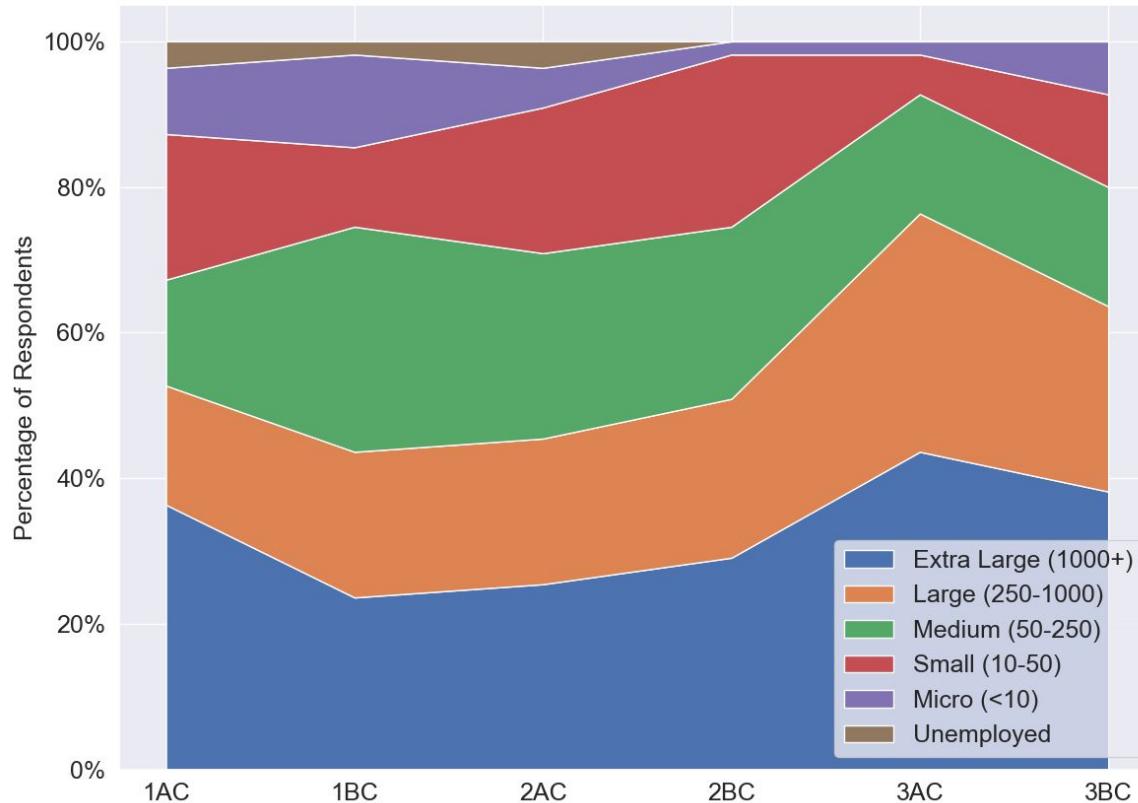
Which industry best describes the company you worked for?



The software industry became increasingly popular.

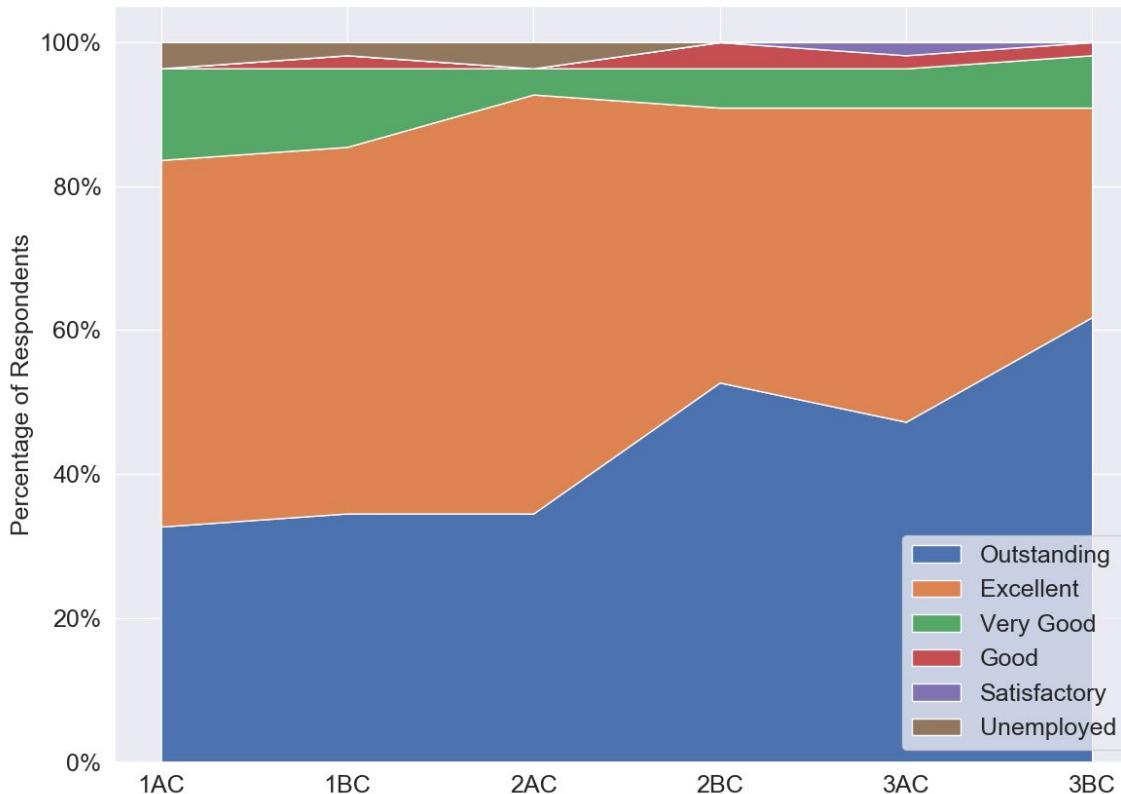
Co-op: Company size by term

What size was the company when you worked there?



Co-op: Performance rating by term

What was your Jobmine performance rating?



Outstanding

"This rating is reserved for only those few students who have distinguished themselves by their unique contribution or exceptional performance."^[1]

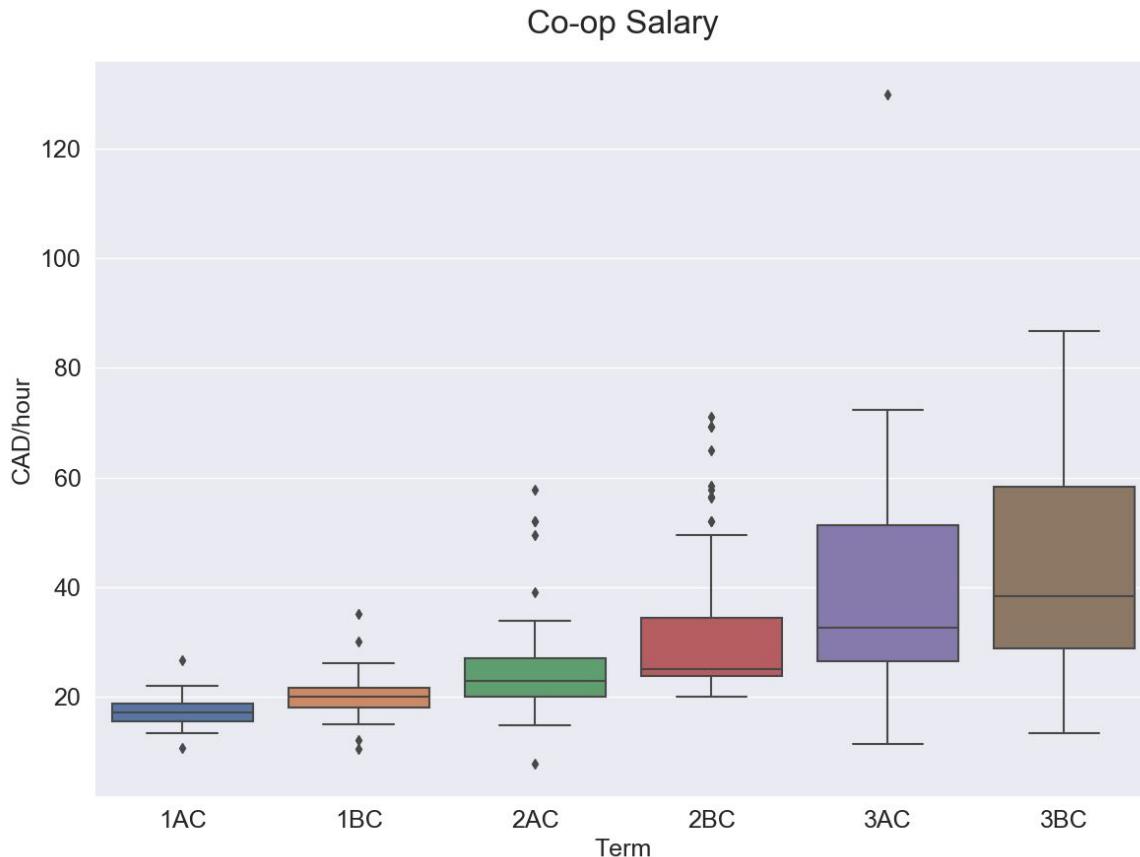
Perhaps the co-op performance rating scale needs some reassessment.

Or maybe we're just that great.

Show this to your employer, we won't mind.

[1] <https://uwaterloo.ca/co-operative-education/supports-and-resources/forms/student-performance-evaluation>

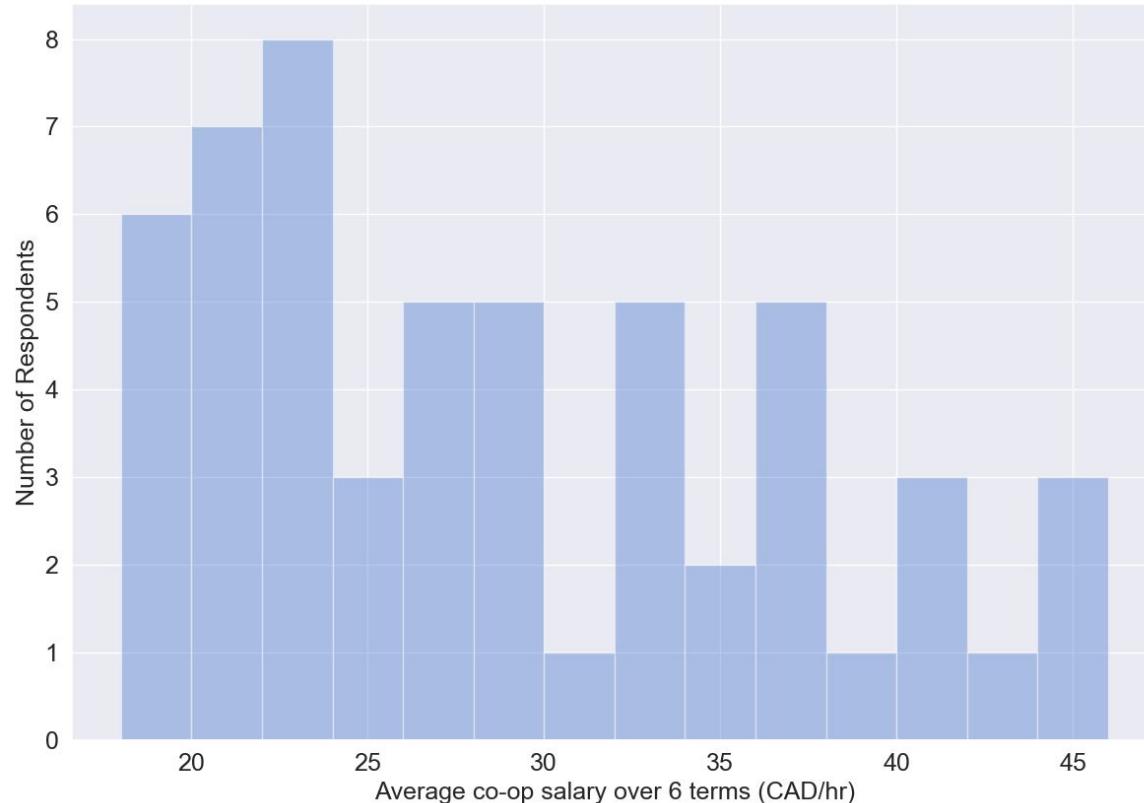
Co-op: Salary by term



While the median co-op salary increased over time, so too did the salary variability.

Co-op: Average co-op salary over 6 terms

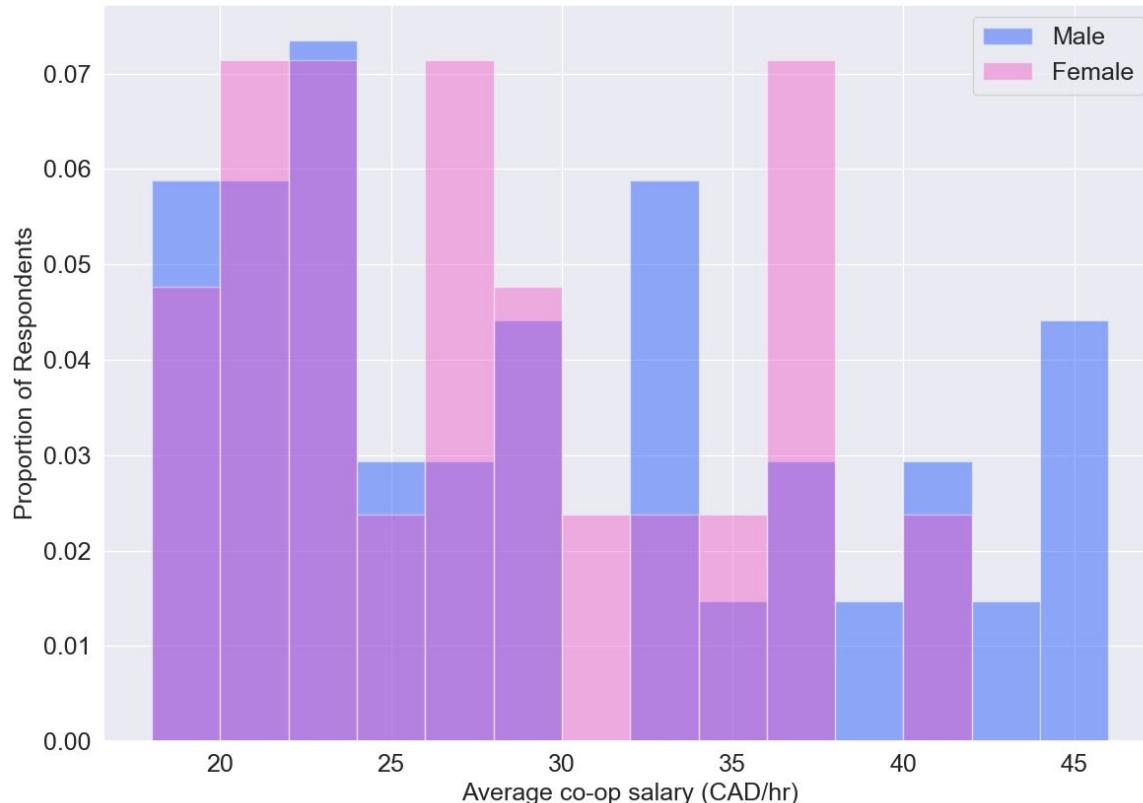
Average co-op salary over 6 terms



On average, each student made an average of 29.87 CAD/hr over their 6 co-op terms. Assuming a 37.5 hour work week and 16 week co-op terms, average total co-op income was 107,532 CAD.

Co-op: Mean co-op salary separated by gender

Average co-op salary separated by gender

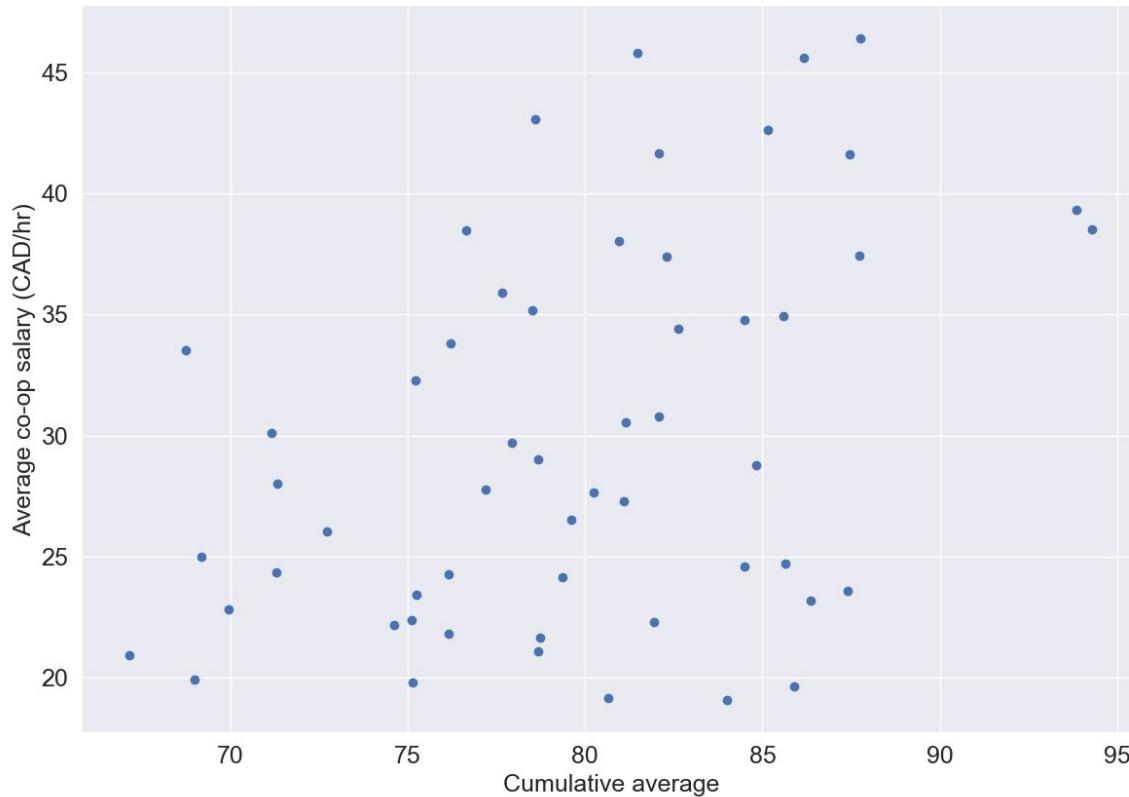


Over the 6 co-op terms, the average co-op salary was **30.48 CAD/hr for males** and **28.90 CAD/hr for females.**

Females made **1.58 CAD/hr less** than males on average.

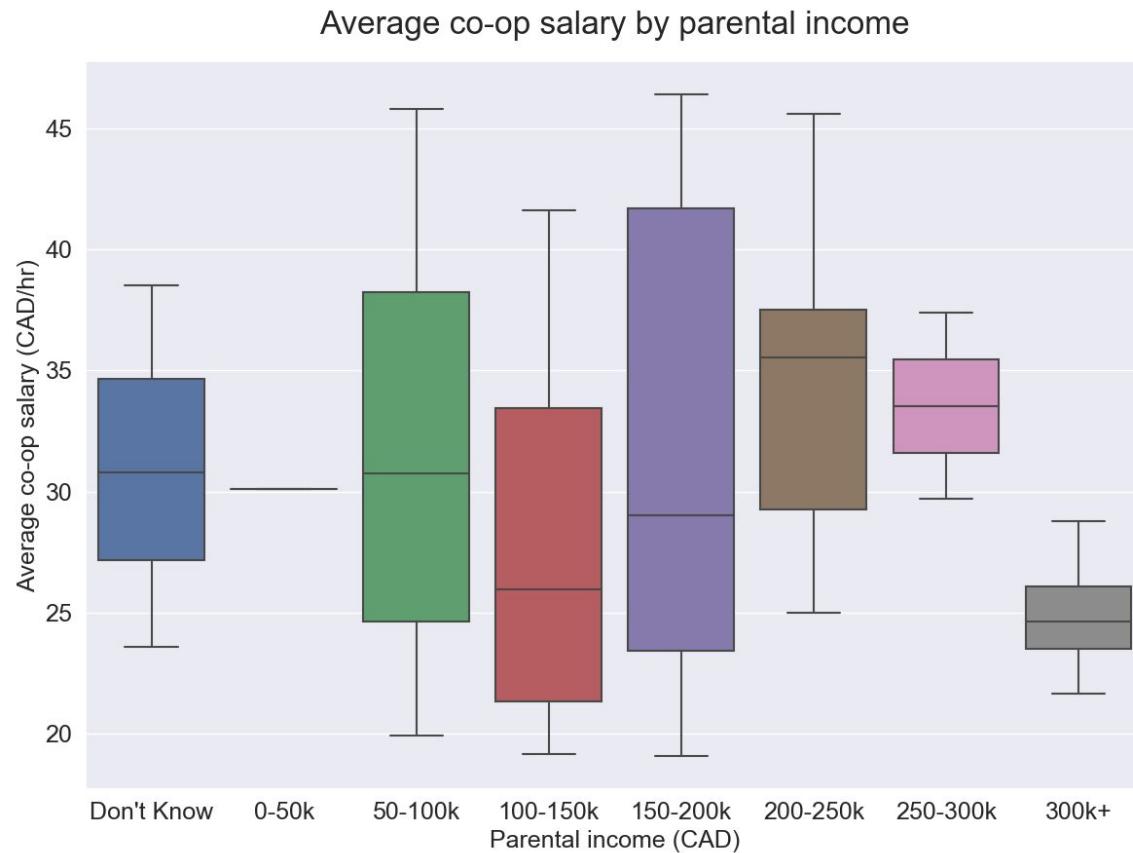
Co-op: Marks versus salary

Average co-op salary versus cumulative average



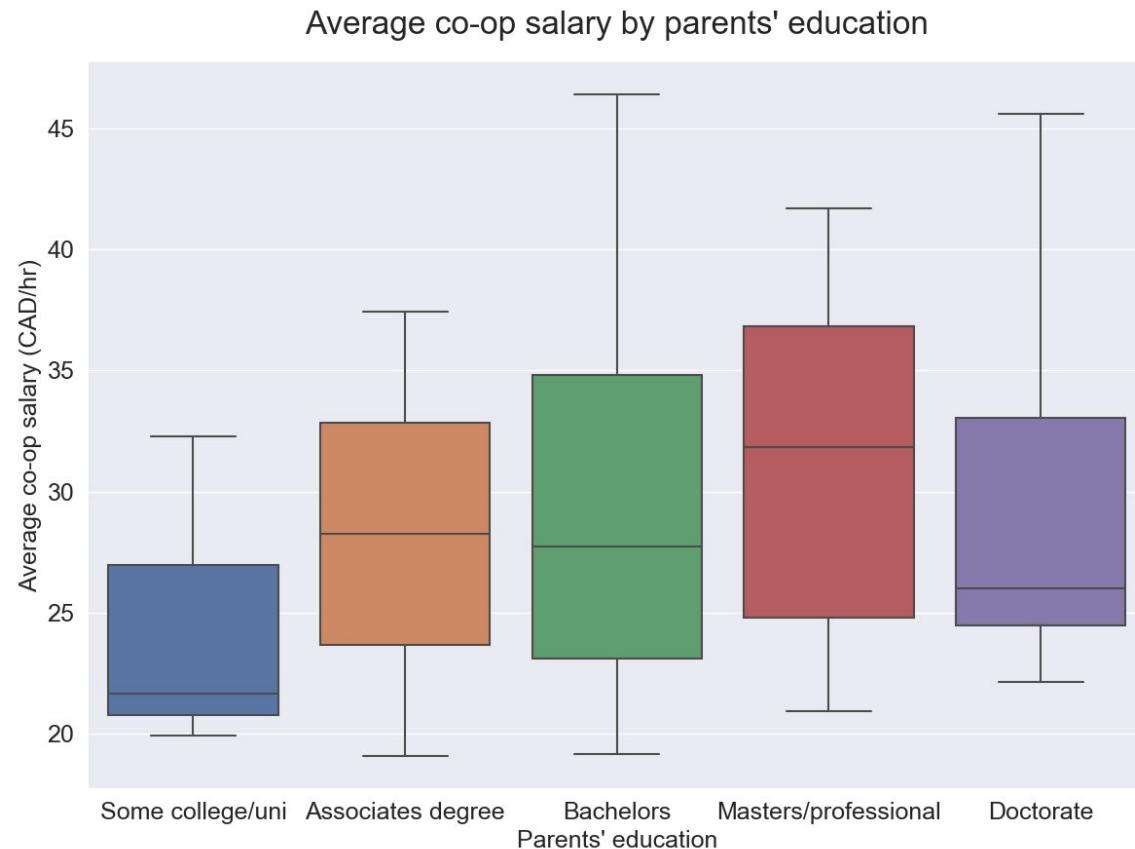
Though no strong relationship was identified, it does seem that a higher cumulative average invited a higher pay ceiling.

Co-op: Average co-op salary by parental income



There is not a strong correlation between average co-op salary and parental income. However, it is interesting that the average co-op salary was lower when parents made \$300k+.

Co-op: Average co-op salary by parental education



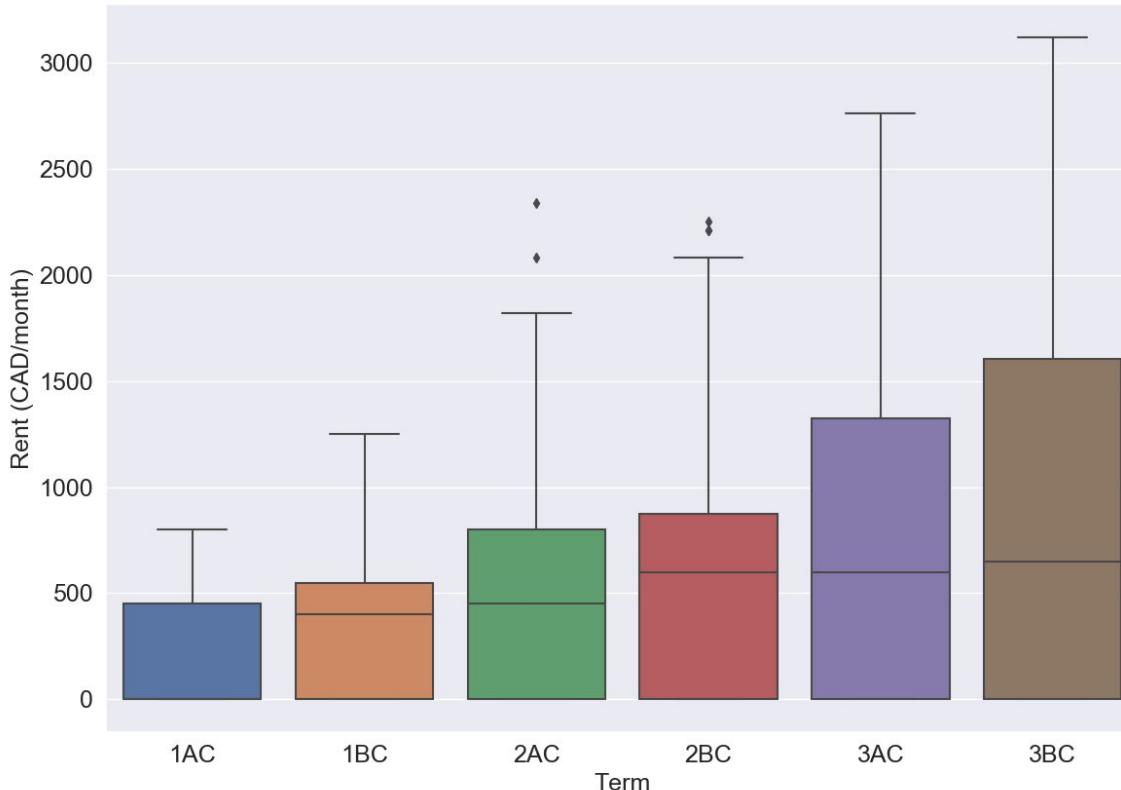
Students whose parents finished college or university had higher average co-op salaries.

Co-op: Ethnicity vs salary

| Which ethnic background(s) do you identify with? | Average Co-op Salary |
|---|----------------------|
| East Asian | 31.22 CAD/hr |
| Middle Eastern | 33.82 CAD/hr |
| South Asian | 30.44 CAD/hr |
| Southeast Asian | 29.69 CAD/hr |
| White | 27.64 CAD/hr |

Co-op: Rent by term

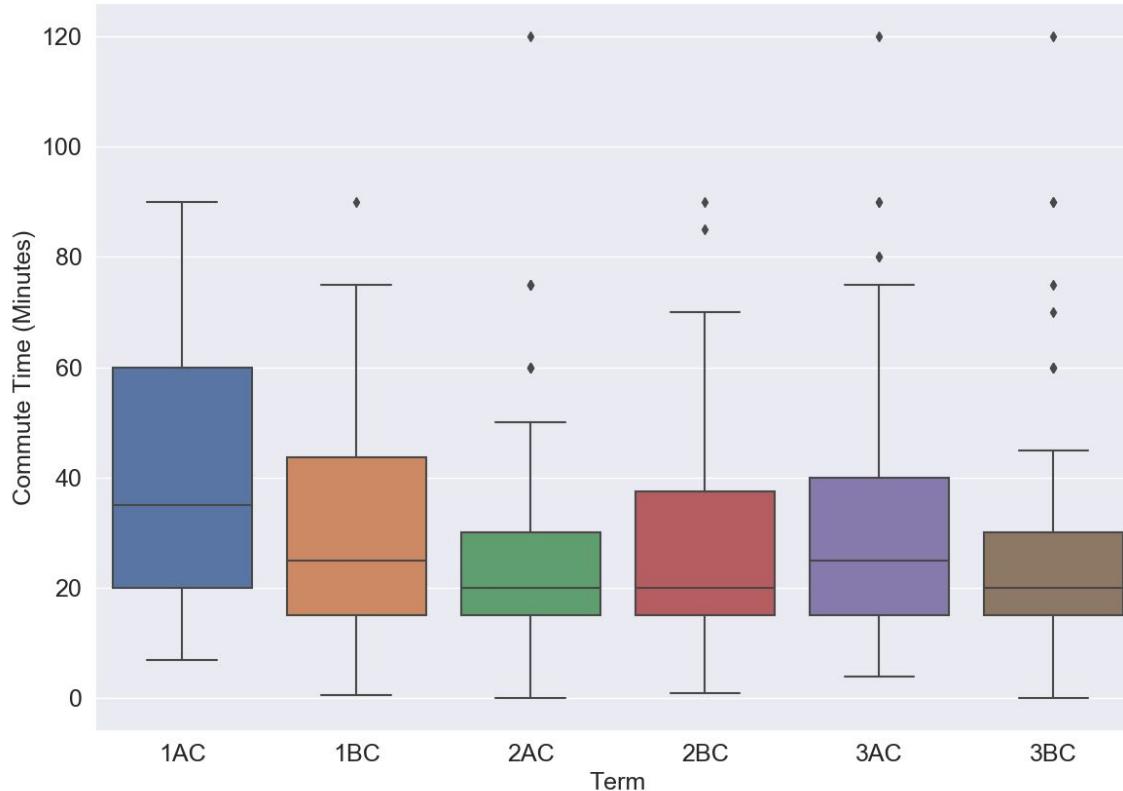
How much did you pay for rent each work term?



Over time, the GTA became a less popular location while the Bay Area became more popular. This meant that rent prices increased as less people could live with their parents and more people had to pay Bay Area rent.

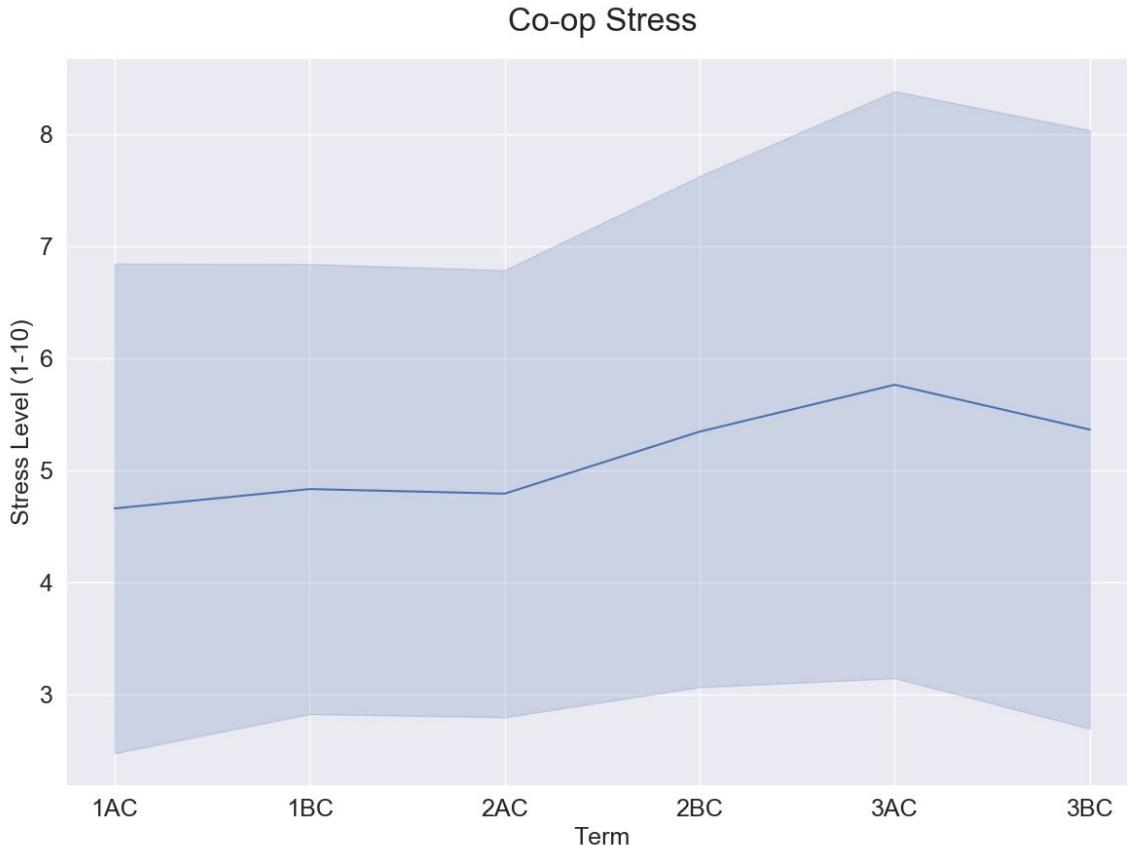
Co-op: Commute

How long was your commute to work?



Commute times were high during the first co-op term because many students lived with their parents. Afterwards the median commute time was less than 30 minutes.

Co-op: Stress by term



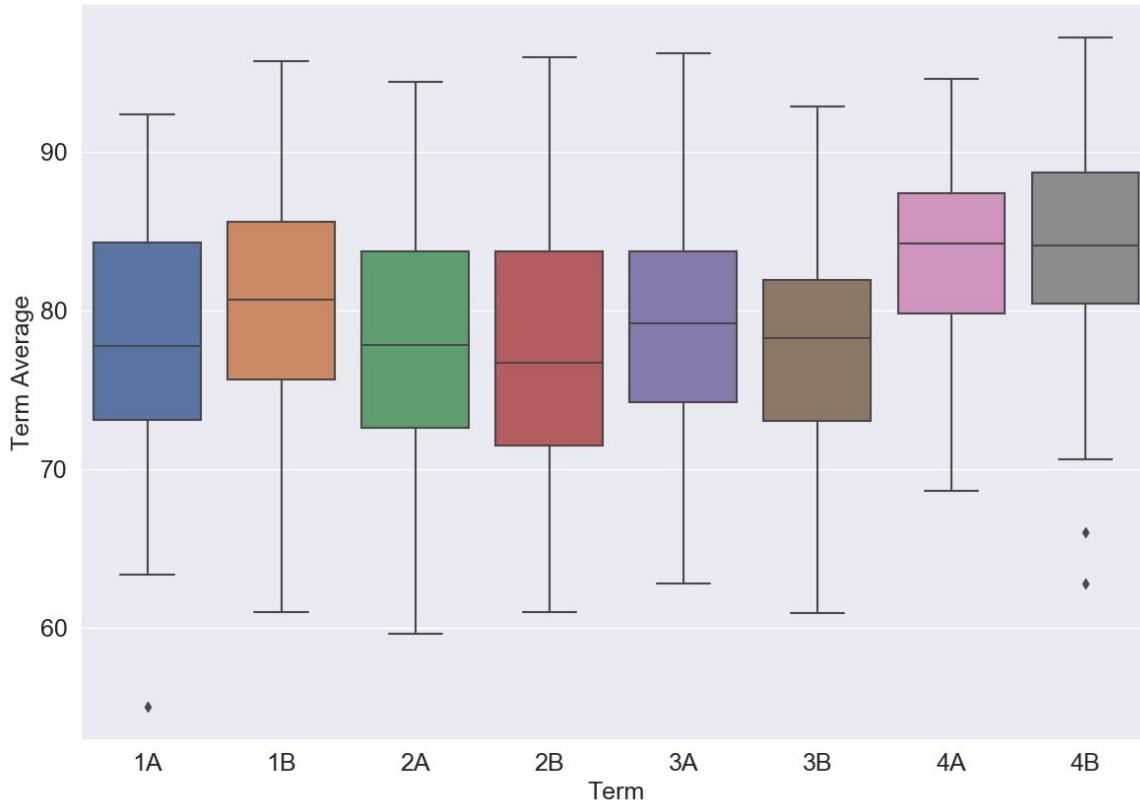
Mean co-op stress remained relatively constant throughout the terms.

School

Grades, Courses, Attendance, Exams

School: Marks by term

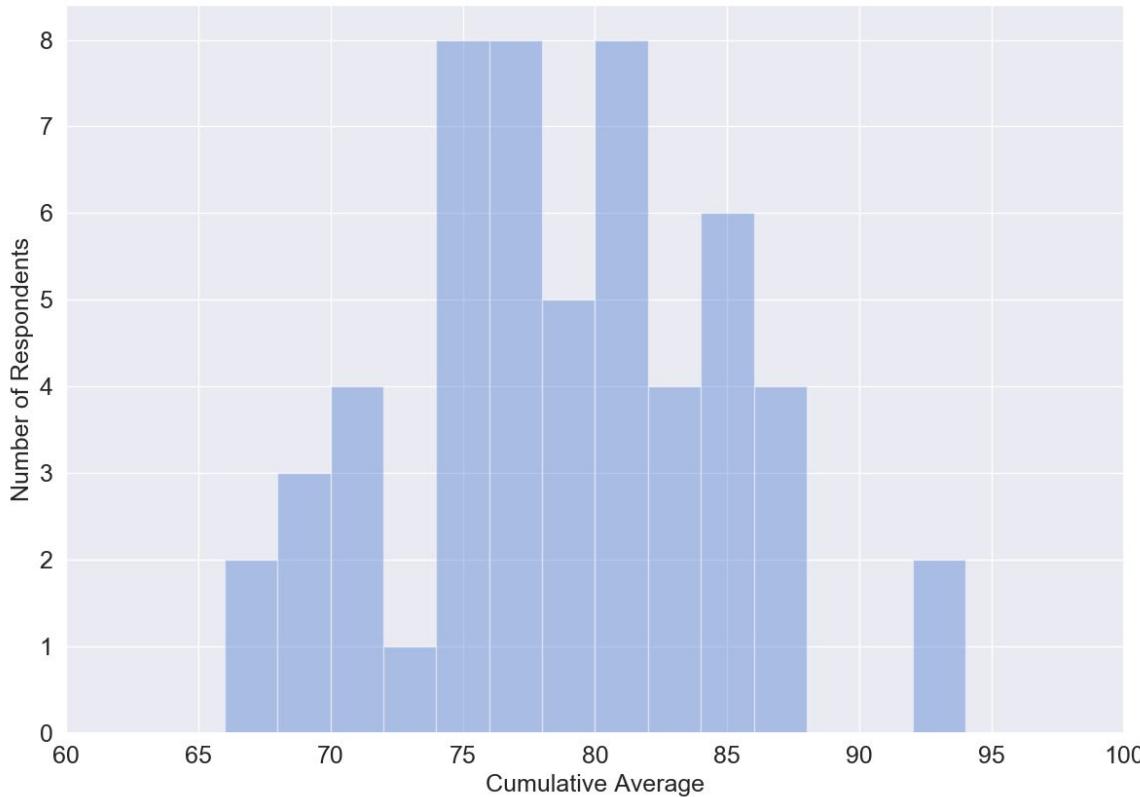
Term Average



1B, 4A, and 4B median averages were higher than other terms.

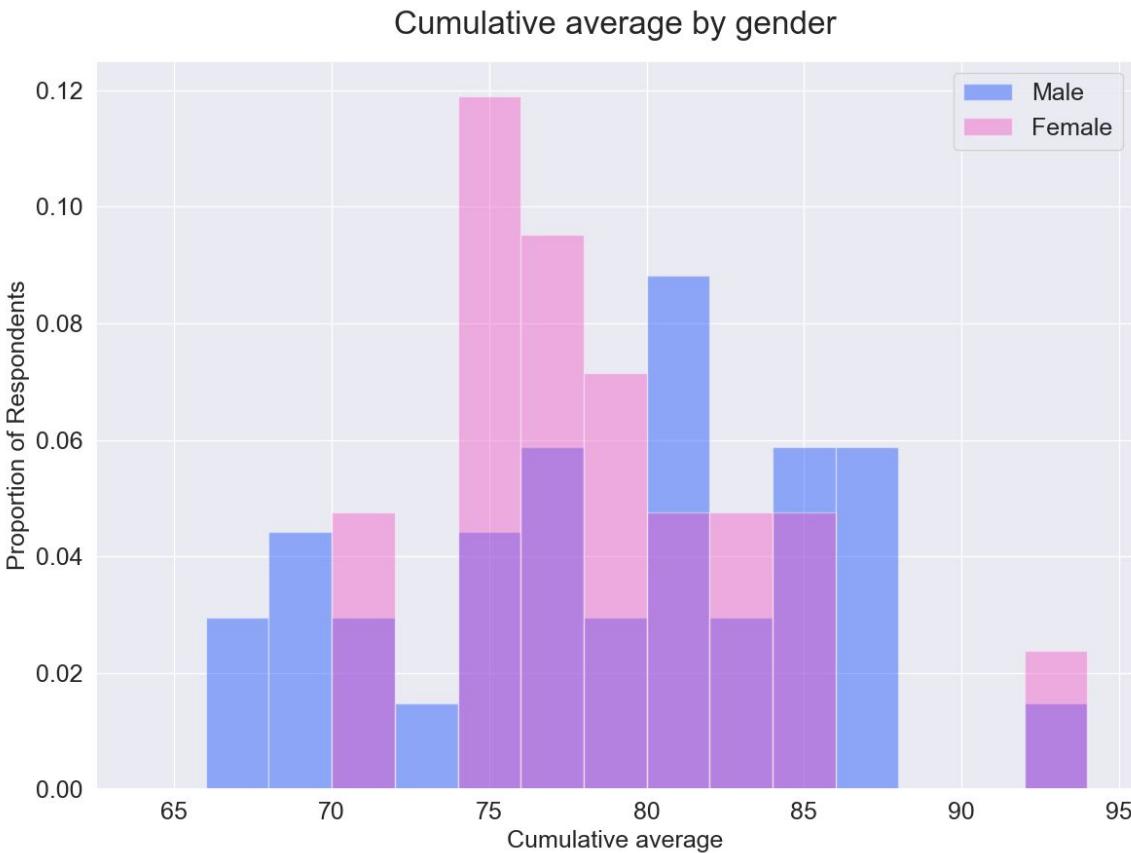
School: Cumulative Average

Cumulative Average



Our class' cumulative average was centered right around 80.

School: Cumulative average by gender



The average cumulative average was **79.72%** for males and **79.67%** for females.

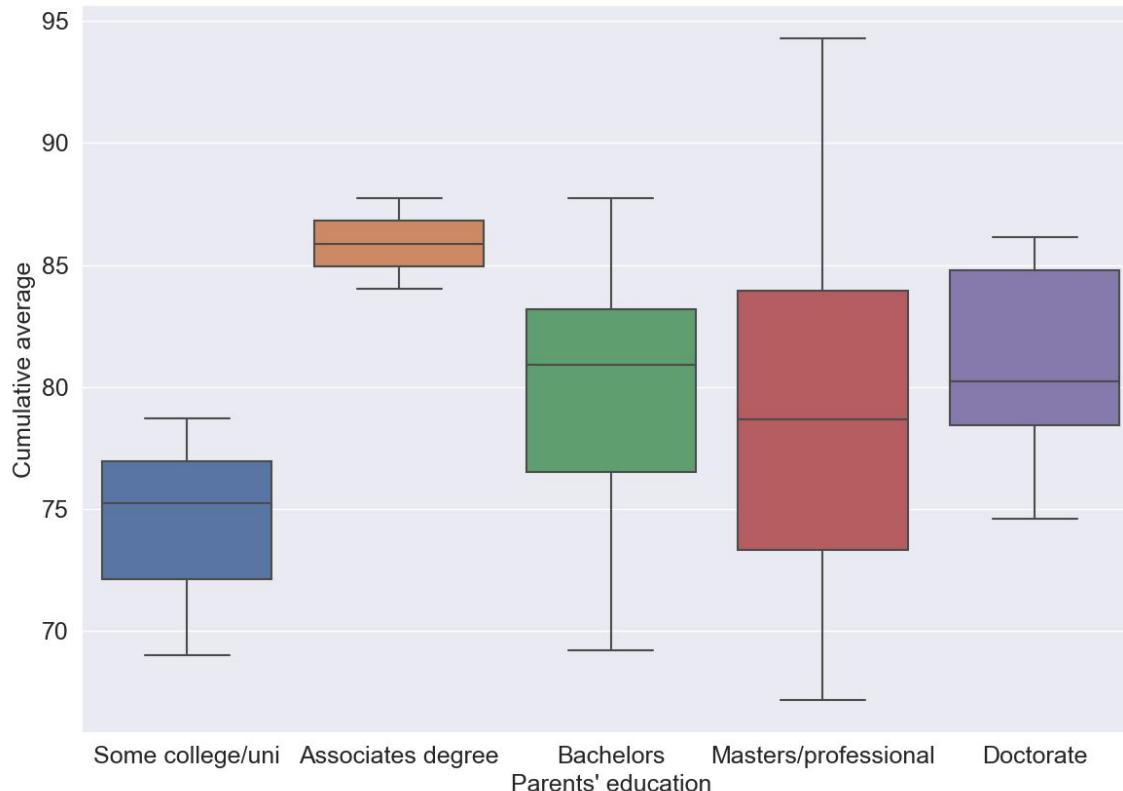
There did not seem to be a relationship between gender and marks.

School: Ethnicity vs marks

| Which ethnic background(s) do you identify with? | Average Cumulative Average |
|---|-------------------------------|
| East Asian | 80.41% |
| Middle Eastern | 81.54% |
| South Asian | 78.07% |
| Southeast Asian | 77.93% |
| White | 80.17% |

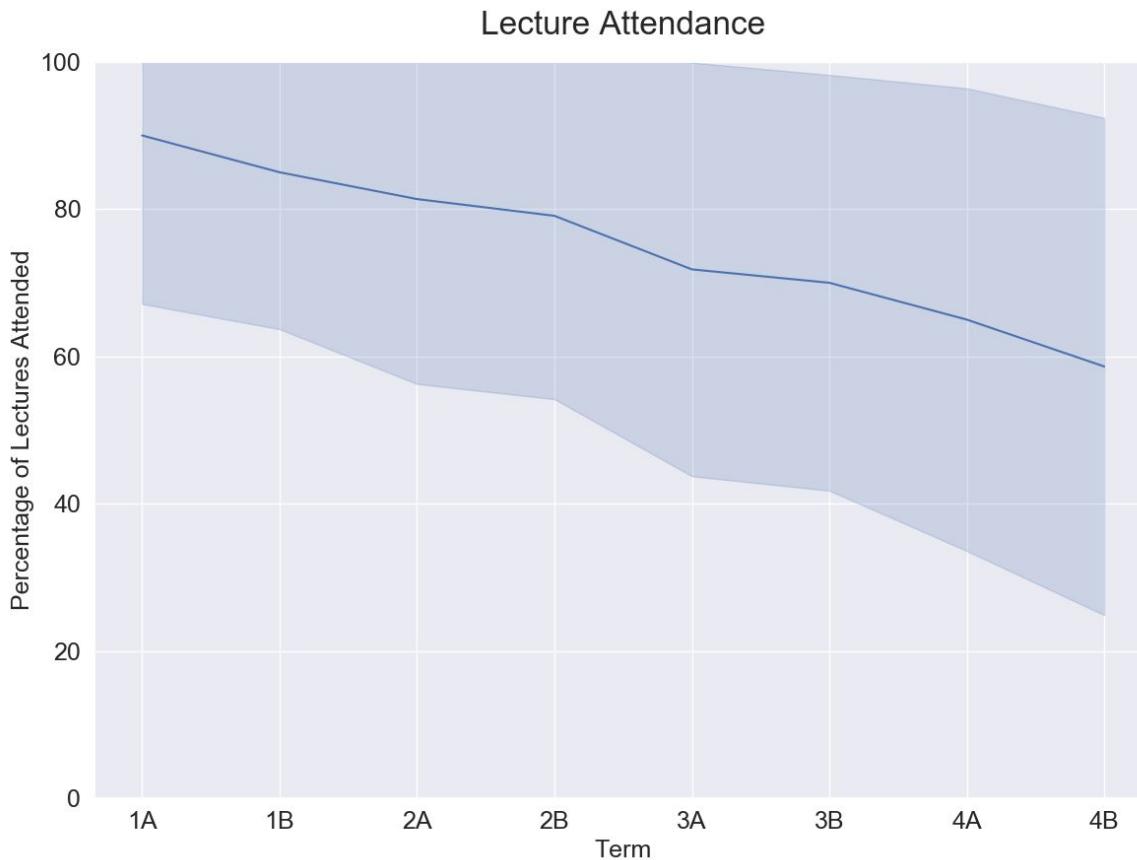
School: Parents' education versus marks

Cumulative average by parents' education



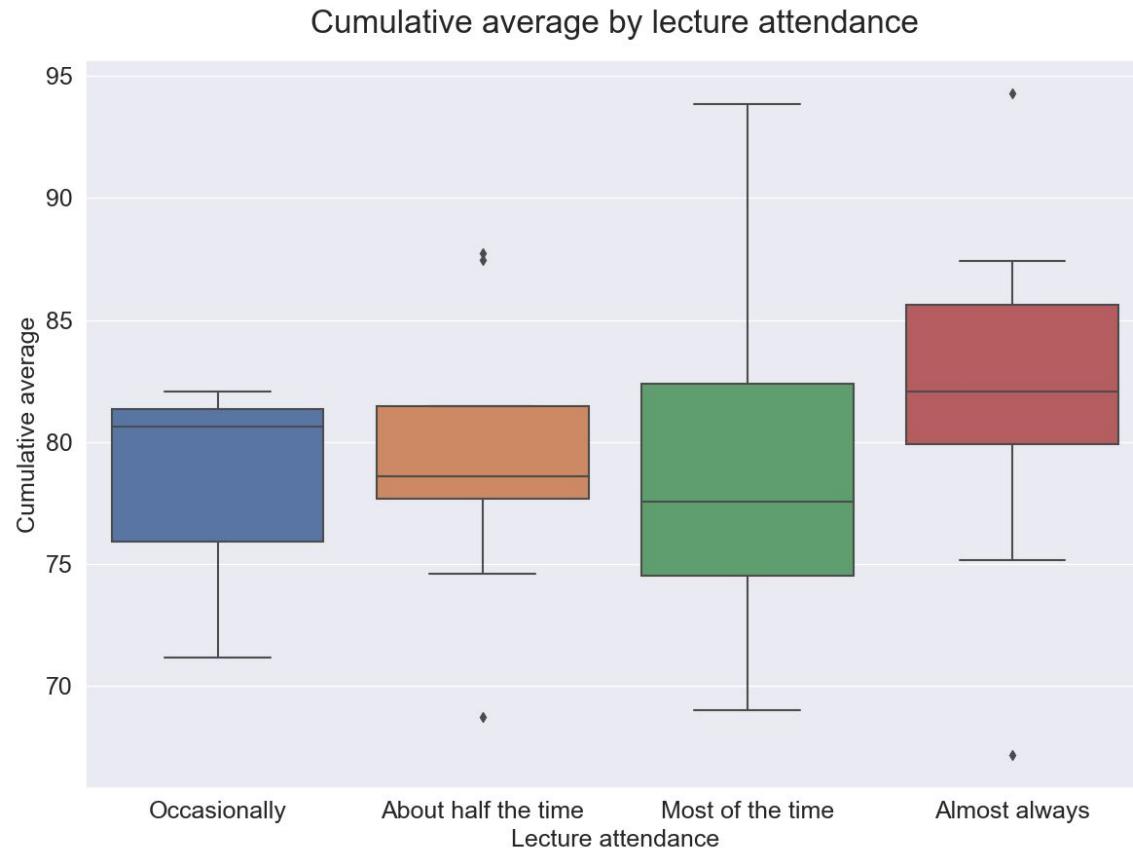
Students whose parents finished college or university had higher cumulative averages.

School: Lecture attendance



Senioritis in full swing.

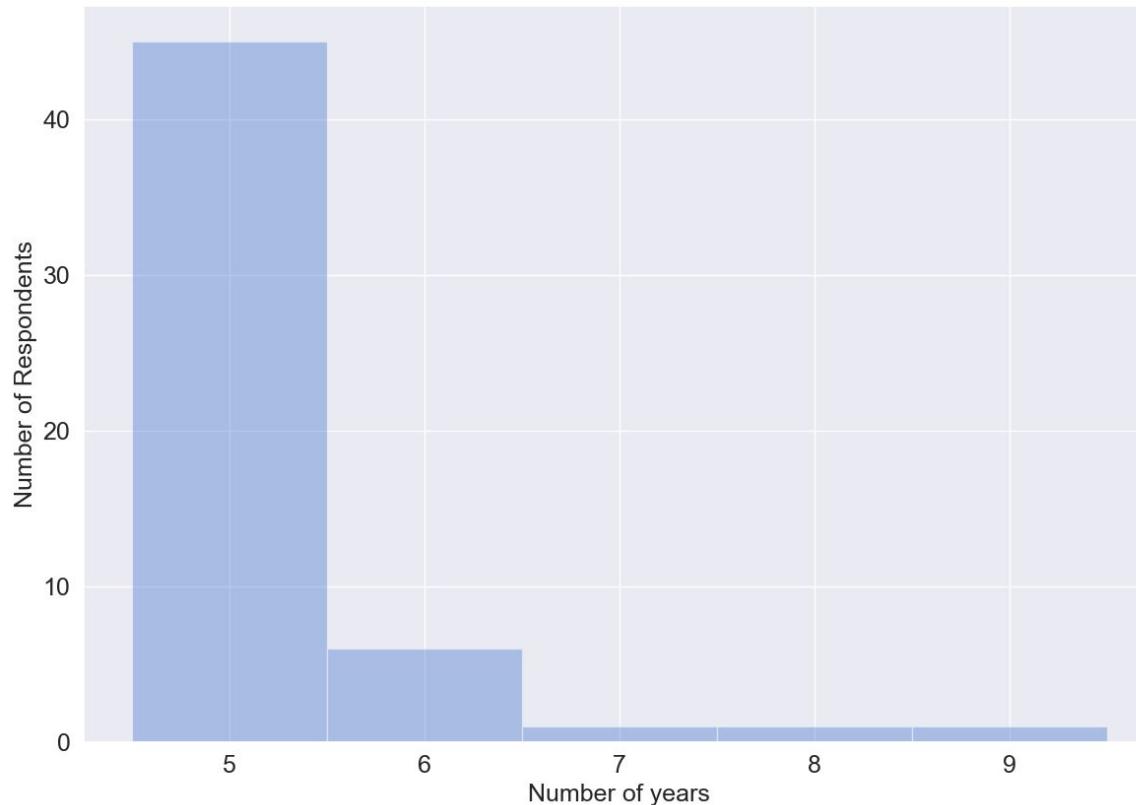
School: Cumulative average by lecture attendance



Students with the highest grades typically went to more class. However, students who occasionally went to class had the second highest median cumulative average. This could be explained by differences in learning styles.

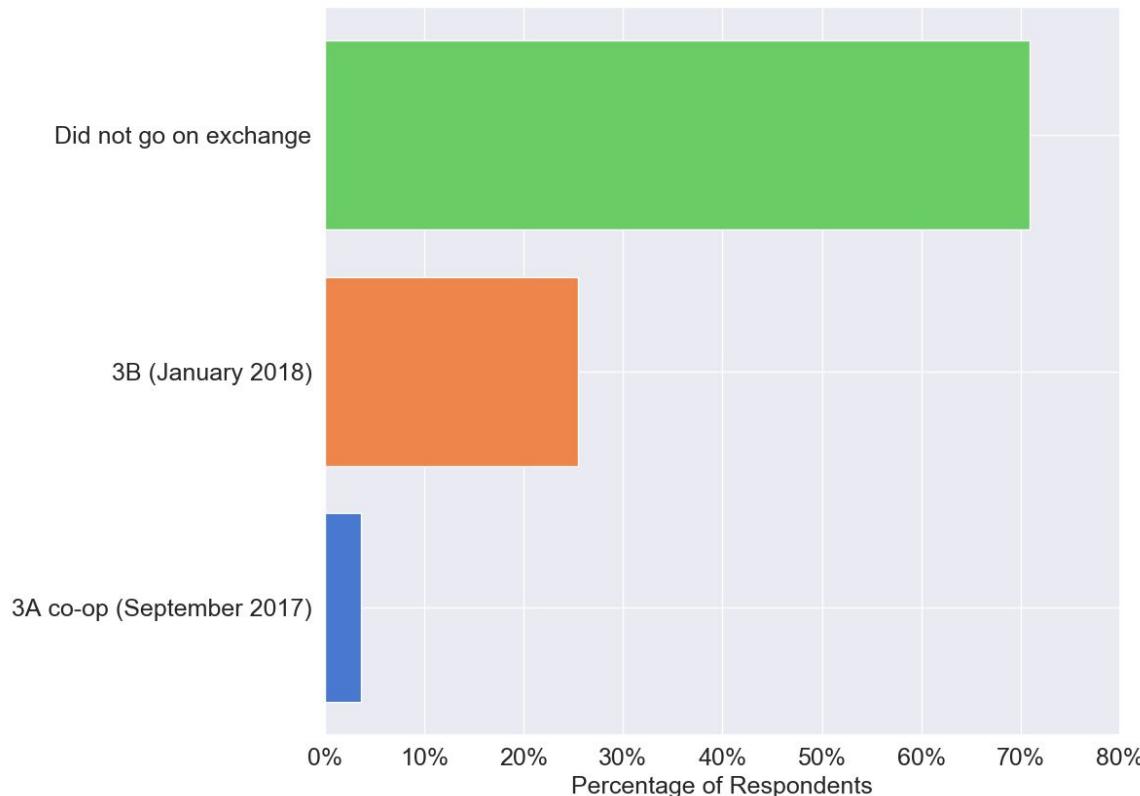
School: Years to complete degree

How many years did it take to finish your degree?



School: When did you go on exchange?

When (if at all) did you go on exchange?

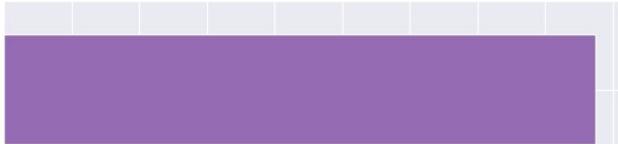


In SYDE, 3B is traditionally the most frictionless and flexible term to go on exchange as it does not disrupt our co-op sequence.

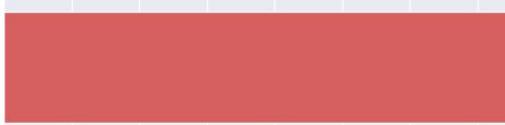
School: Exchange university

What exchange university did you attend?

National University of Singapore, Singapore



Nanyang Technological University, Singapore



Tottori University, Japan



University of Sheffield, UK



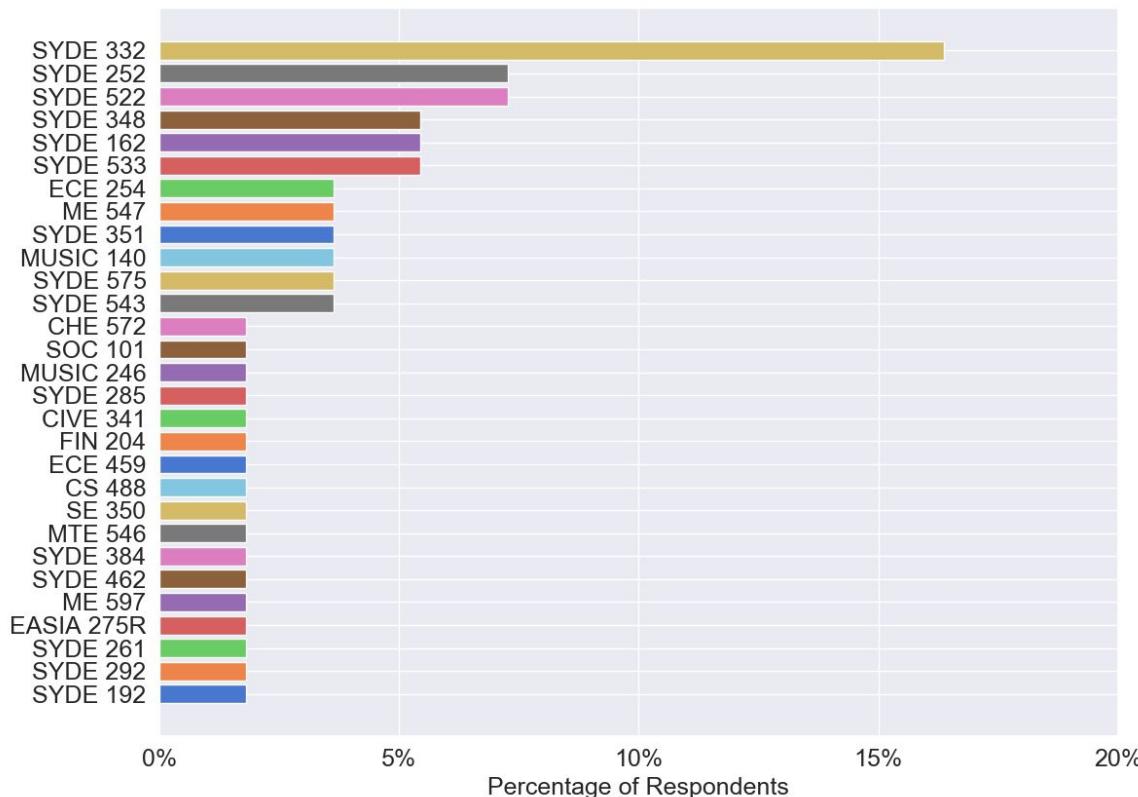
Lund University, Sweden



Singapore was by far the most popular exchange destination.

School: Most interesting course

What the most interesting course you took?



We had diverse interests.

SYDE 332

Introduction to Complex Systems

SYDE 252

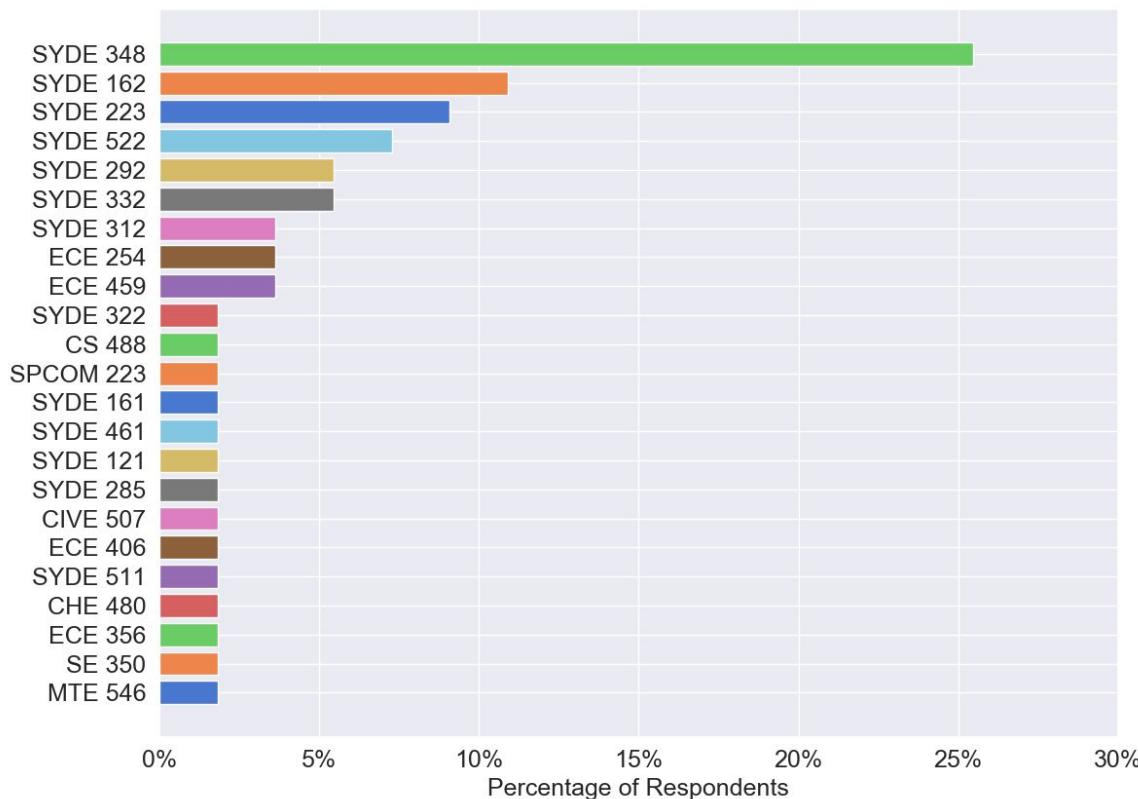
Linear Systems and Signals

SYDE 522

Machine Intelligence

School: Most useful course

What the most useful course you took?



We made good use of our design-focused courses.

SYDE 348

User Centred Design Methods

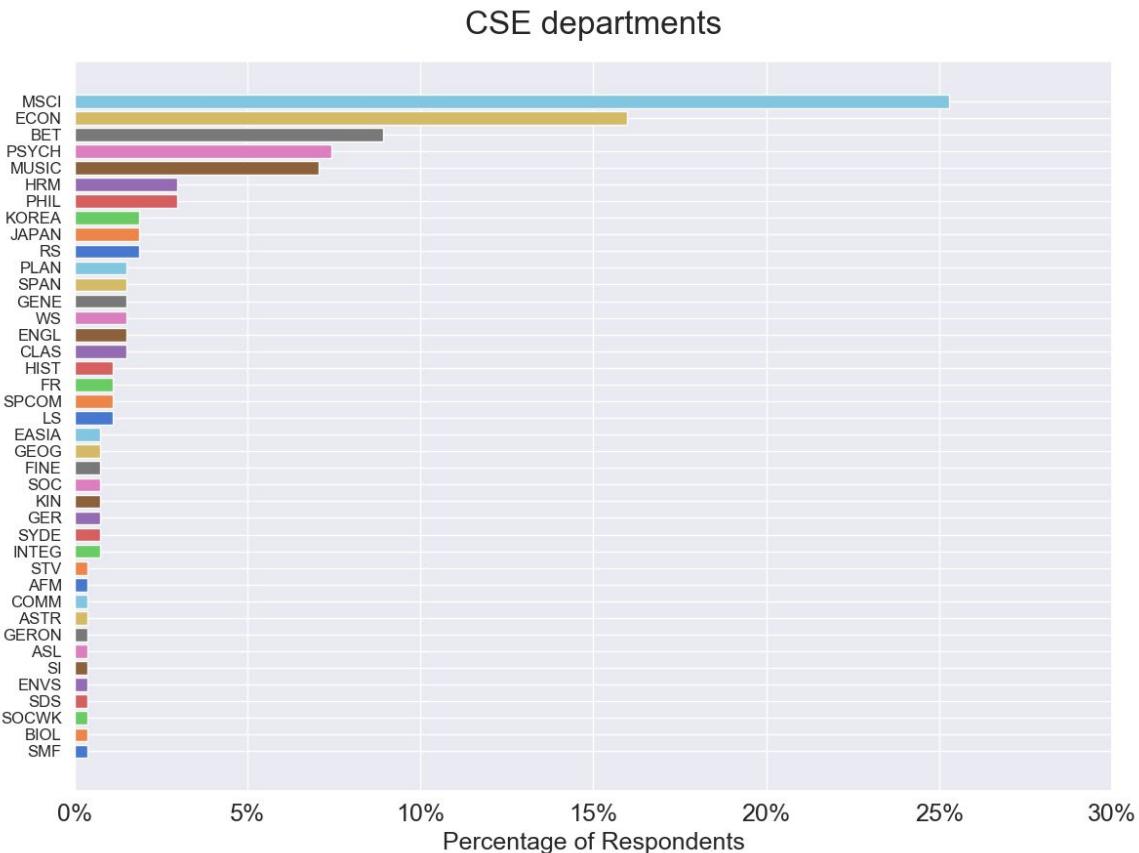
SYDE 162

Human Factors in Design

SYDE 223

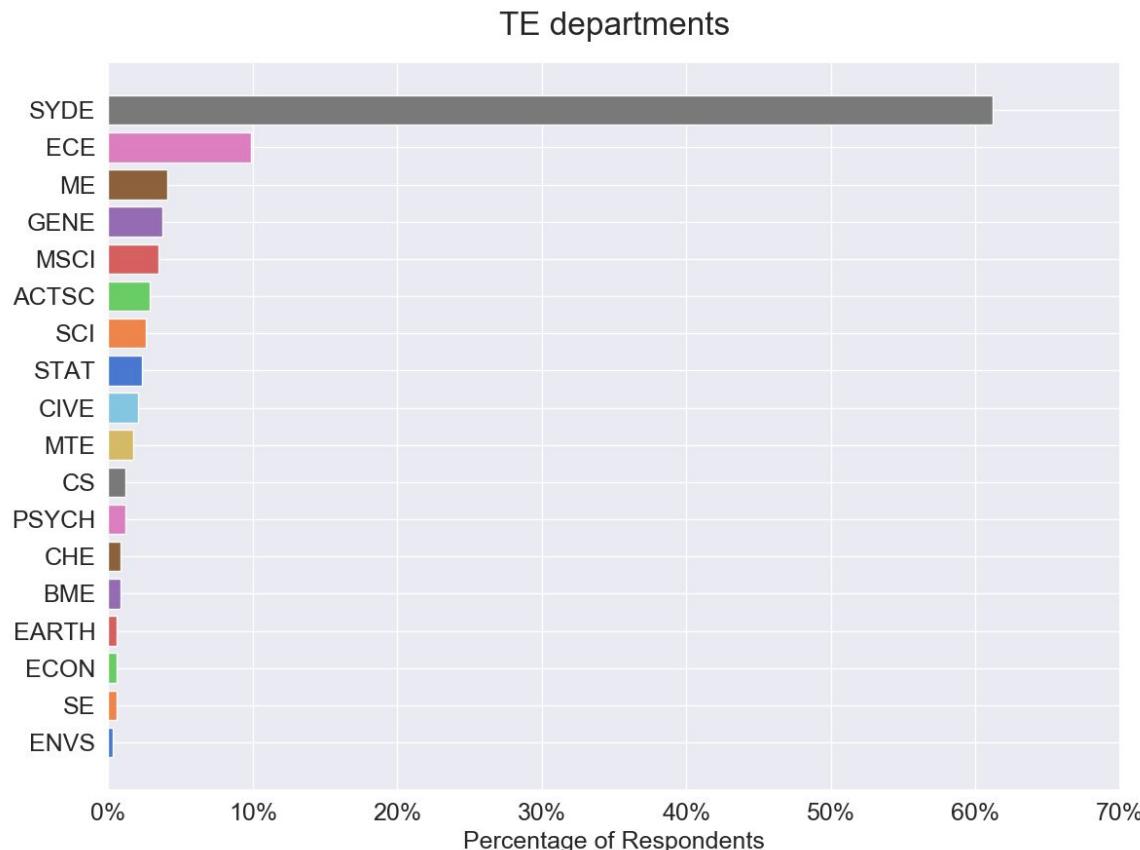
Data Structures and Algorithms

School: Complementary study elective departments



Management sciences electives were the most popular. This is partly because the management sciences degree option is the option that requires the least number of courses for SYDE students.

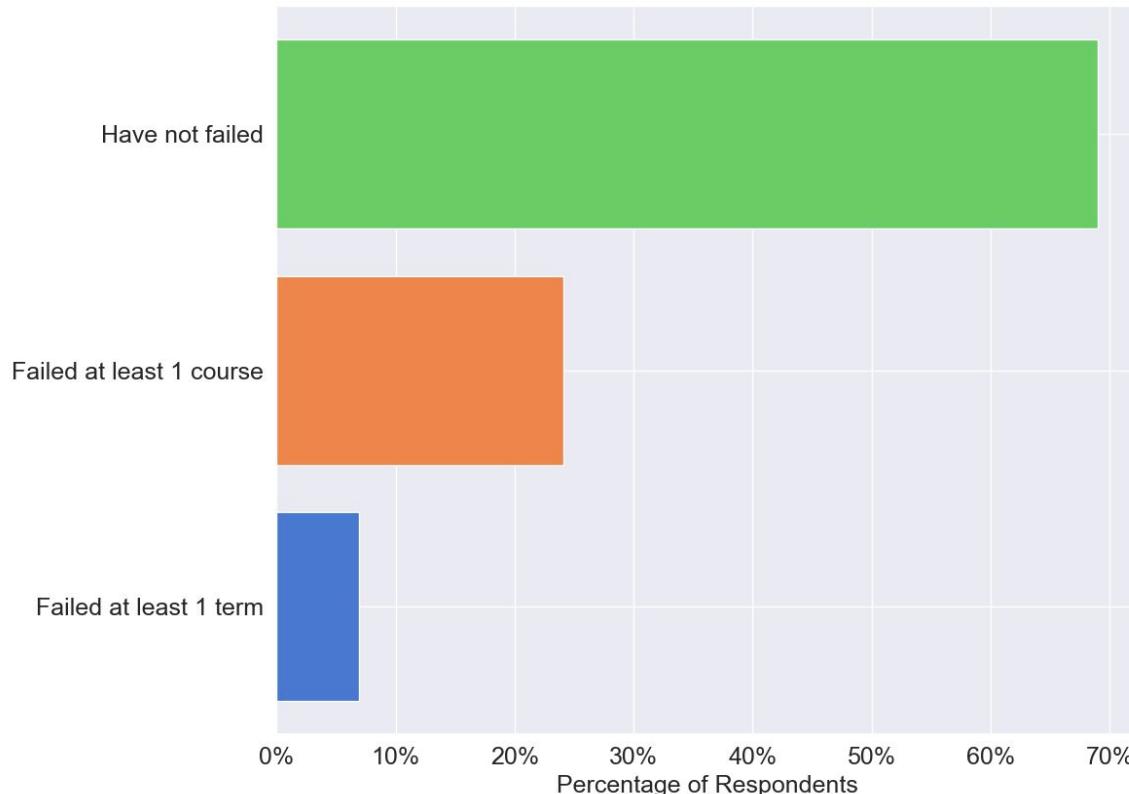
School: Technical elective departments



SYDE students liked to take technical electives from the SYDE department. Some of us just weren't ready to leave E5.

School: Failing

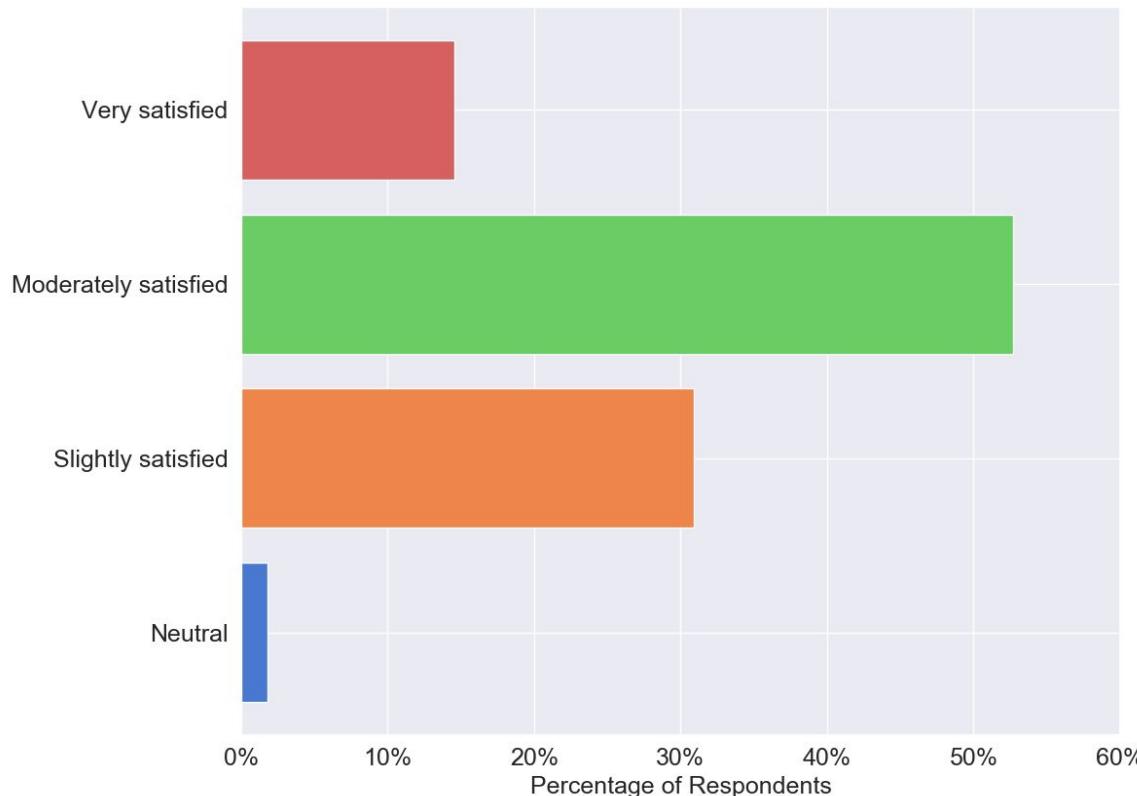
Have you failed a course or term in SYDE?



69% of respondents never failed a course.

School: Satisfaction with design courses and projects

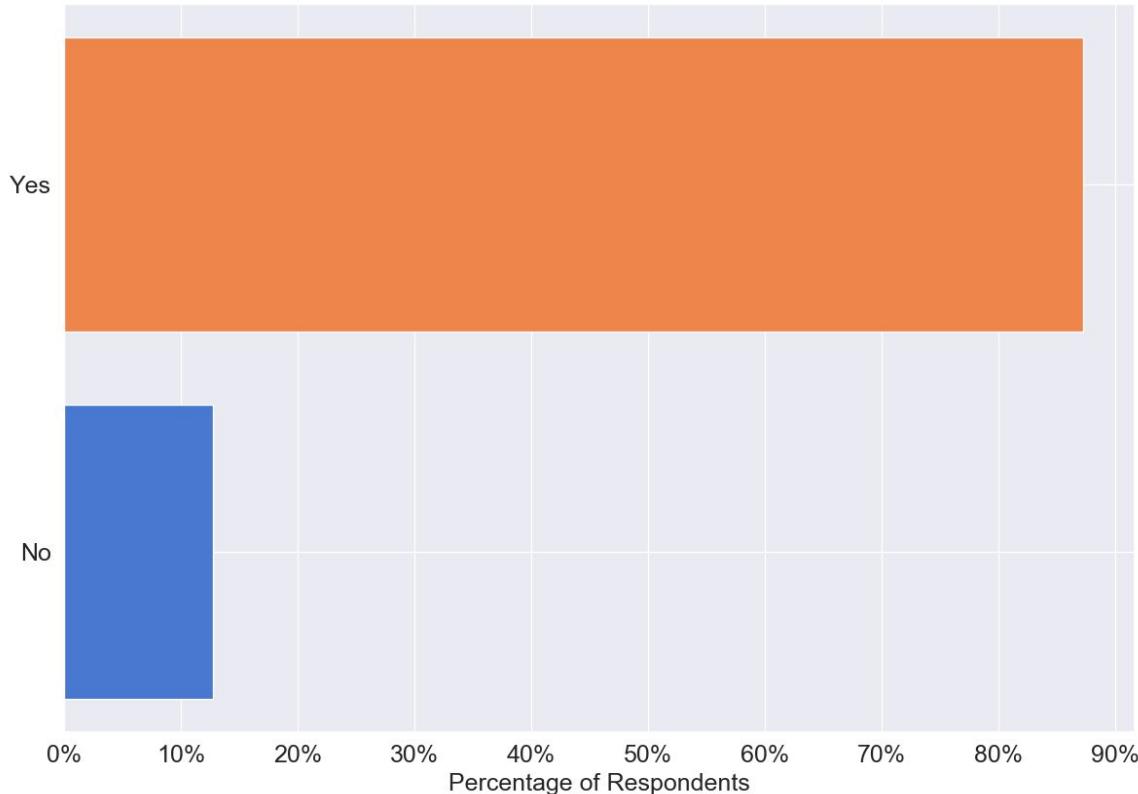
How satisfied were you with the design courses and projects?



For a program called Systems Design Engineering, it's good to know that for the most part, we were satisfied with the design aspects of our degree.

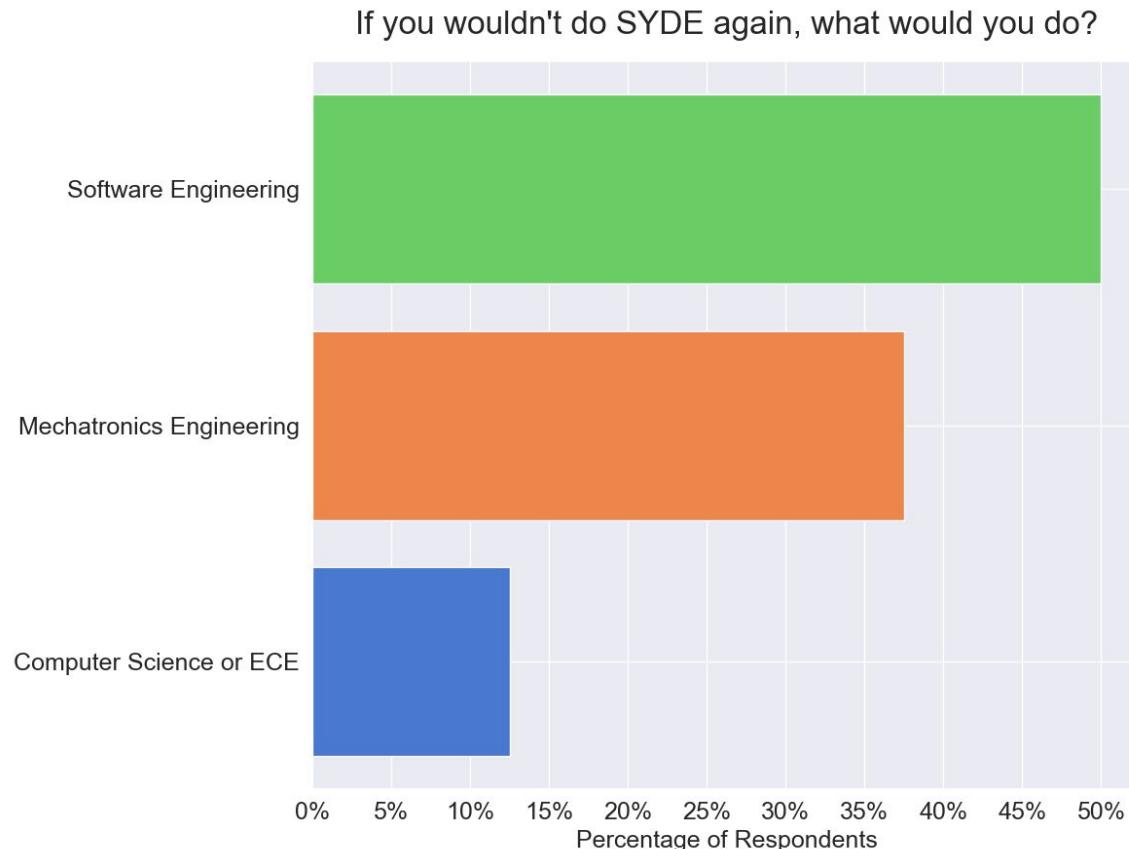
School: Would you choose SYDE again?

If you could go back in time, would you still do SYDE?



The majority of our class would do SYDE again.

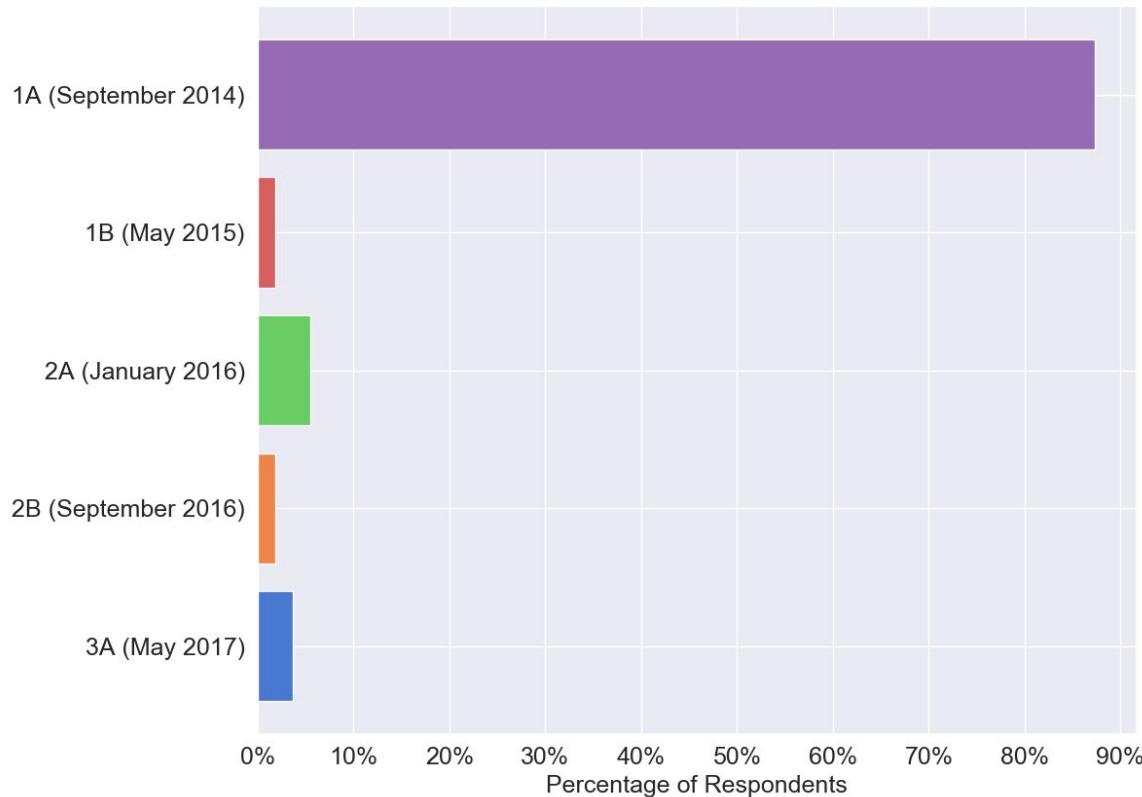
School: If you wouldn't choose SYDE again, what would you choose?



Of the respondents who wouldn't do SYDE again, everyone still wanted to be in an engineering or software-related program.

School: When did you join the SYDE 2019 cohort?

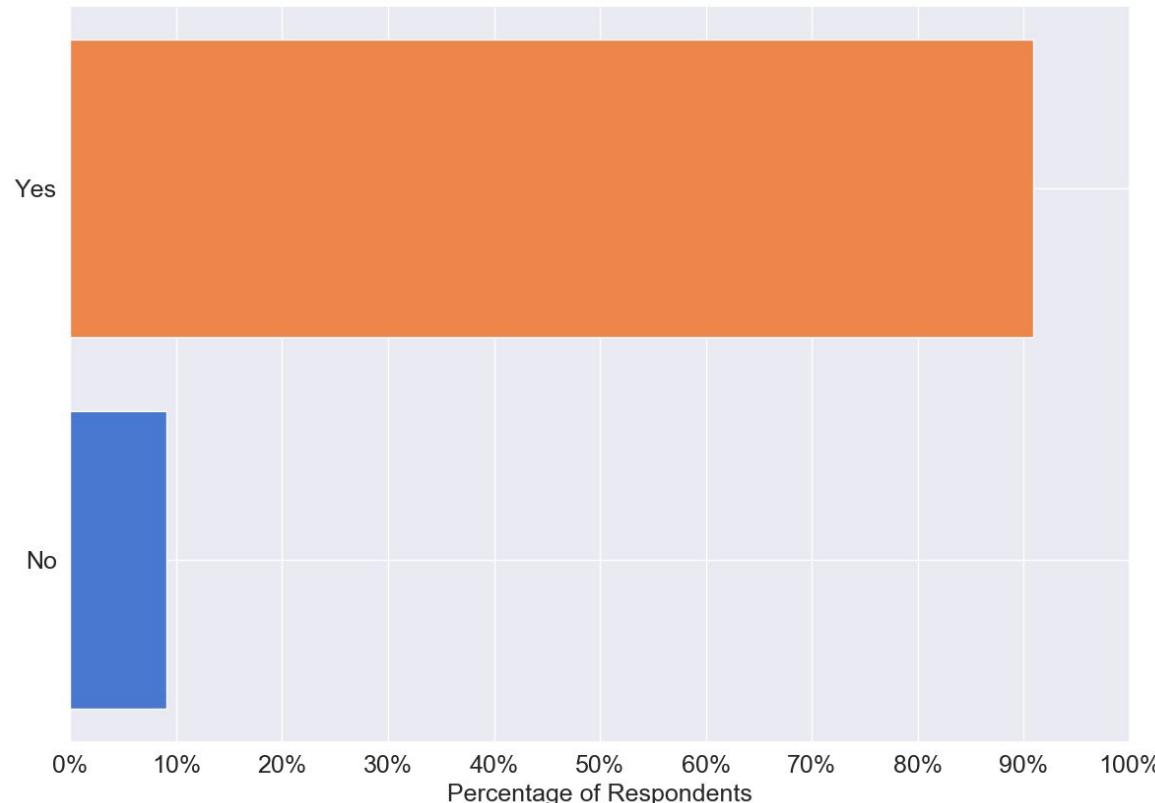
When did you join the SYDE 2019 cohort?



Most of our graduating class were from our original starting class.

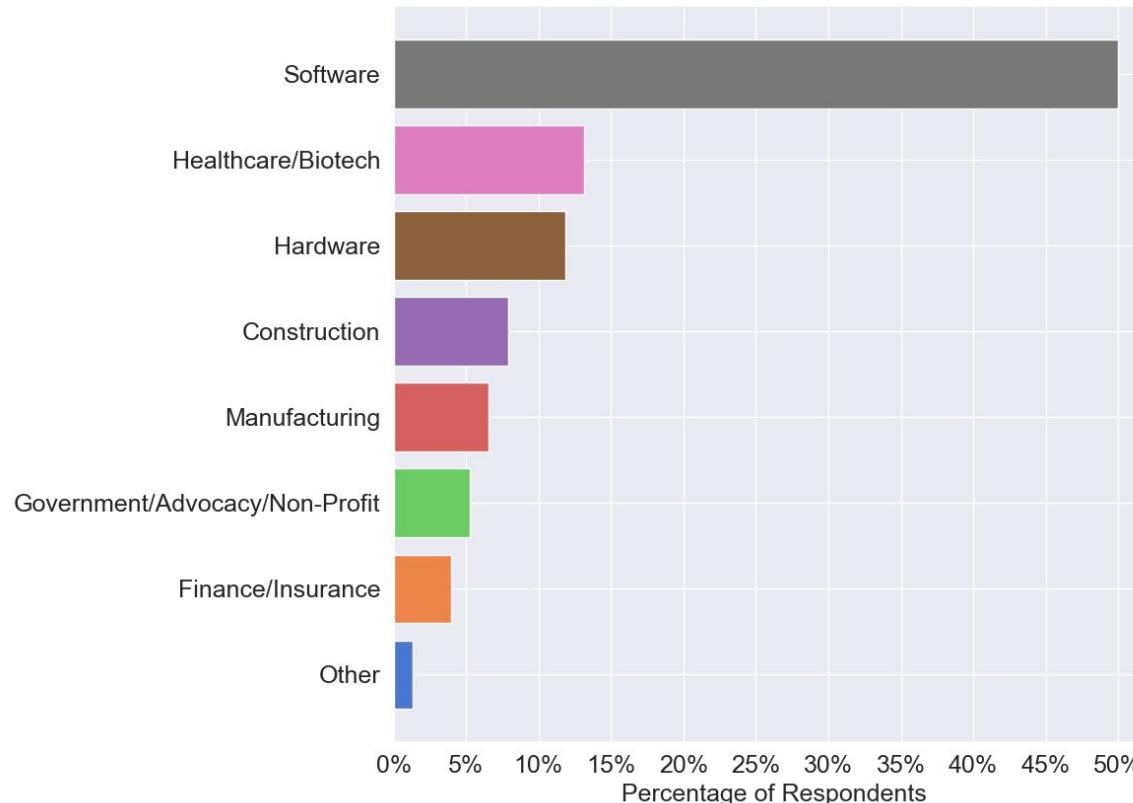
School: Fourth year design project (FYDP) SYDE-only?

Did your FYDP group consist solely of SYDE students?



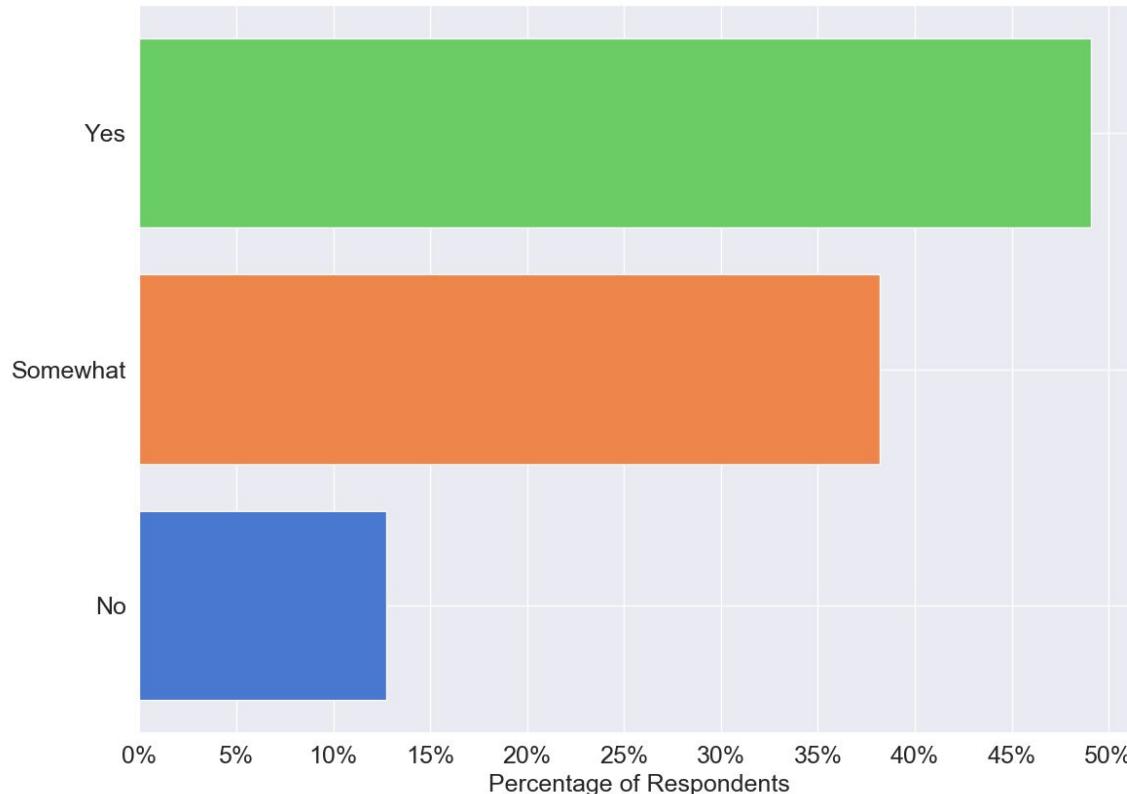
School: FYDP Domain

What domain most accurately describes your FYDP?



School: Are you proud of your FYDP?

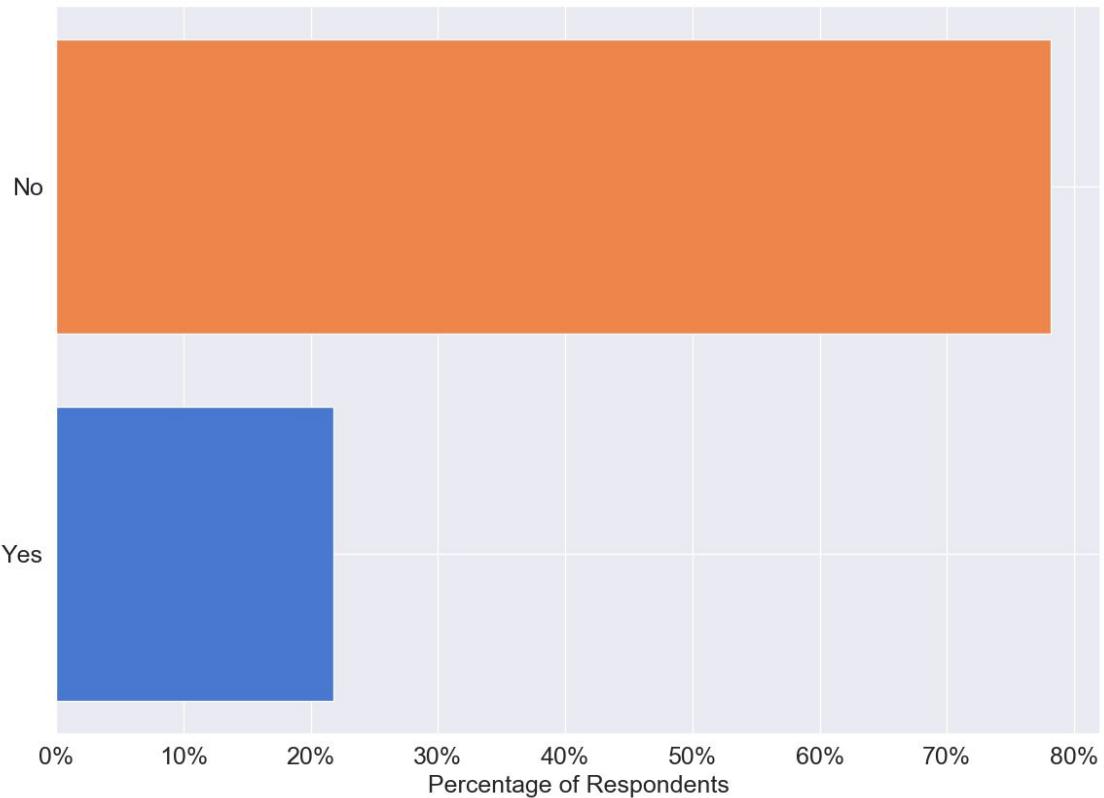
Are you proud of your FYDP?



Yikes.

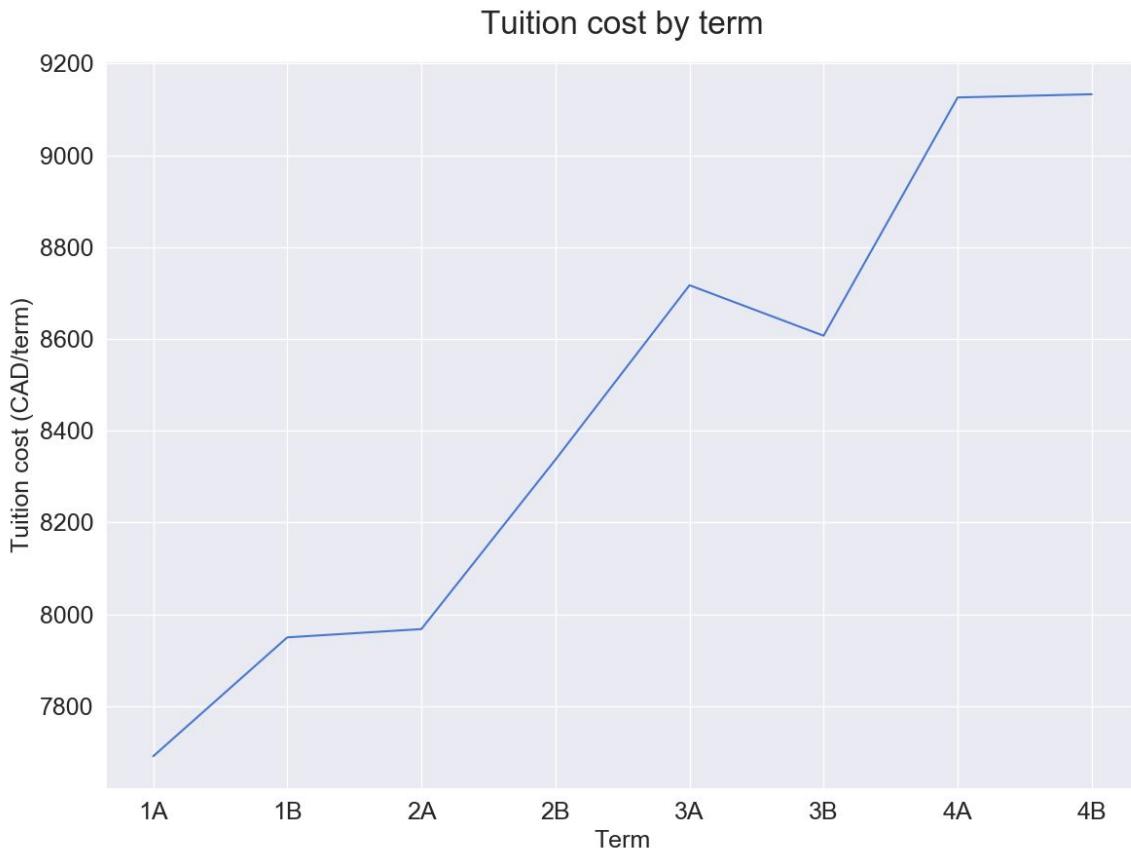
School: Continue FYDP after grad?

Do you or your group plan to pursue your FYDP further beyond 4B?



Best of luck friends!

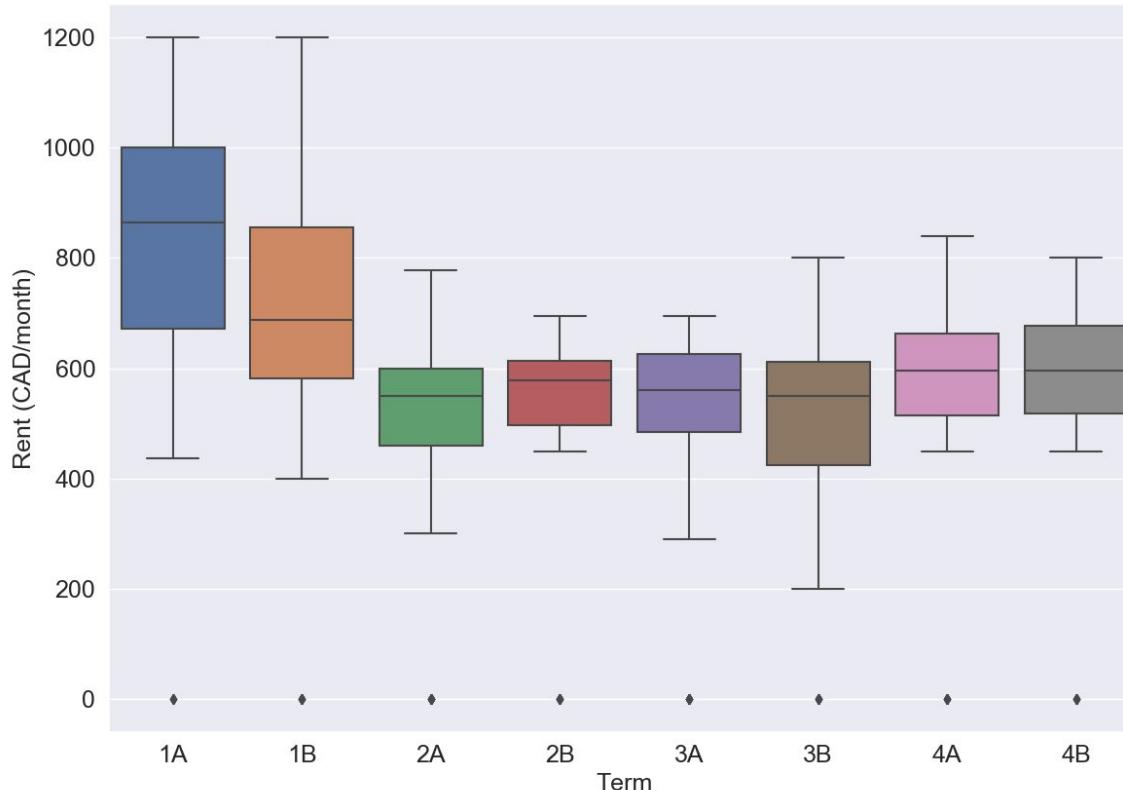
School: Tuition costs by term



Tuition increased an average of 240 CAD/term. The total tuition cost for the degree was 67,529 CAD. This figure only reflects domestic tuition.

School: Rent

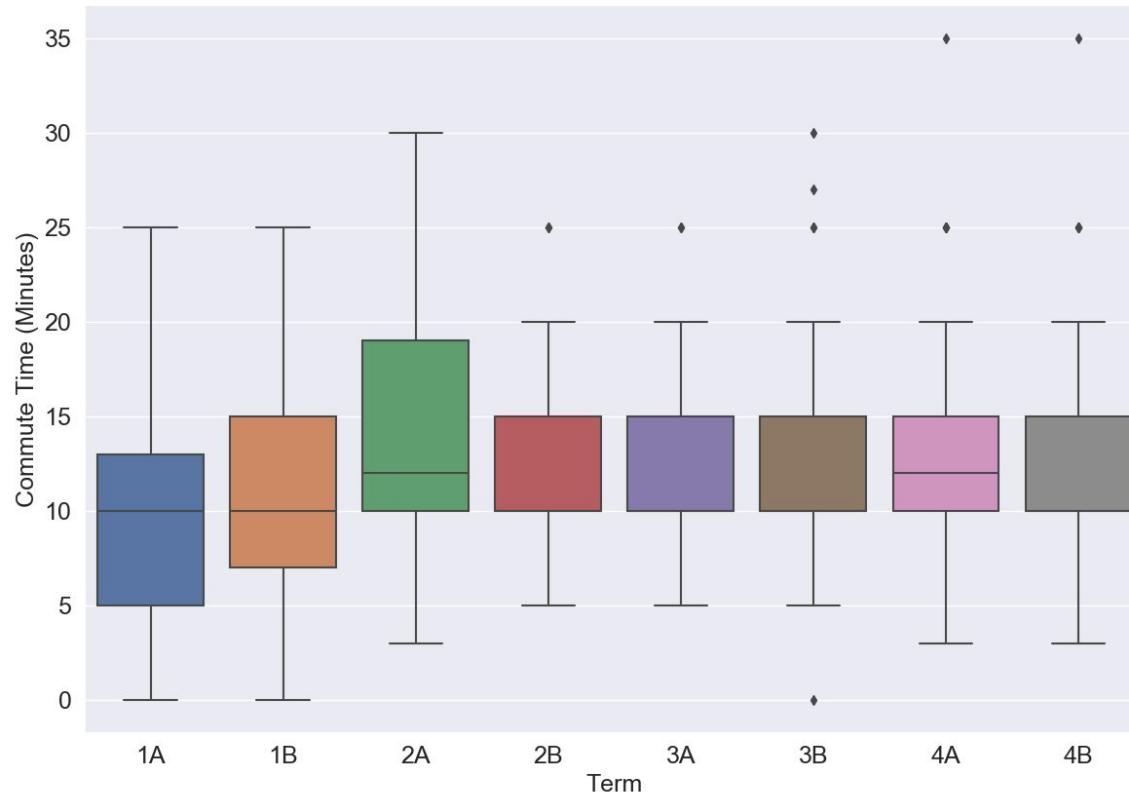
How much did you pay for rent each school term?



Rent was substantially higher in first year because of high residence costs.

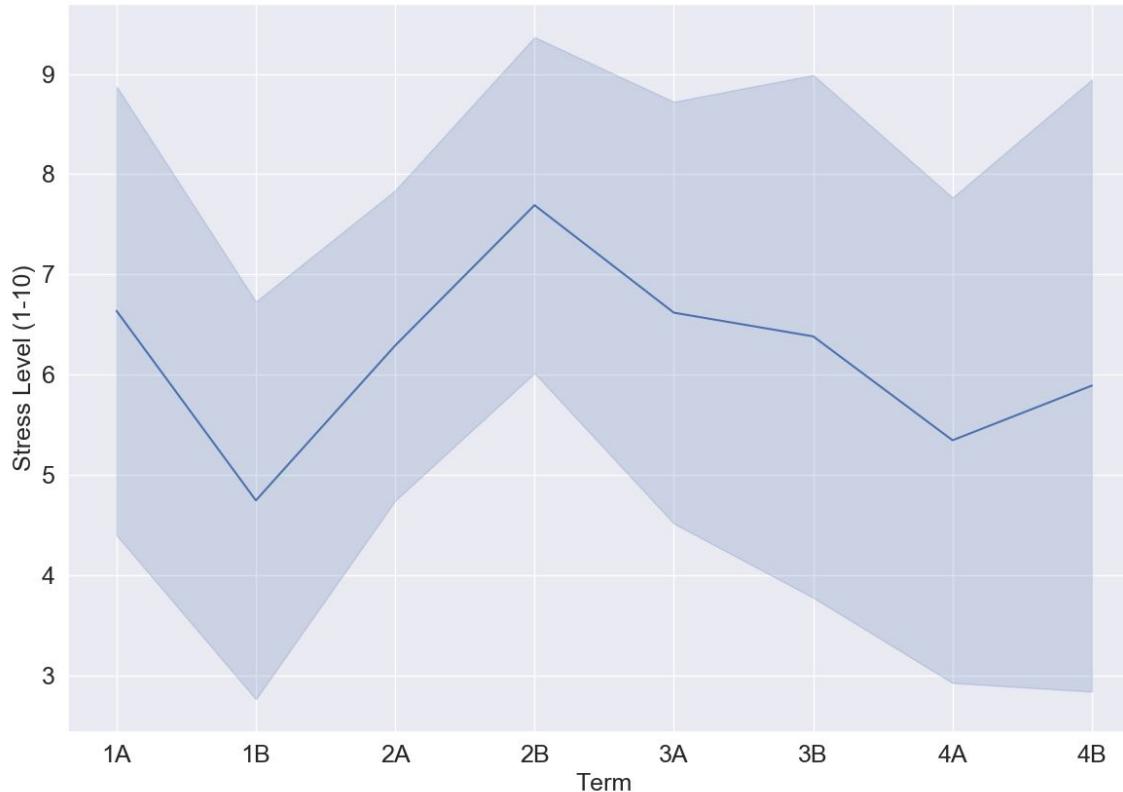
School: Commute

How long was your commute to school?



School: Stress

School Stress

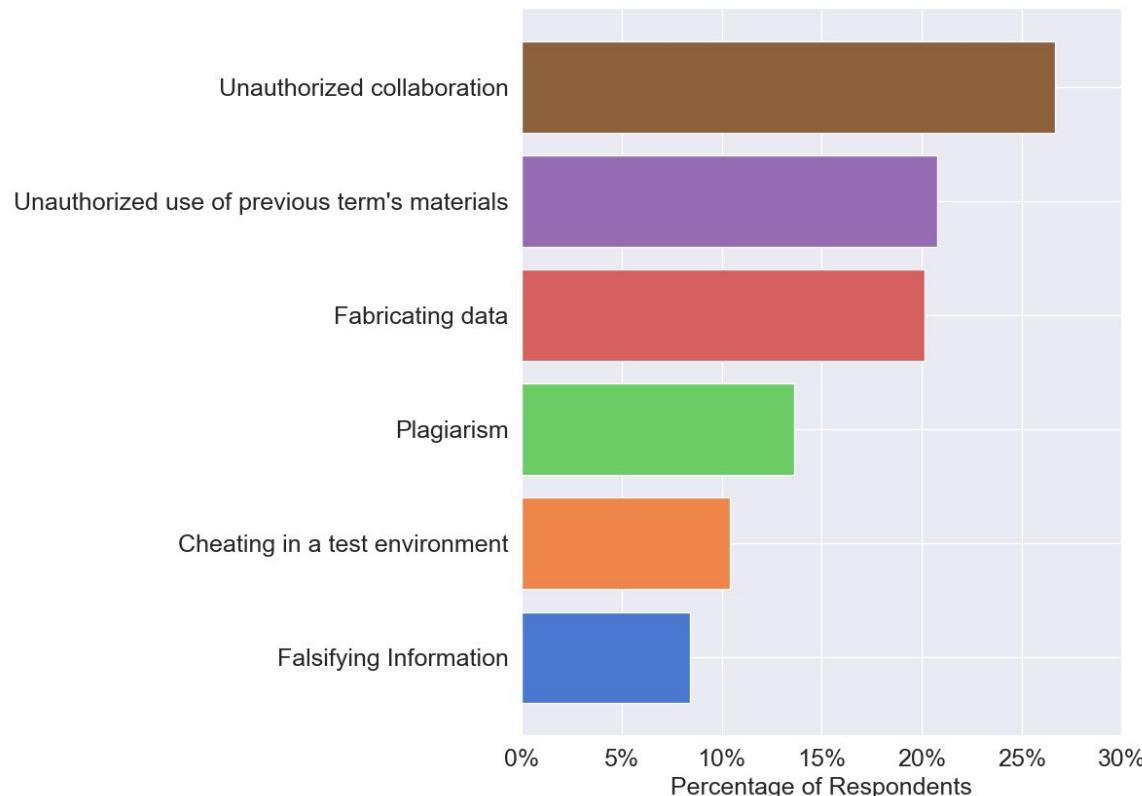


The story of 2B or not 2B.

2B was notoriously touted as being the most difficult term of them all, and the highest average stress rating for this term helps support this claim.

School: Cheating

Did you engage in any forms of cheating?



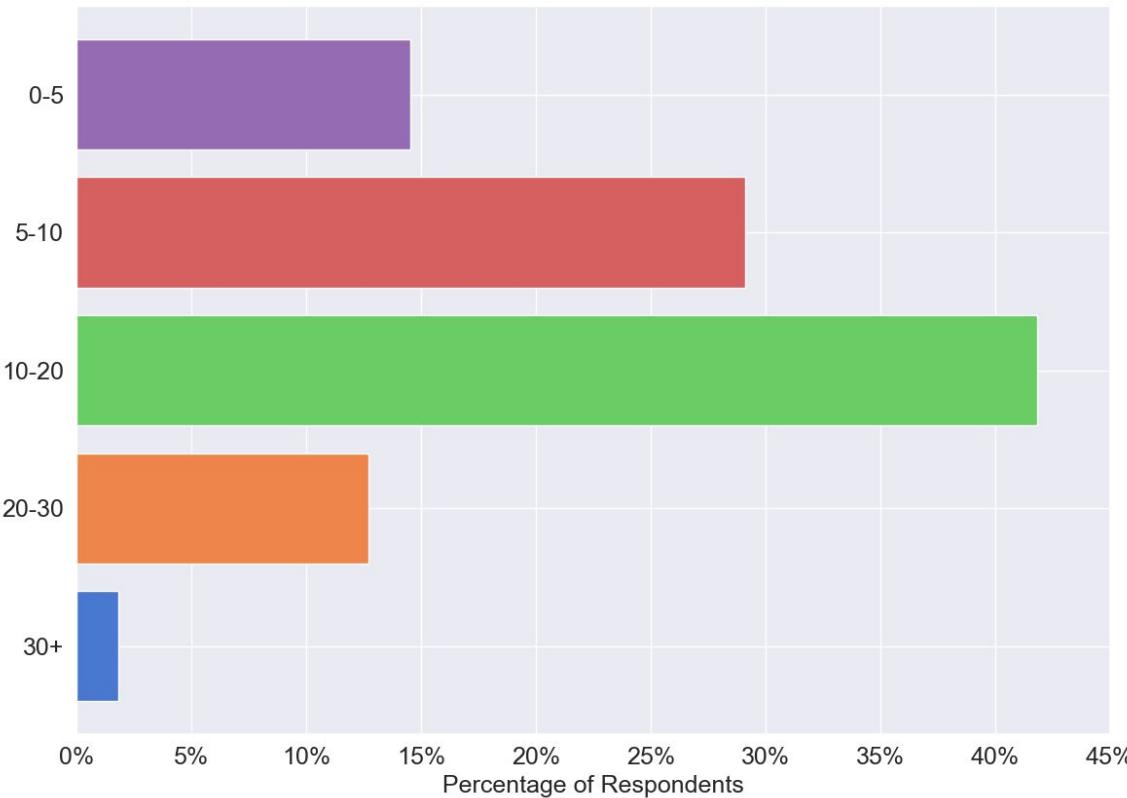
Just to be clear, no data was fabricated for this class profile.

Social & Lifestyle

Friends, Extracurriculars, Community, Mental Health

Social & Lifestyle: Friends in SYDE 2019

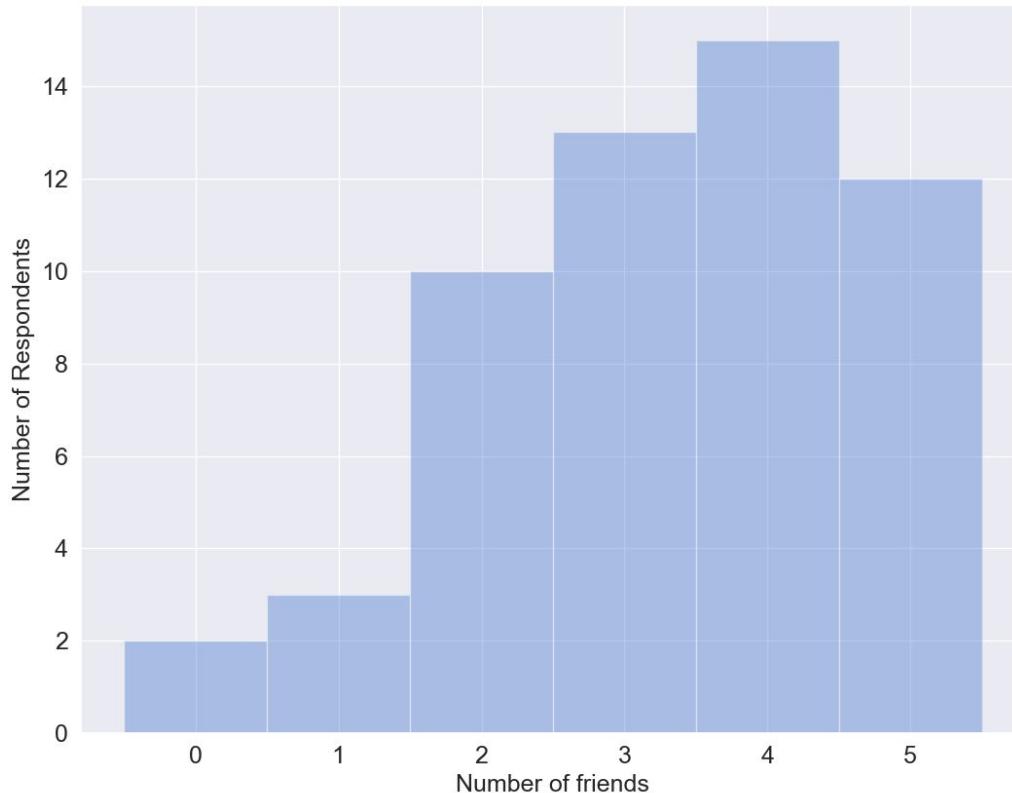
How many friends do you have in the SYDE 2019 class?



We're one big family after all.

Social & Lifestyle: Close friends in SYDE

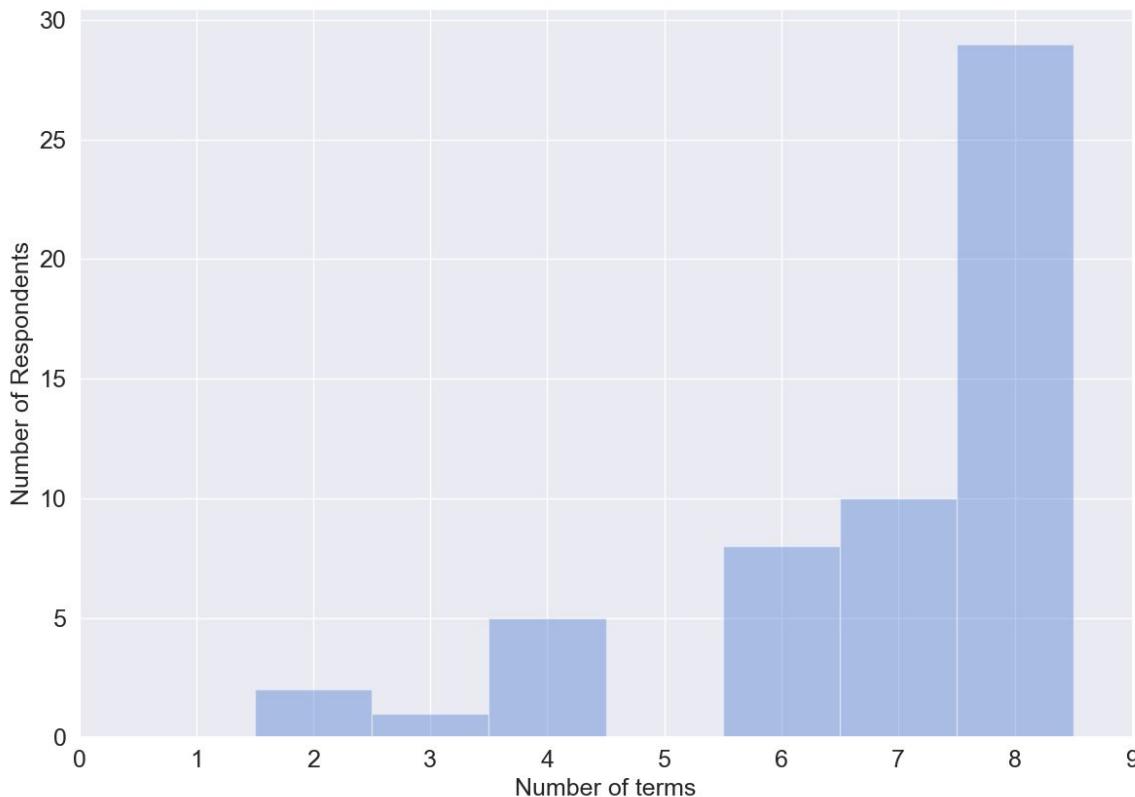
Of your 5 closest friends you've made in university, how many are in SYDE?



We were a tight-knit bunch.

Social & Lifestyle: SYDE social event attendance

How many terms did you attend at least one SYDE social event?

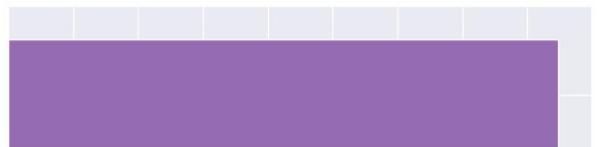


The majority of respondents attended a SYDE social event every term. It's safe to say that we're a pretty social class.

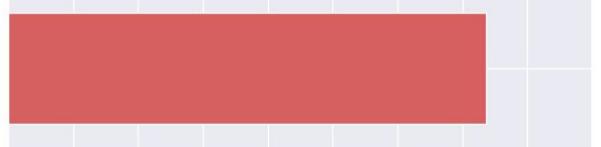
Social & Lifestyle: Intergenerational SYDE activities

Intergenerational SYDE activities

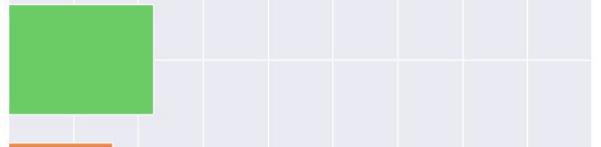
Receive advice from an upper year



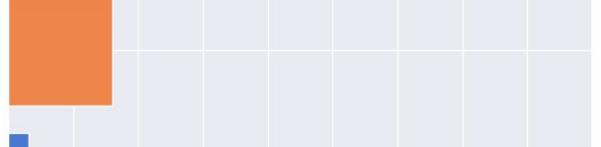
Give advice to a lower year



Give a co-op job referral to lower year



Receive a co-op job referral from an upper year



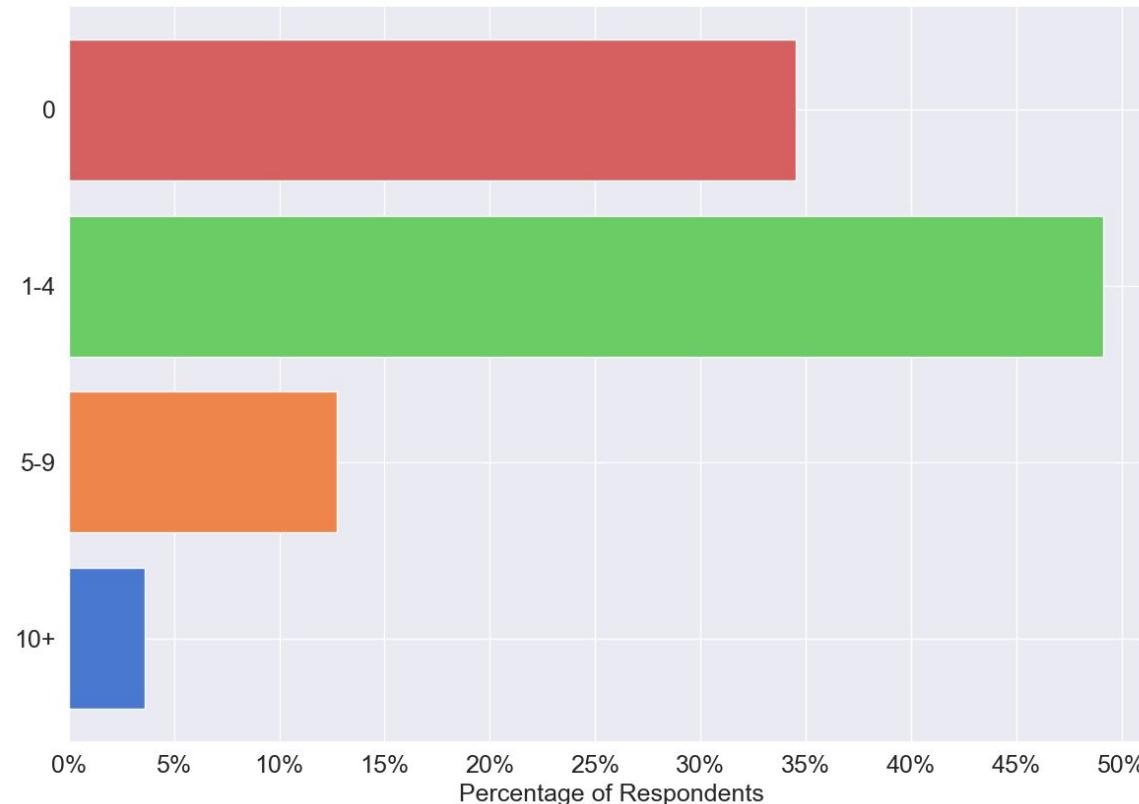
None

0% 5% 10% 15% 20% 25% 30% 35% 40% 45%
Percentage of Respondents

We were about more than just the class of 2019.

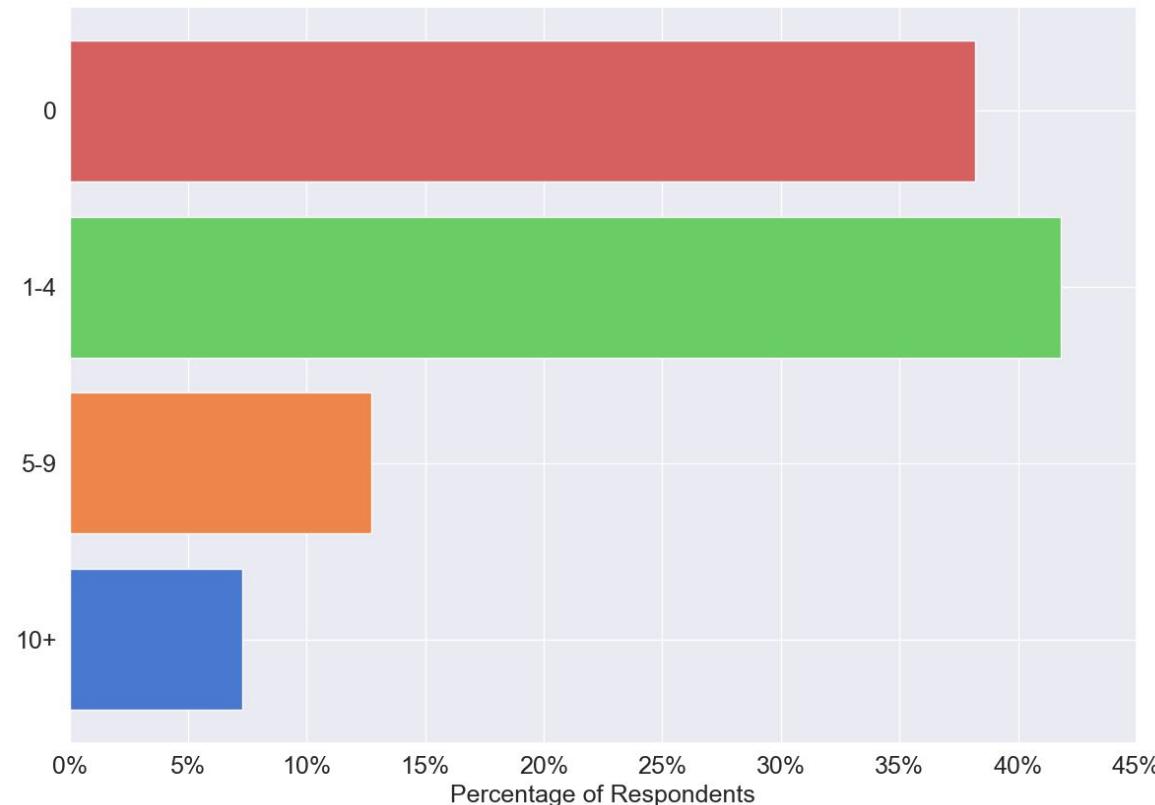
Social & Lifestyle: Contact with upper years

How many upper years are you still in contact with?



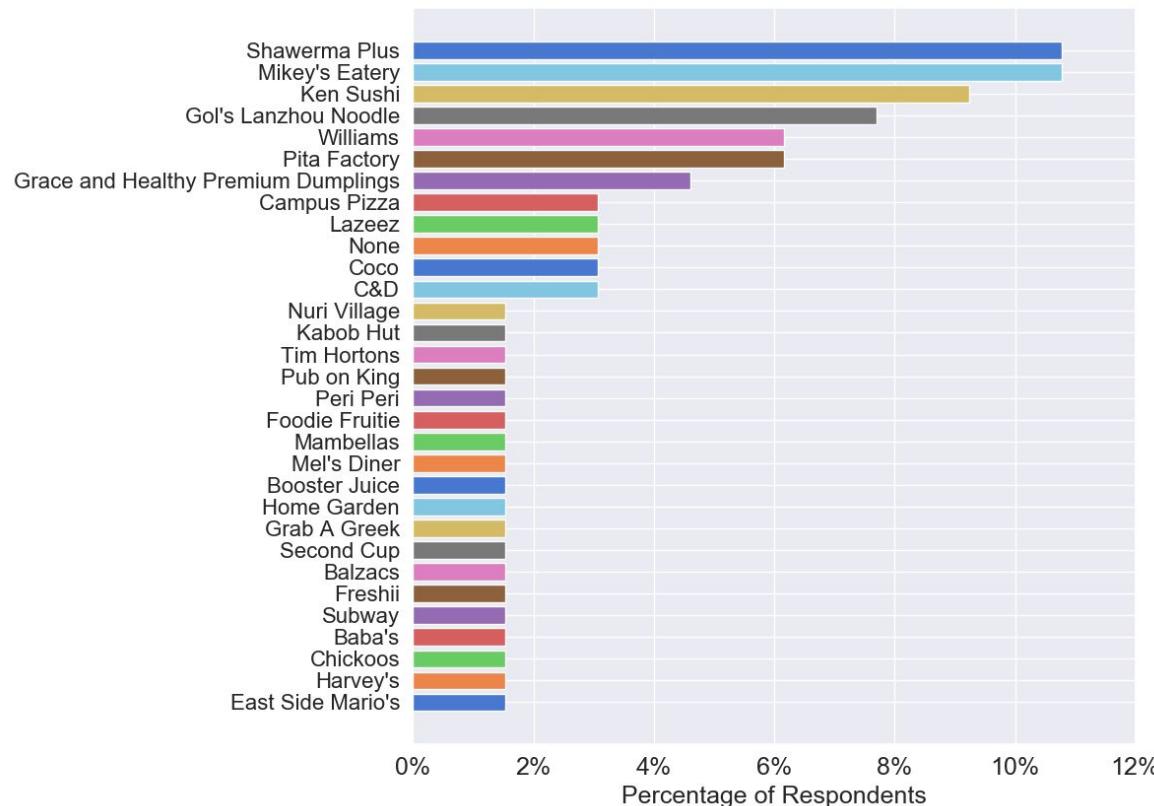
Social & Lifestyle: Contact with lower years

How many lower years are you still in contact with?



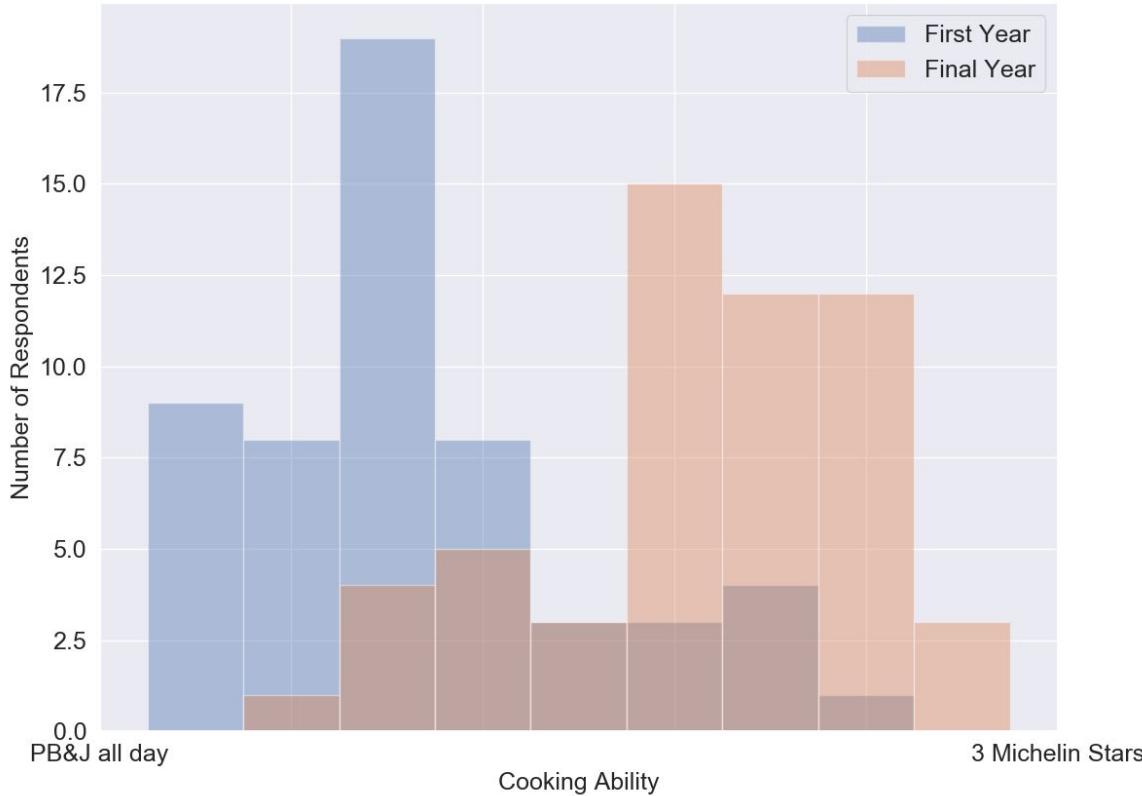
Social & Lifestyle: Favourite restaurant

What was your favourite restaurant?



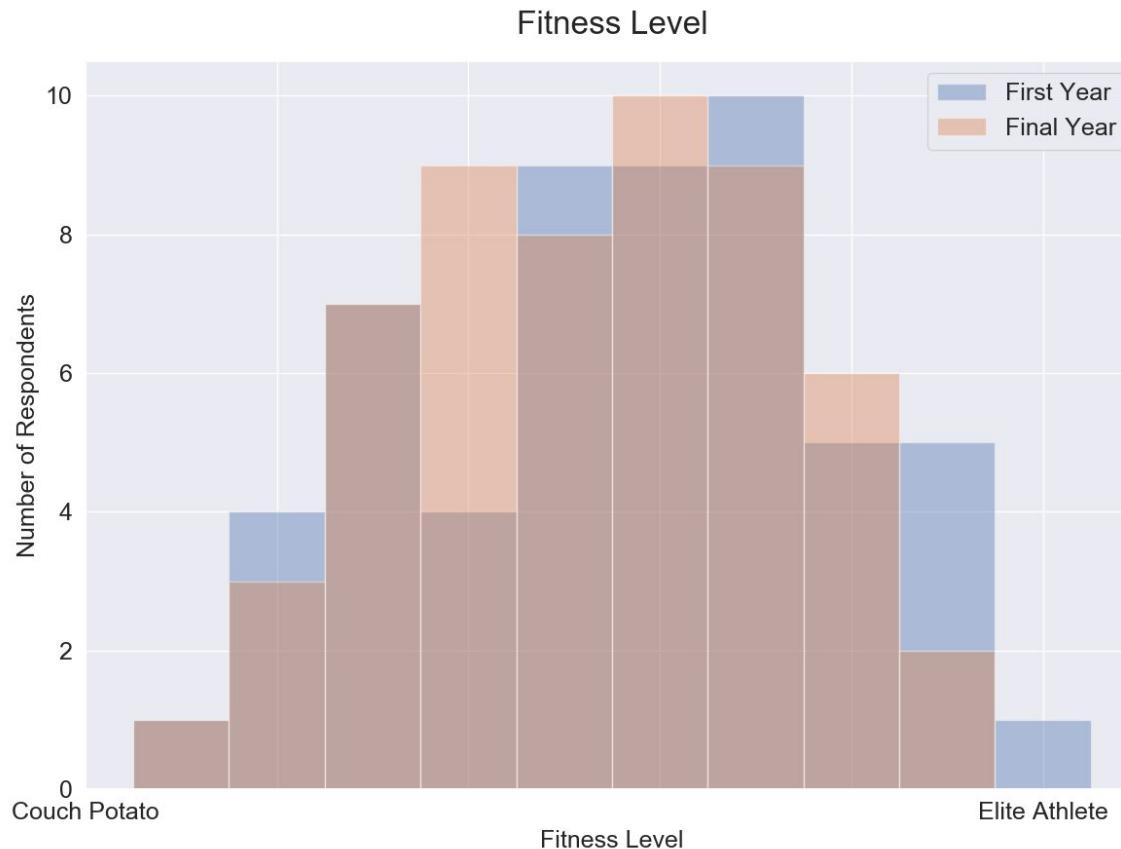
Social & Lifestyle: Cooking Ability

Cooking Ability



Growing up, colourized.

Social & Lifestyle: Fitness



The class' distribution of fitness did not change significantly.

Social & Lifestyle: What advice would you give to yourself in first year?

“Carving your own path and finding out what's best for you will make you the happiest and most successful, try not to follow blindly or get wrapped up in the "hype" of what everyone else here does.”

“Take time to enjoy extracurriculars and find the things you like to do! You'll feel the academic pressure but it's important to realize that grades aren't everything. It took me too long to realize that and find a good balance.”

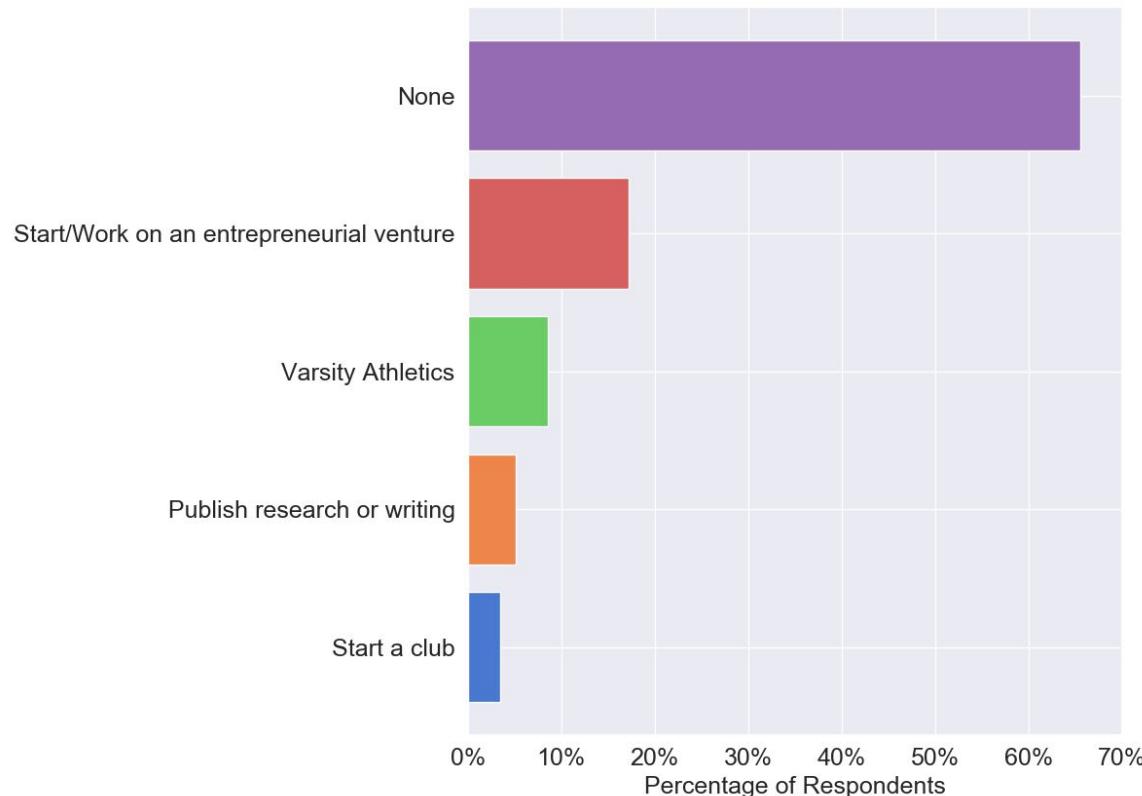
“At the end of it all, it'll be the relationships that matter (not the courses, not the grades, not even the coop jobs). Focus on building strong relationships that will last beyond university.”

“Experiment with different co-ops if you're not sure what you want and don't create artificial pressure for yourself because of what you hear from others.”

“You can't do engineering, especially SYDE, alone. Make friends with the people around you because they'll have your back countless times throughout the term, whether it be group members, lecture notes or late nights at the computer lab :^)”

Social & Lifestyle: University endeavours

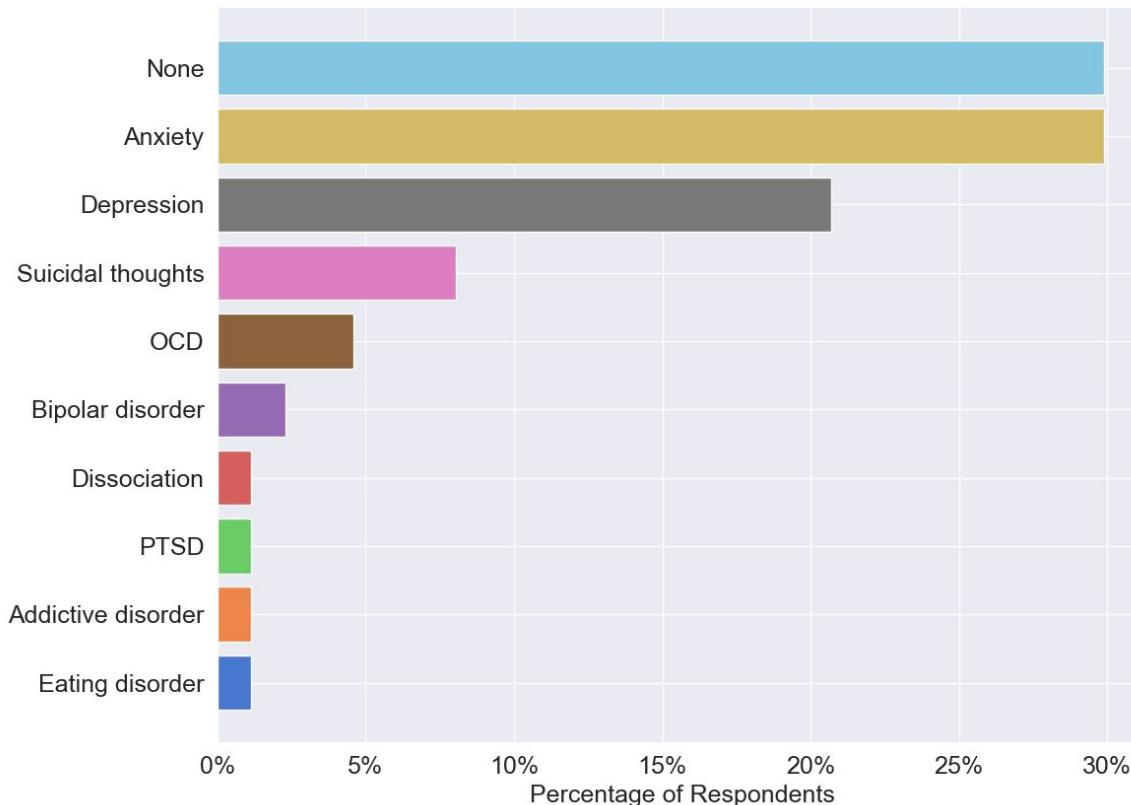
Did you do any of the following during university?



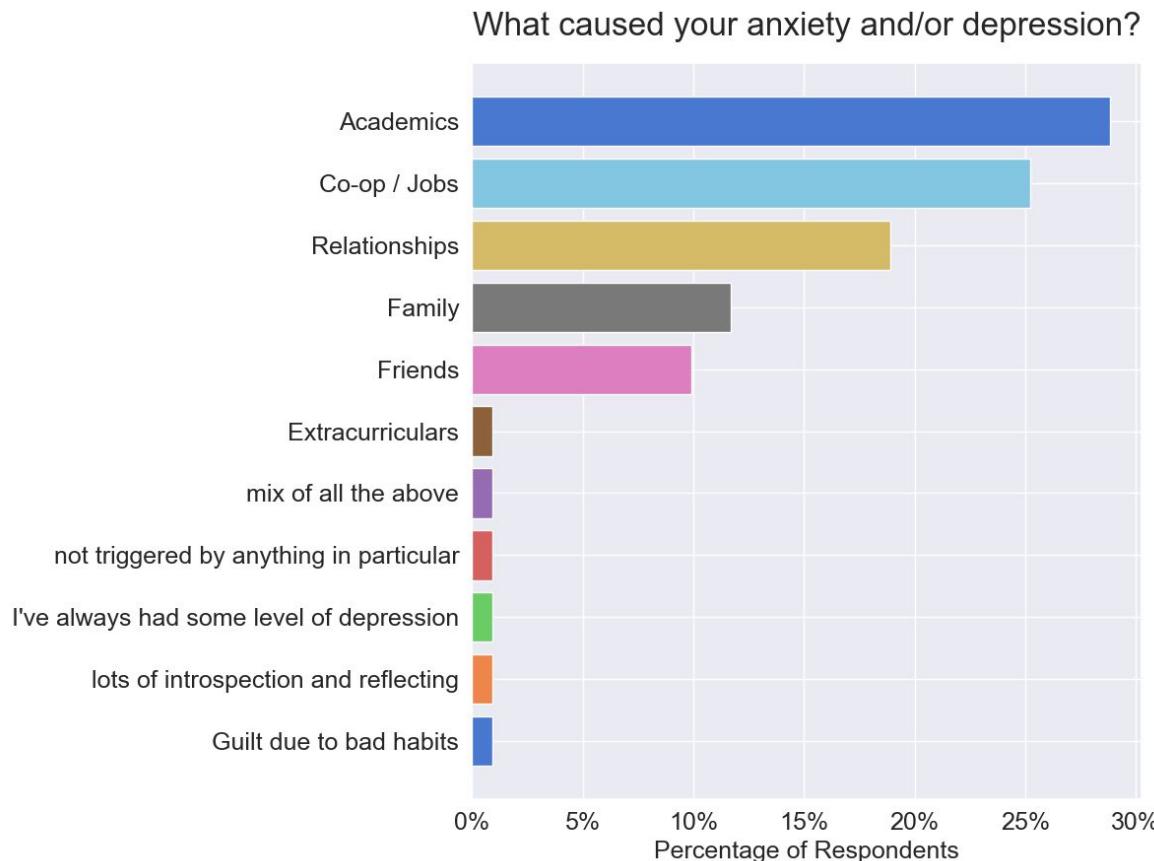
9 respondents started or worked on an entrepreneurial venture.

Social & Lifestyle: Mental health concerns

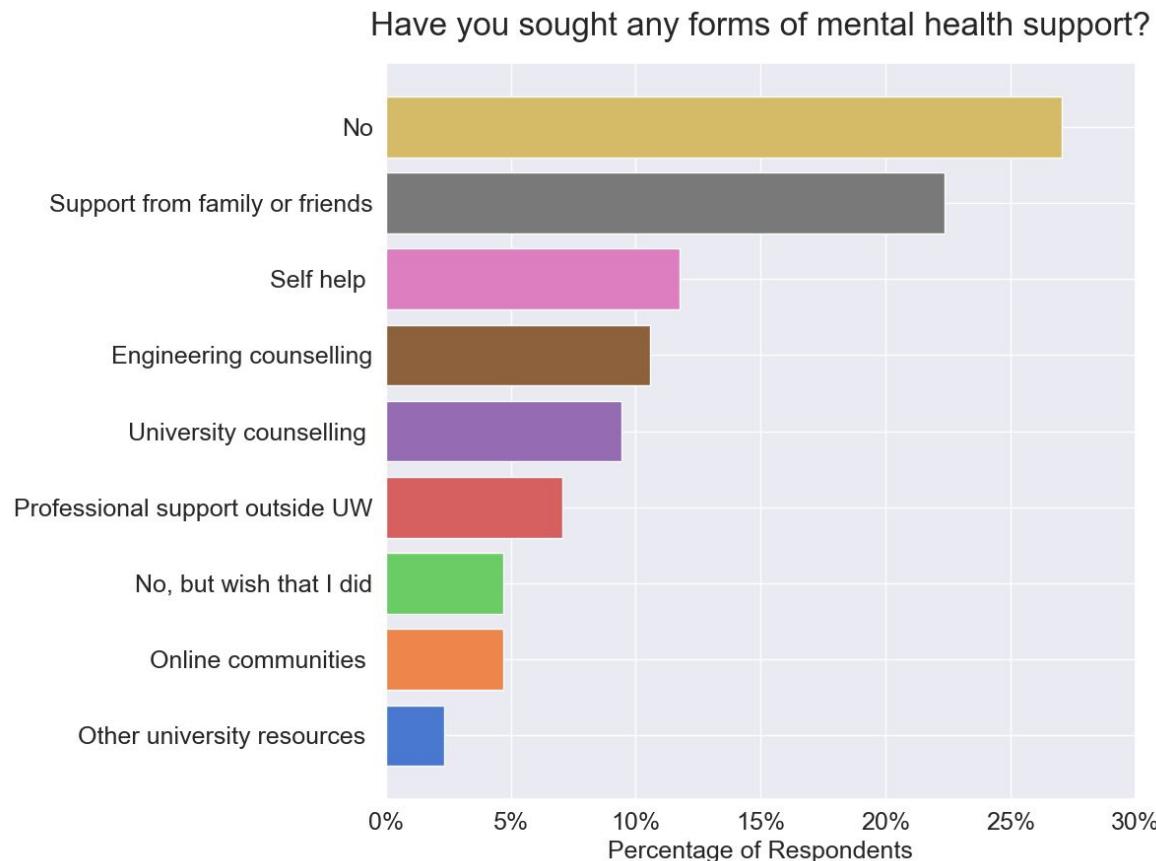
Have you experienced any mental health concerns?



Social & Lifestyle: Sources of anxiety and/or depression

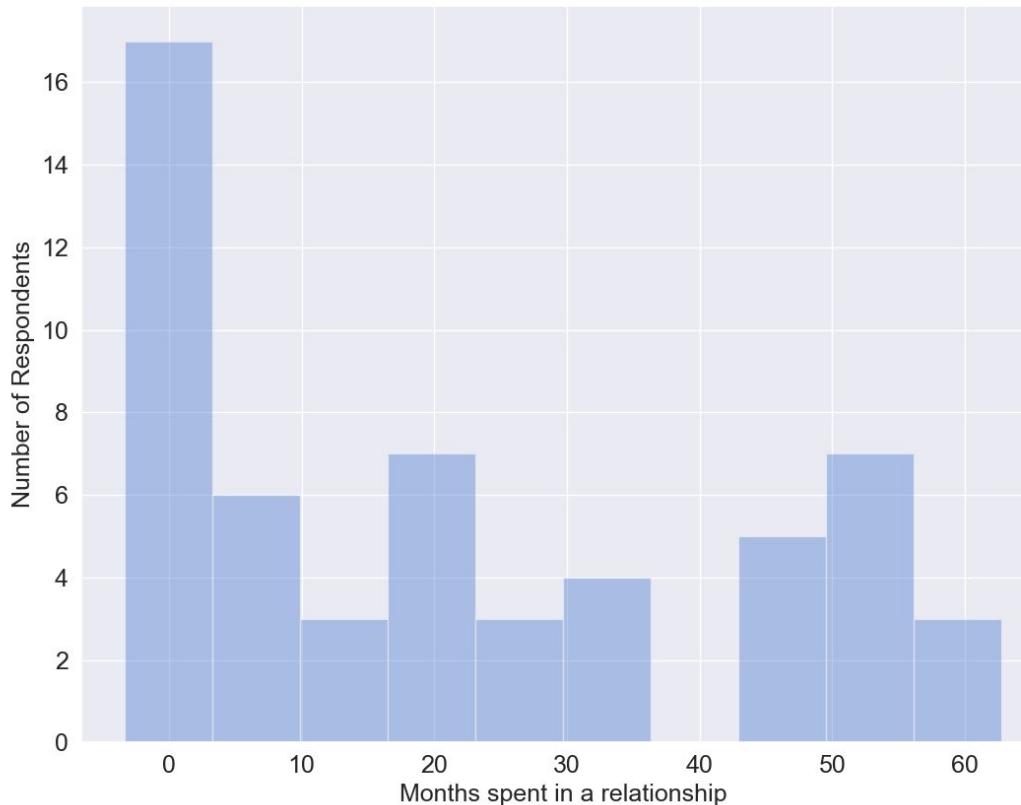


Social & Lifestyle: Mental health support

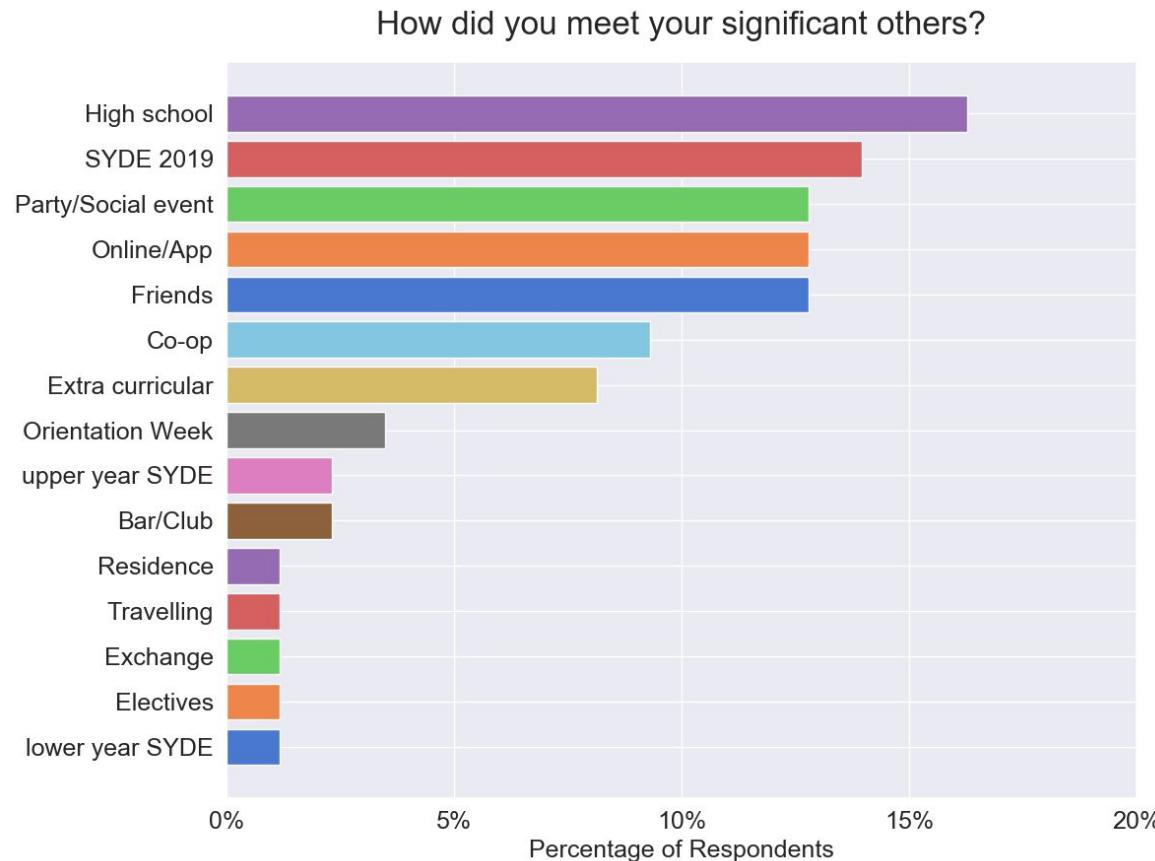


Social & Lifestyle: Months in a relationship

How much of your university career, in months, was spent in a relationship?

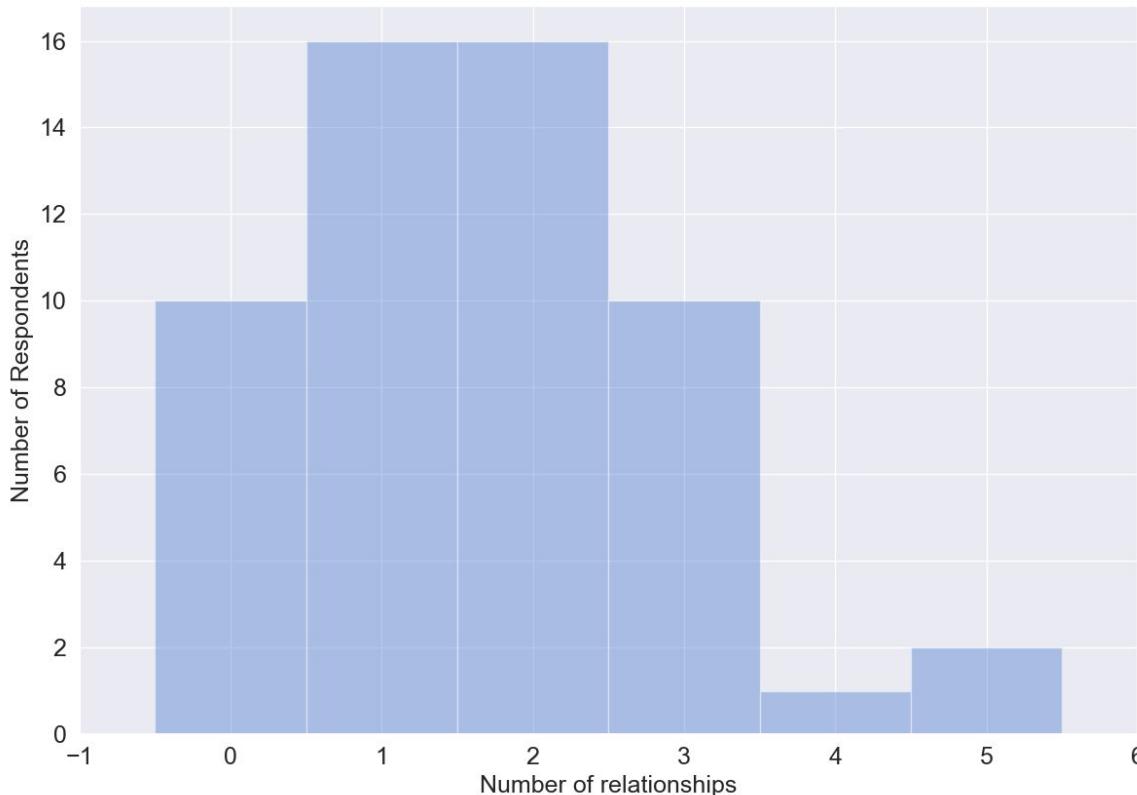


Social & Lifestyle: How did you meet your significant others?



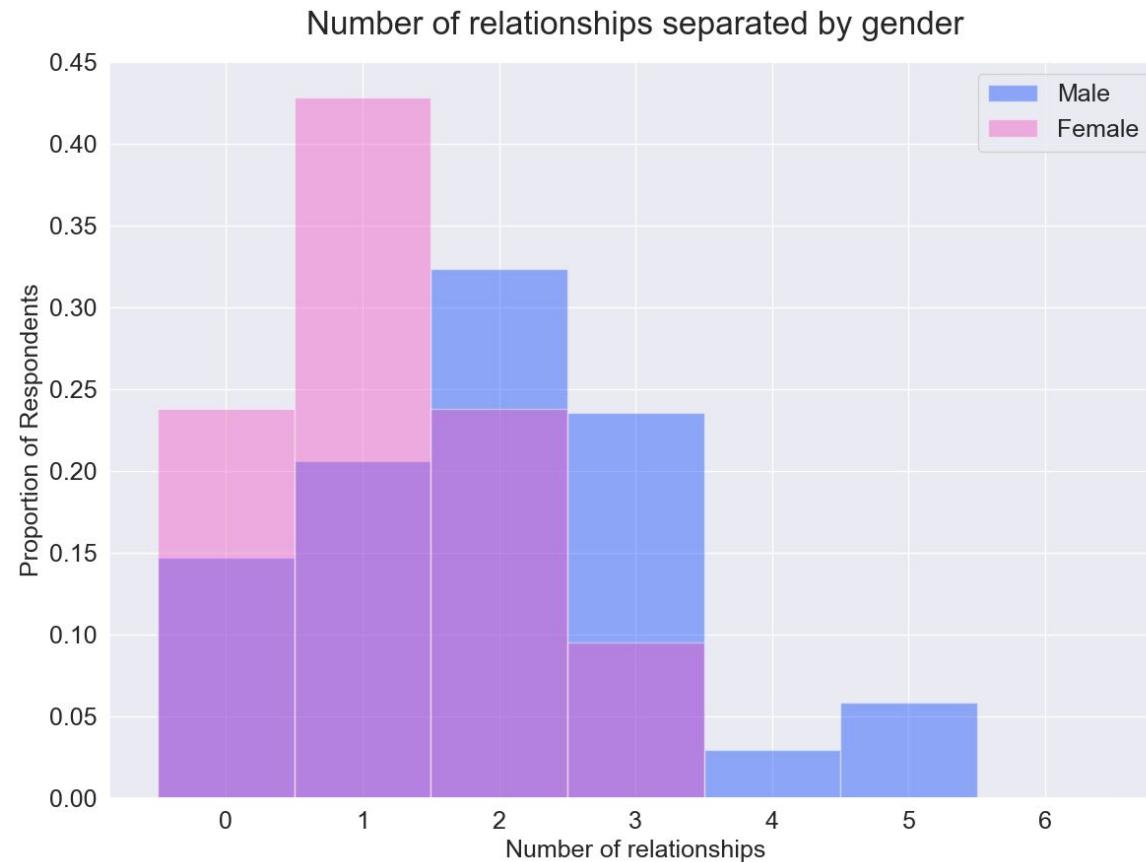
Social & Lifestyle: Relationships

How many relationships did you have during university?



Most respondents had 1 to 2 relationships over the course of university. Nobody had -1 so that's positive!

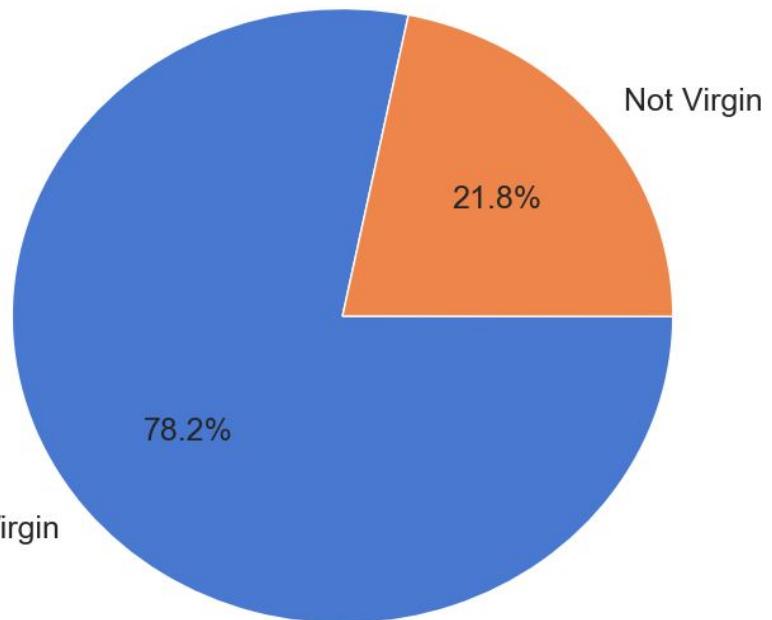
Social & Lifestyle: Relationships separated by gender



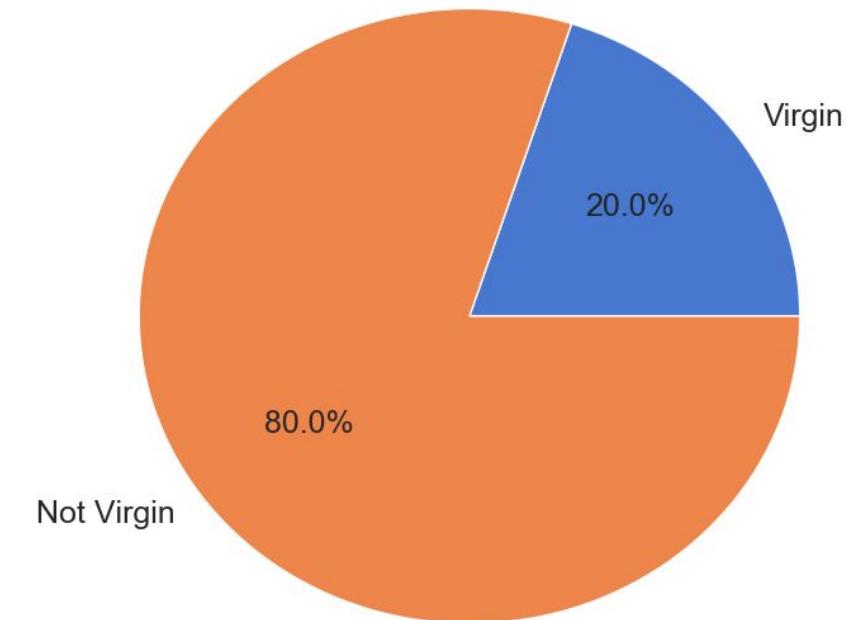
On average, males had 1.97 relationships throughout university while females had 1.19 relationships.

Social & Lifestyle: Virginity

Before University

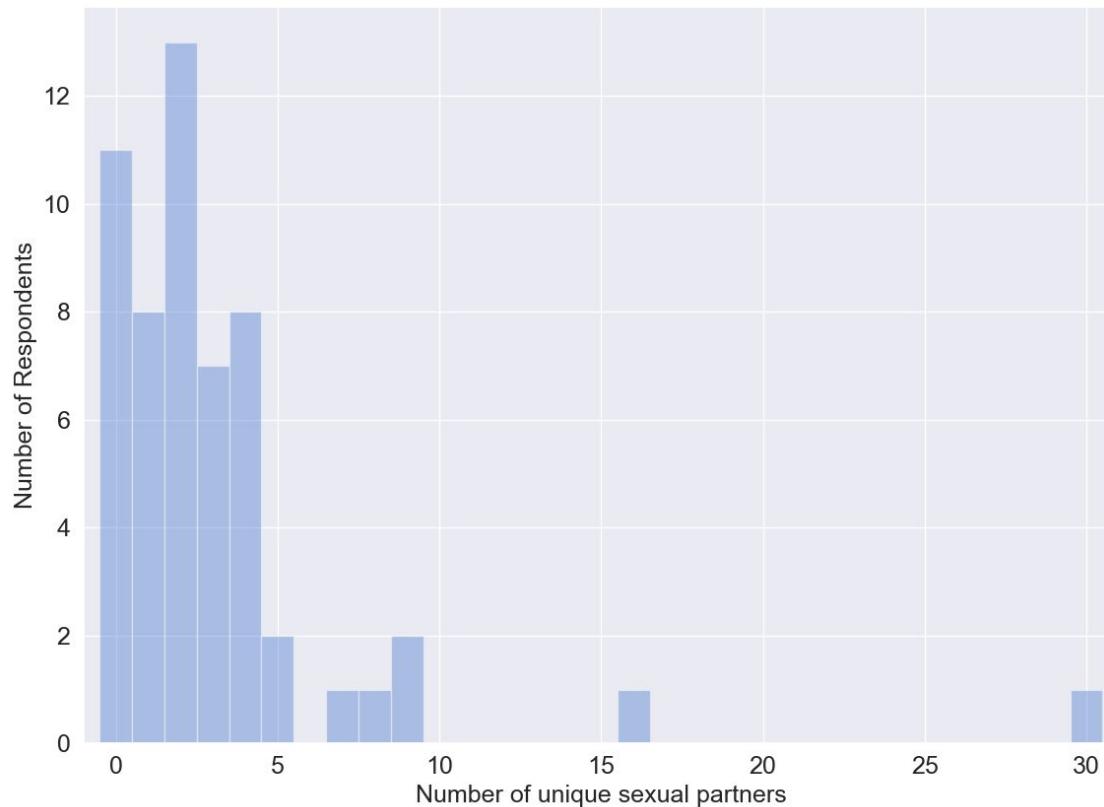


After University

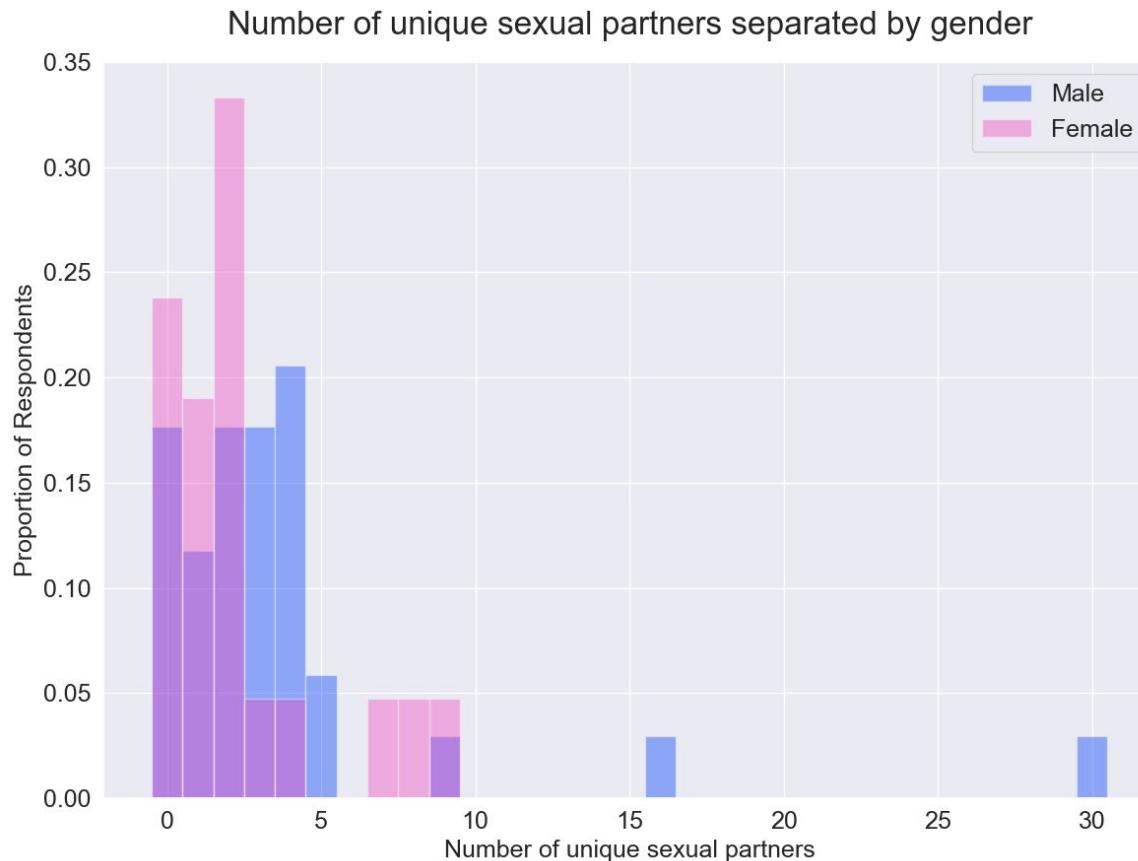


Social & Lifestyle: Sexual partners

How many unique sexual partners have you had in university, if any?



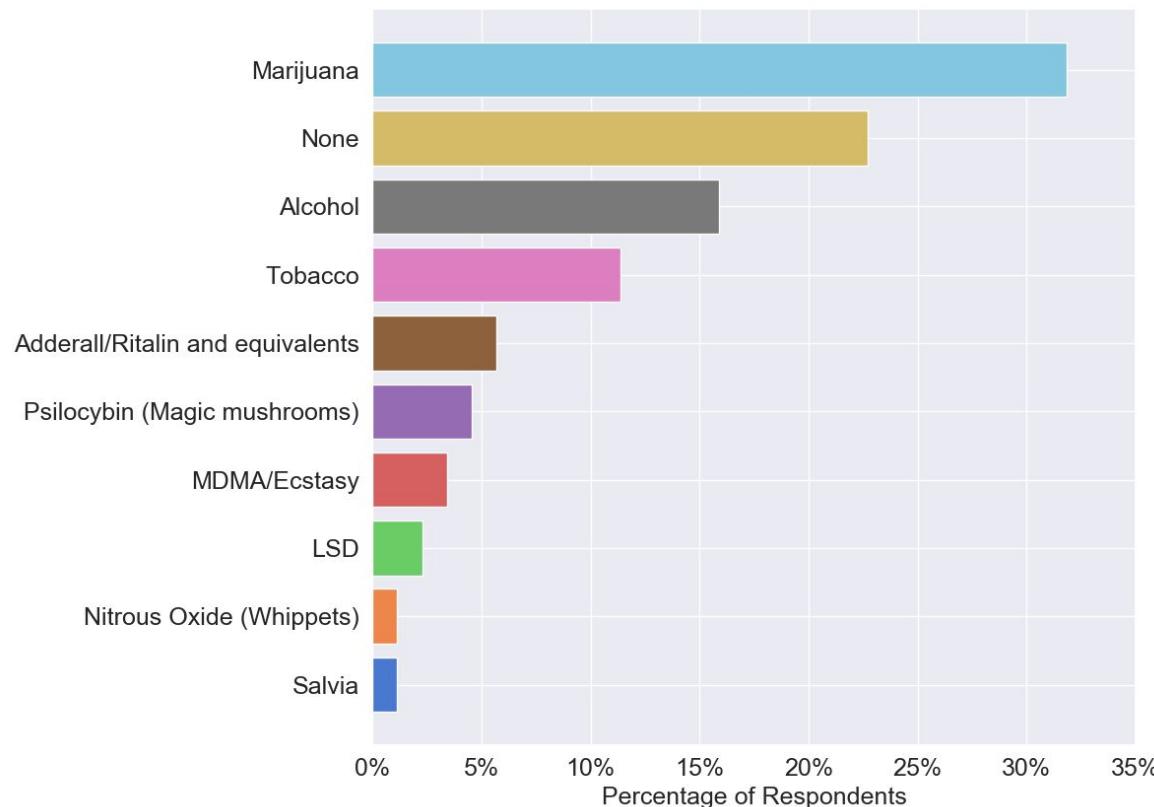
Social & Lifestyle: Sexual partners separated by gender



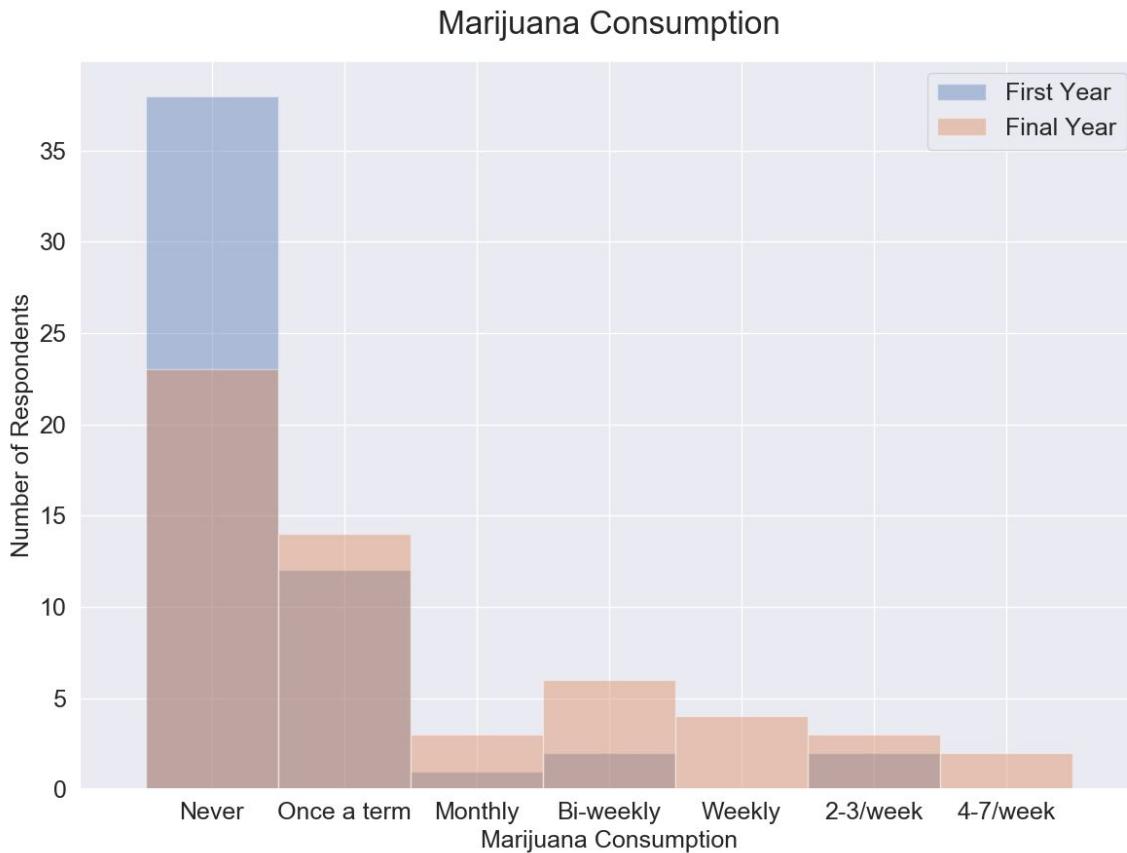
On average, males had 3.74 sexual partners throughout university while females had 2.33 sexual partners.

Social & Lifestyle: Recreational drugs

Which recreational drugs did you try for the first time?

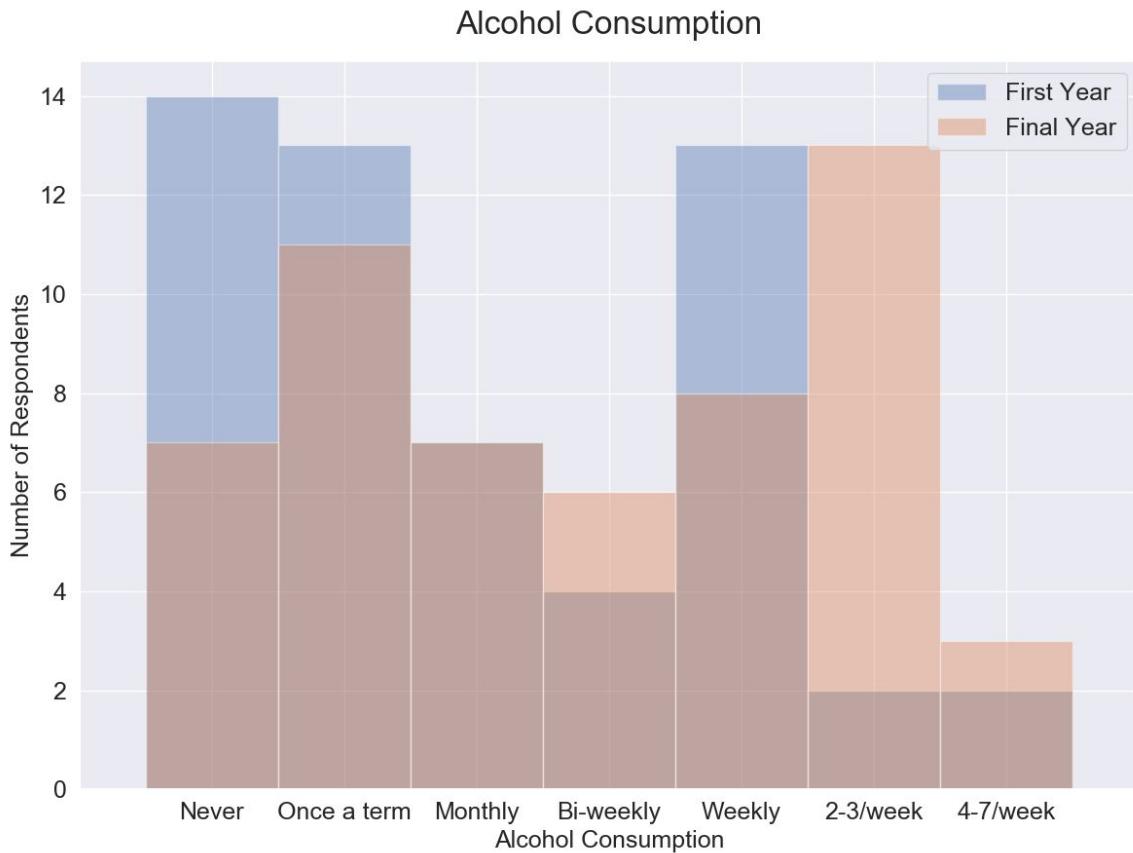


Social & Lifestyle: Marijuana consumption



Marijuana consumption increased
.

Social & Lifestyle: Alcohol consumption



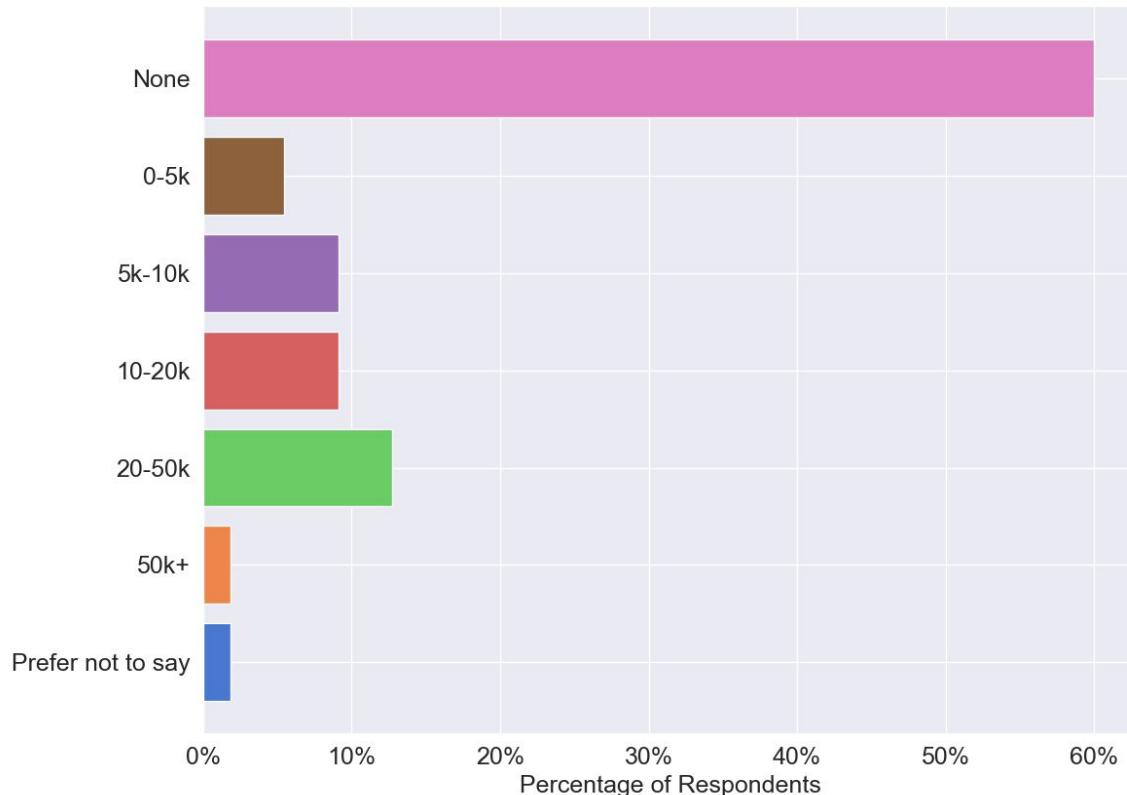
Alcohol consumption increased
[upward trend icon].

The Future

Jobs, Salaries, Brain Drain, Pay Gap, Life Plans

The Future: Debt

How much debt are you graduating with?

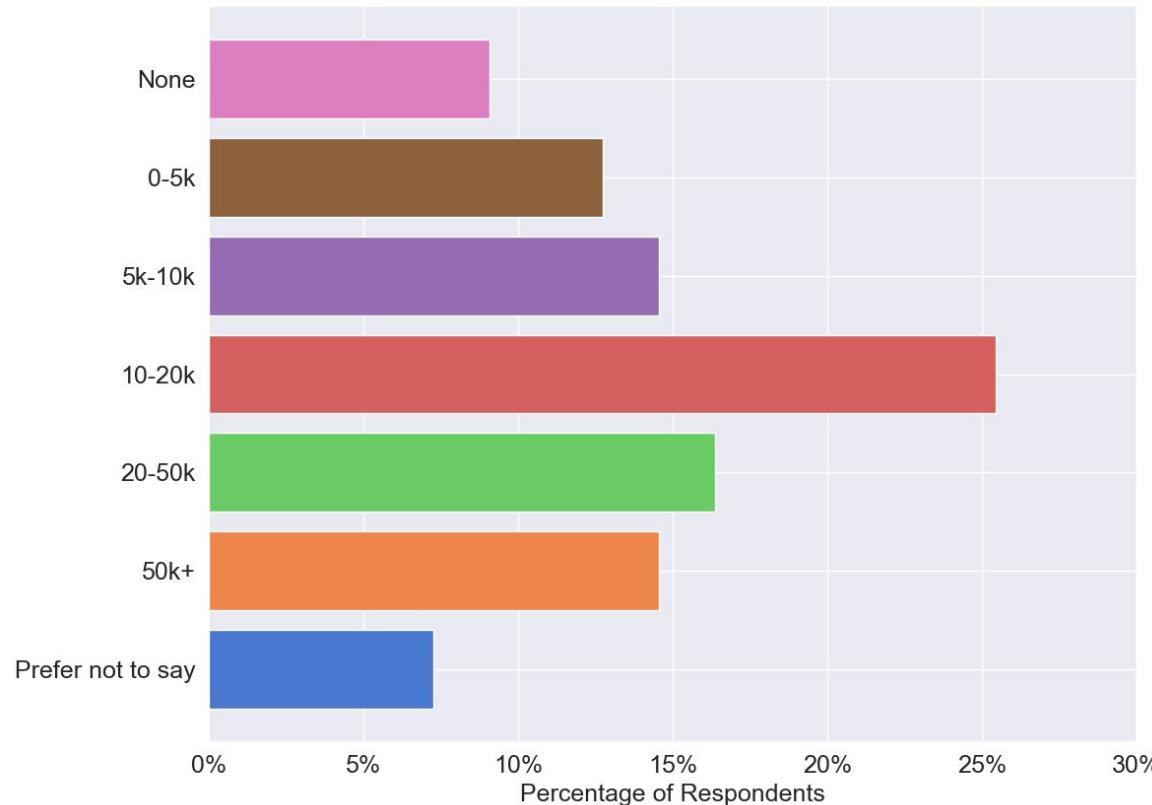


The majority of respondents graduated debt-free! This includes many students whose families funded portions of their education.

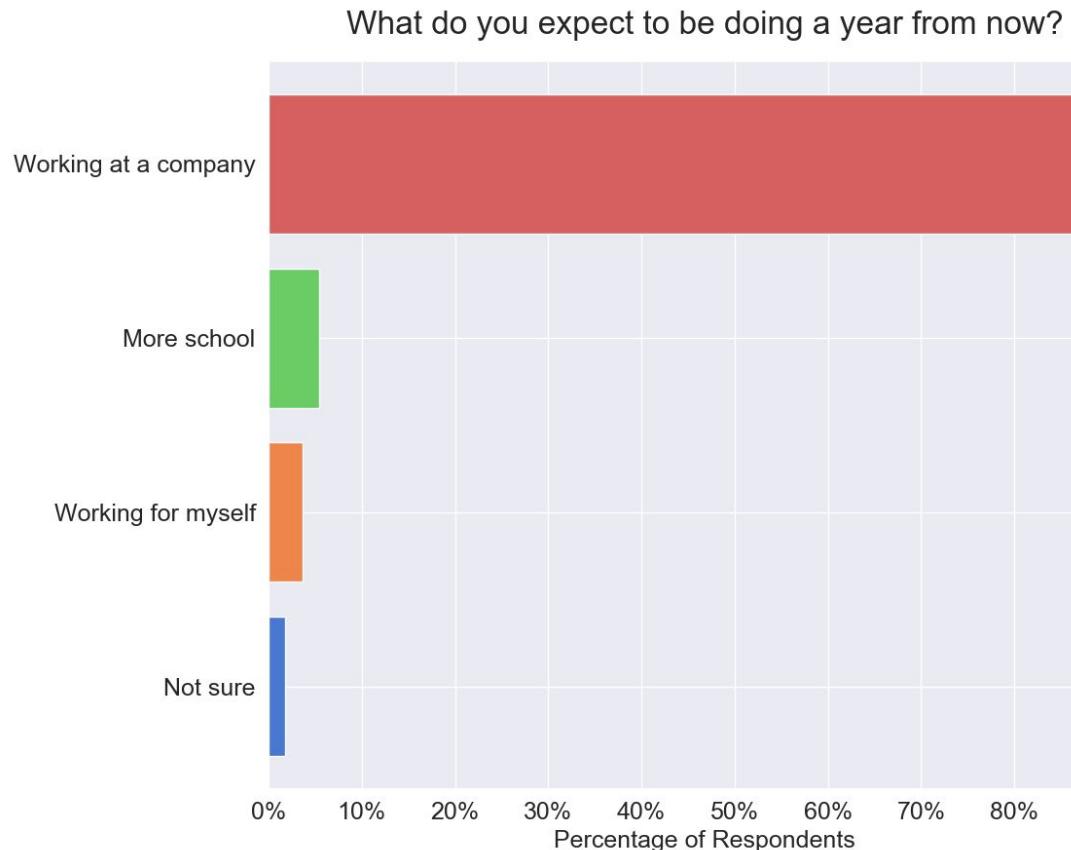
The total cost of tuition was 67,529 CAD. The average total co-op income was 107,532 CAD. For many students, after tax and living costs this income was not enough for them to graduate debt-free.

The Future: Savings

How much do you have in savings?

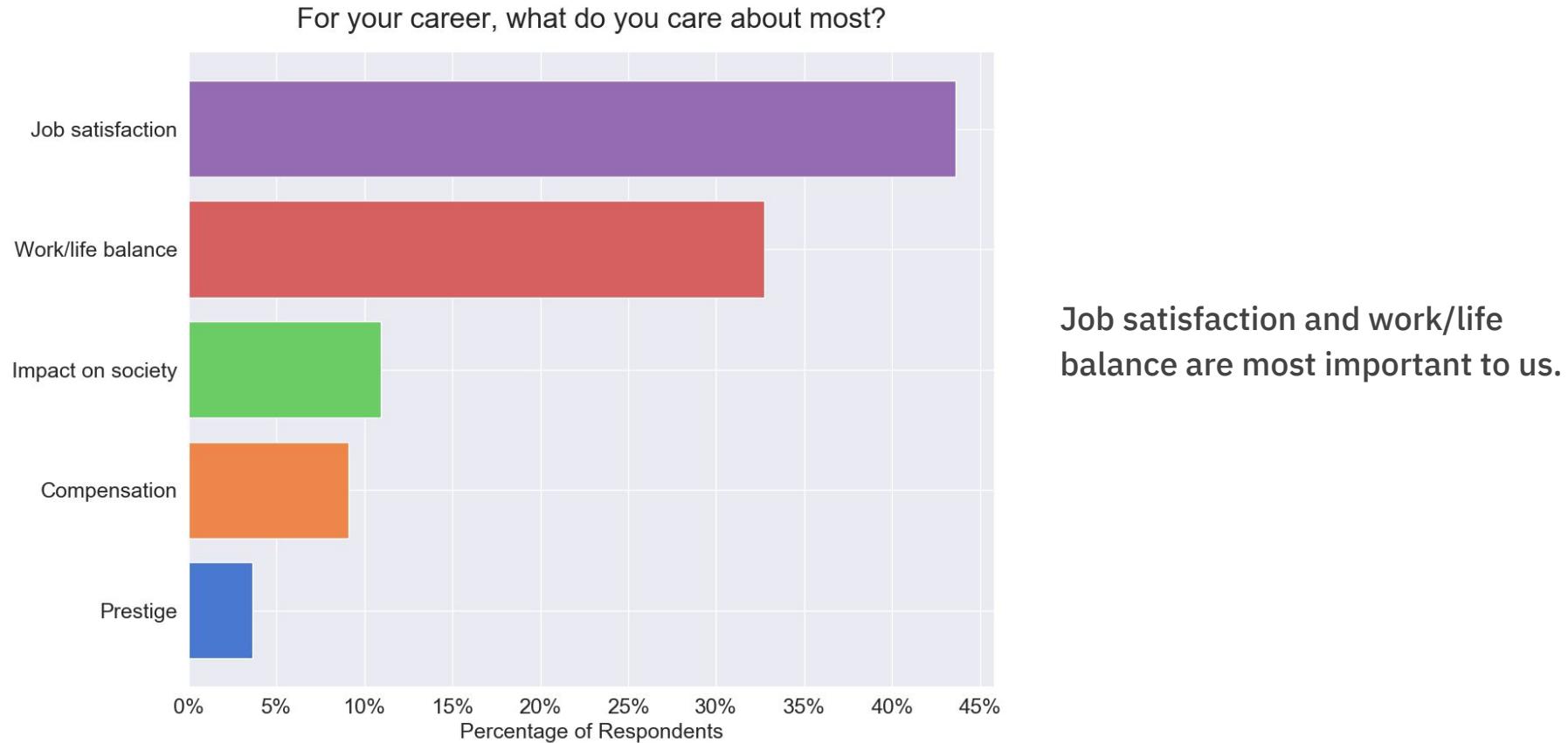


The Future: What will you be doing in a year?

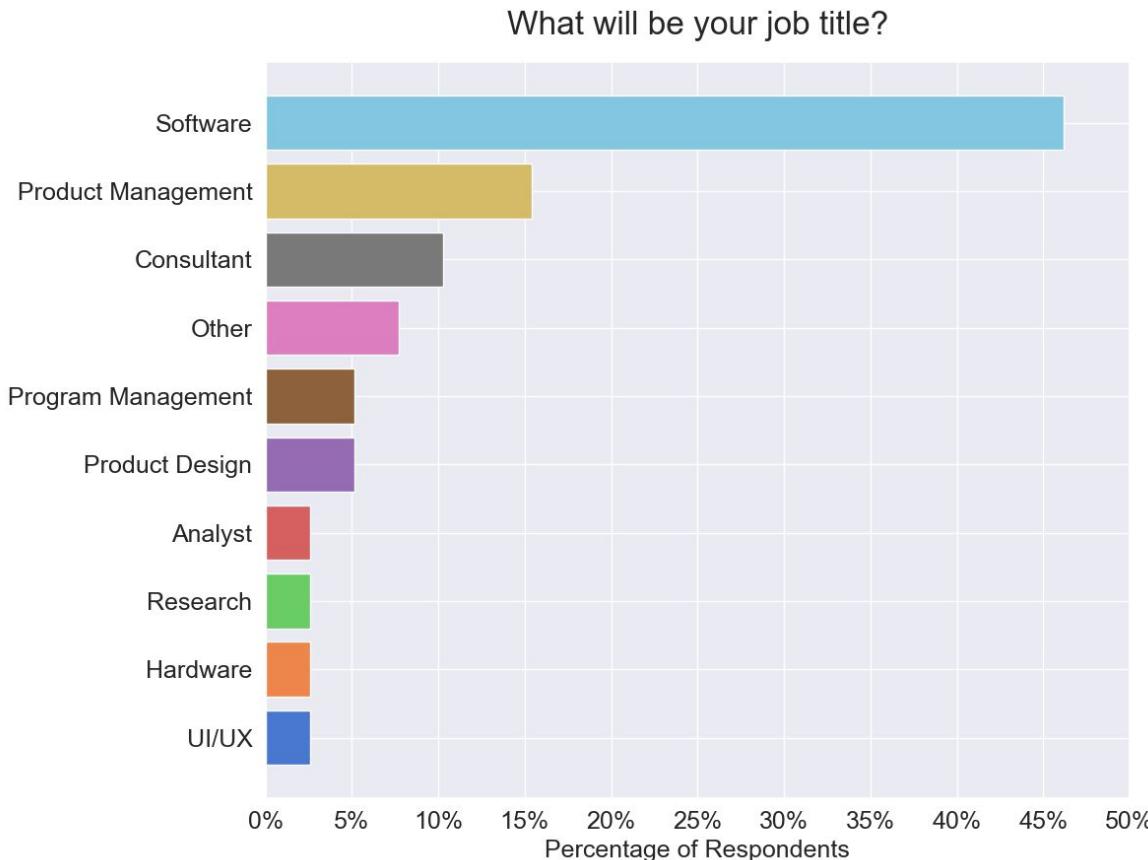


Most of our class planned to be working within a year of graduating.

The Future: For your career, what do you care about most?

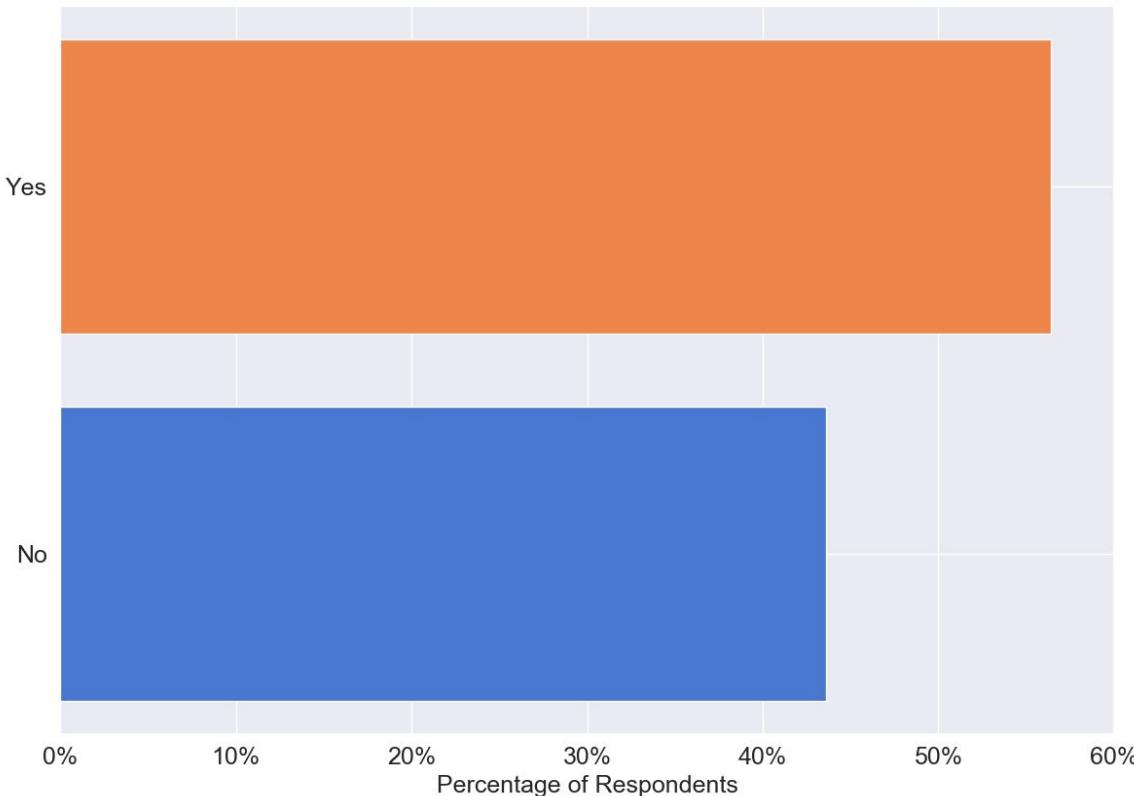


The Future: Job title



The Future: Brain drain

Does your job require you to relocate outside Canada?

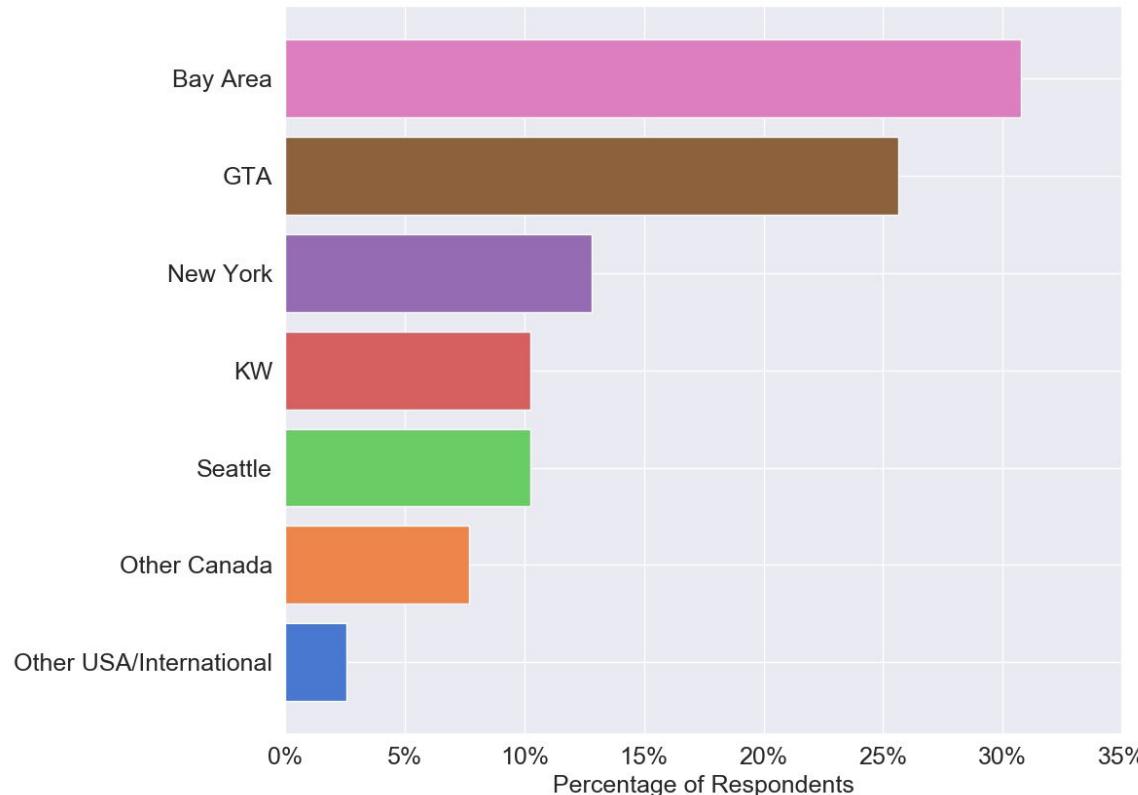


Brain drain is real.

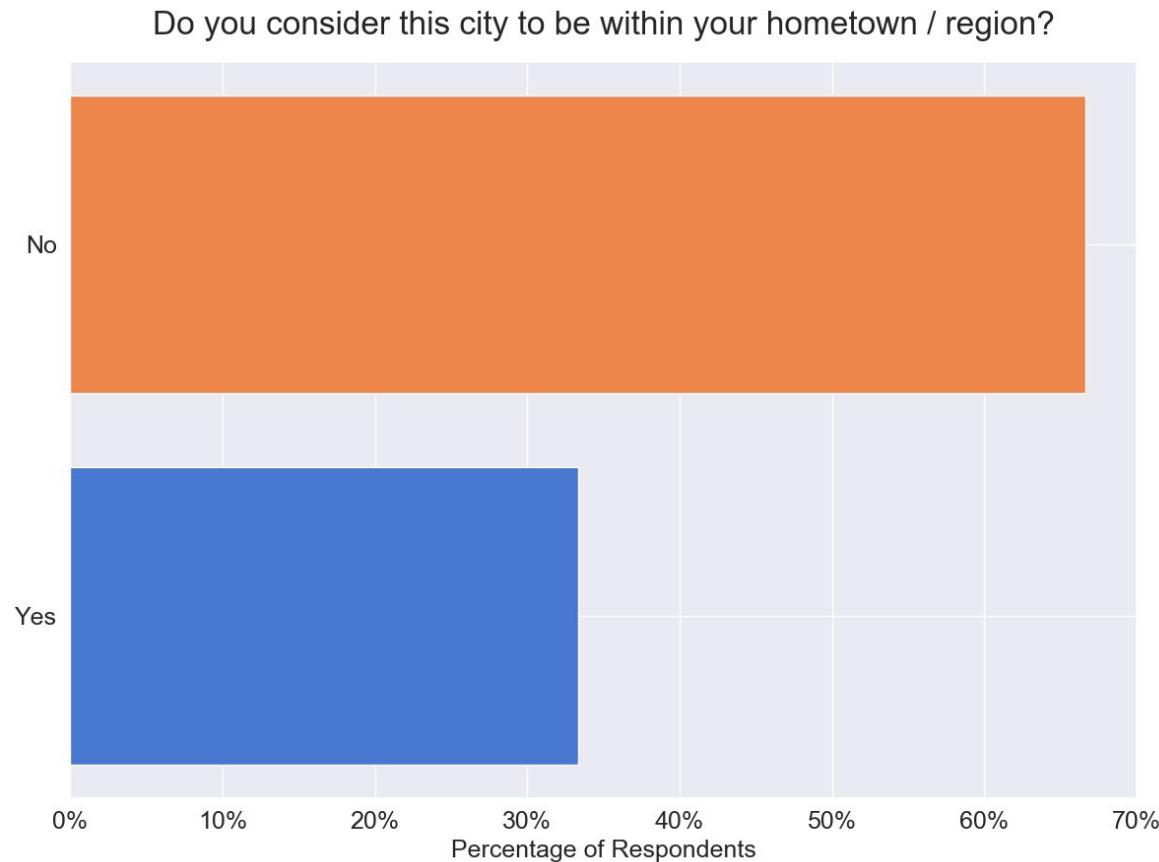
The most cited reason for leaving Canada was opportunities and pay, followed closely by a desire to explore and have new experiences.

The Future: Location

What city will you be working in?

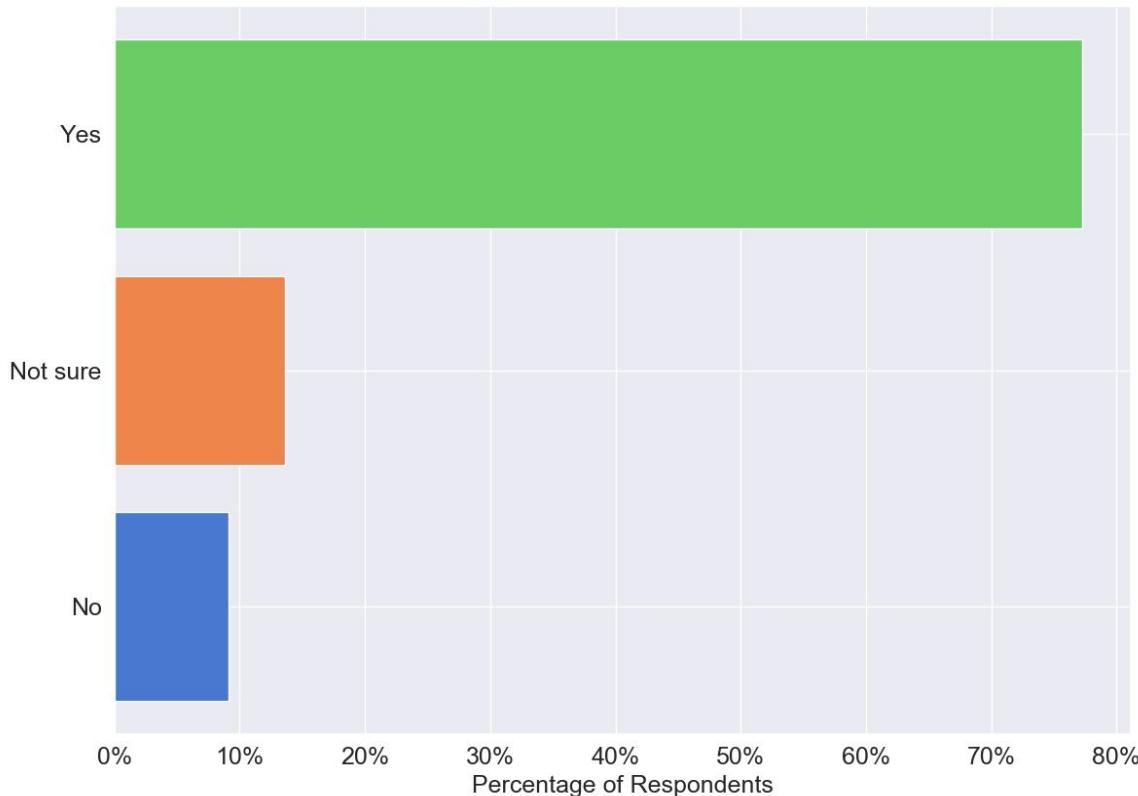


The Future: Do you consider this city to be within your hometown/region?



The Future: Brain gain

Of those leaving, do you plan to come back to Canada?

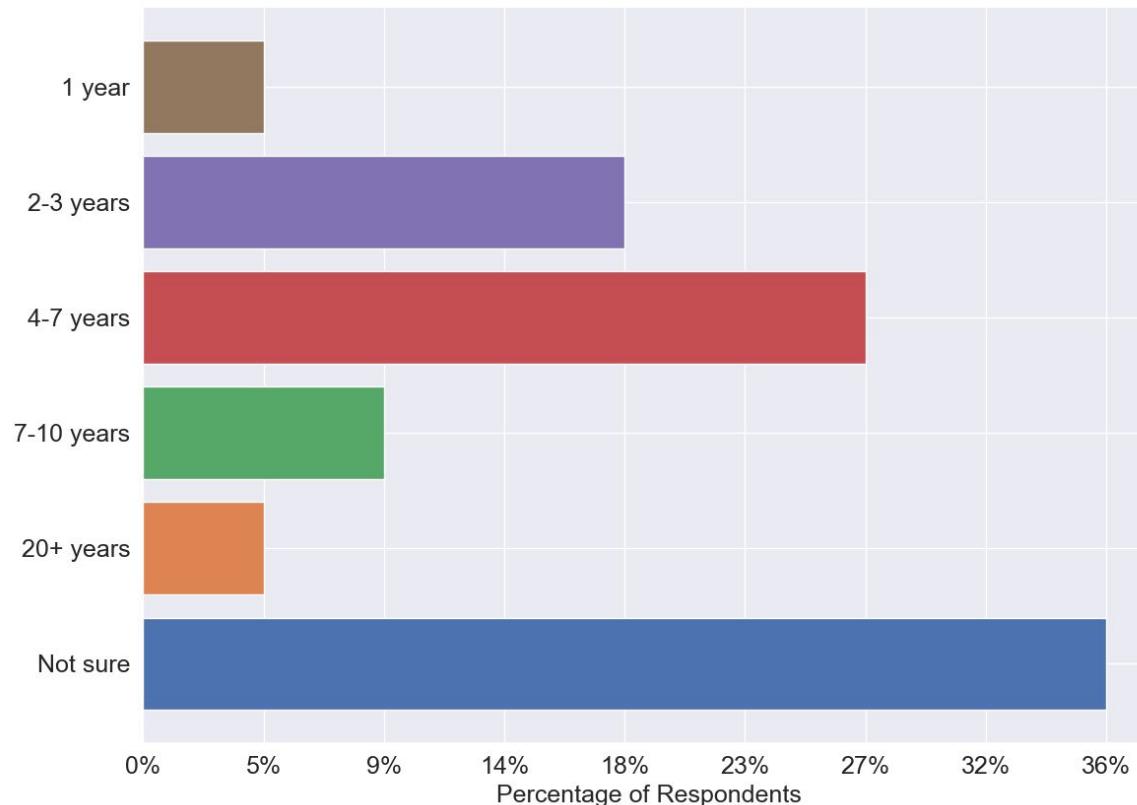


Ô Canada!
Terre de nos aïeux

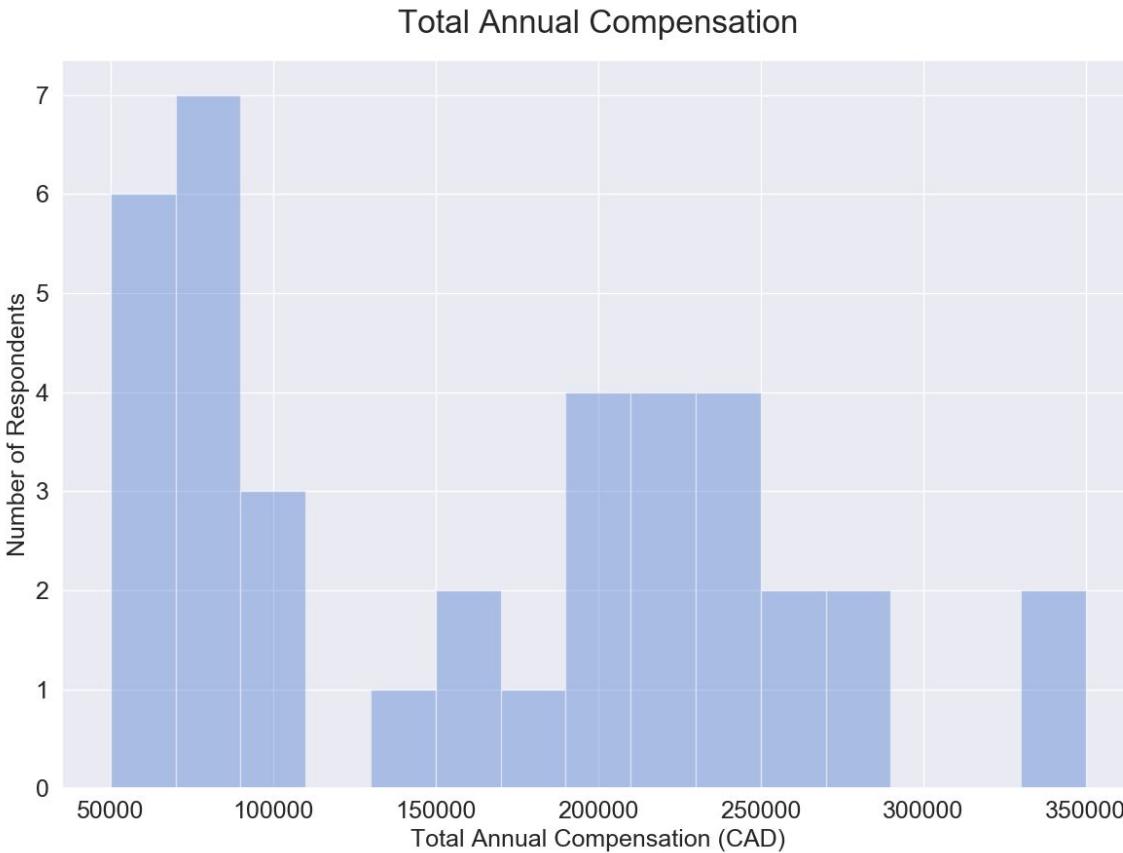
For those that plan to return to Canada, the almost universally cited reason was existing family and other relationship ties.

The Future: If you are leaving Canada, when will you return?

When do you plan to return?



The Future: Compensation

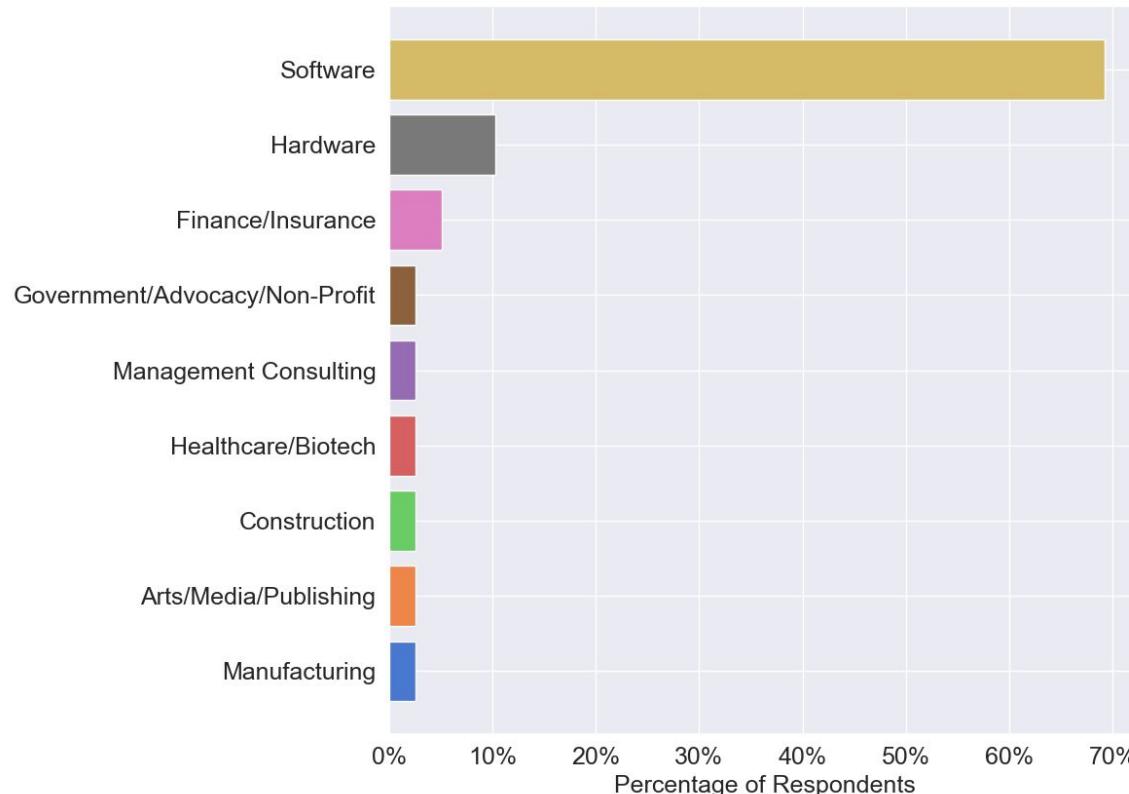


For those who already have jobs, the average total compensation in the first year is 173,387.08 CAD. This figure includes salary, signing bonus, equity, all other forms of compensation.

Note that of the respondents, 56% are moving to the United States for their full-time position. This helps to account for the wide range of compensation.

The Future: Industry

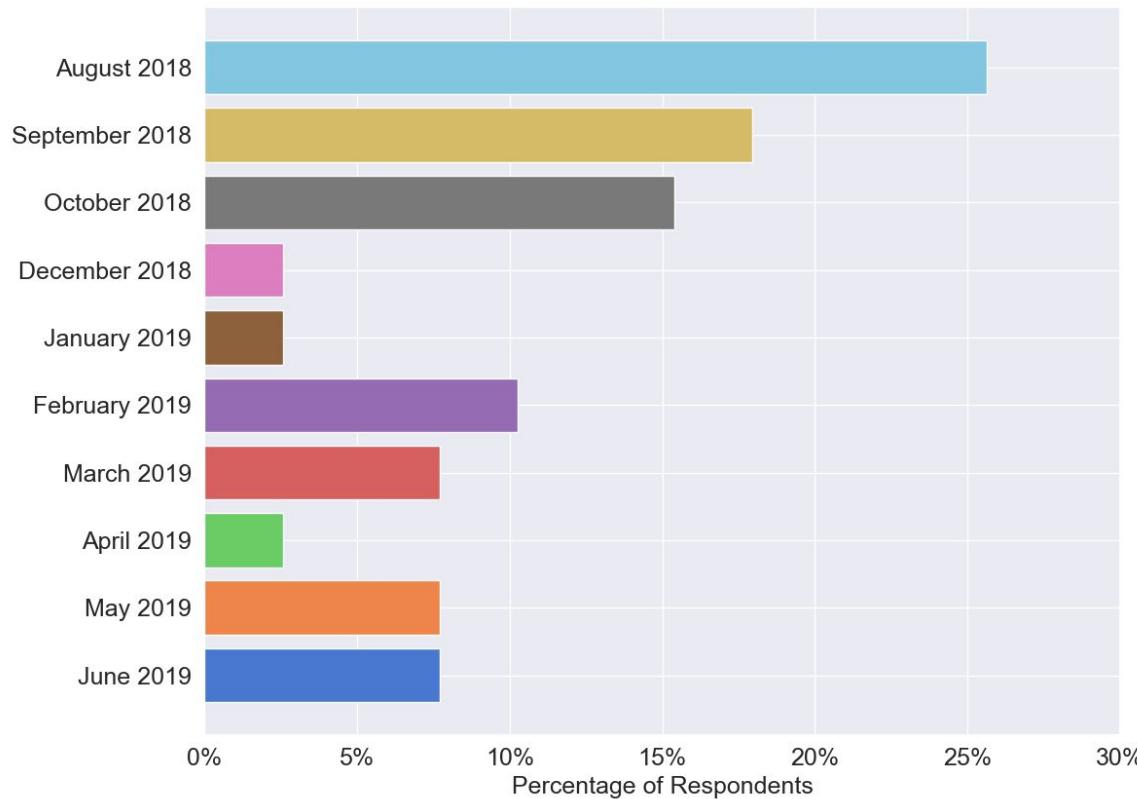
Which industry best describes your next company?



This is quite different from the industries we were interested in before university.

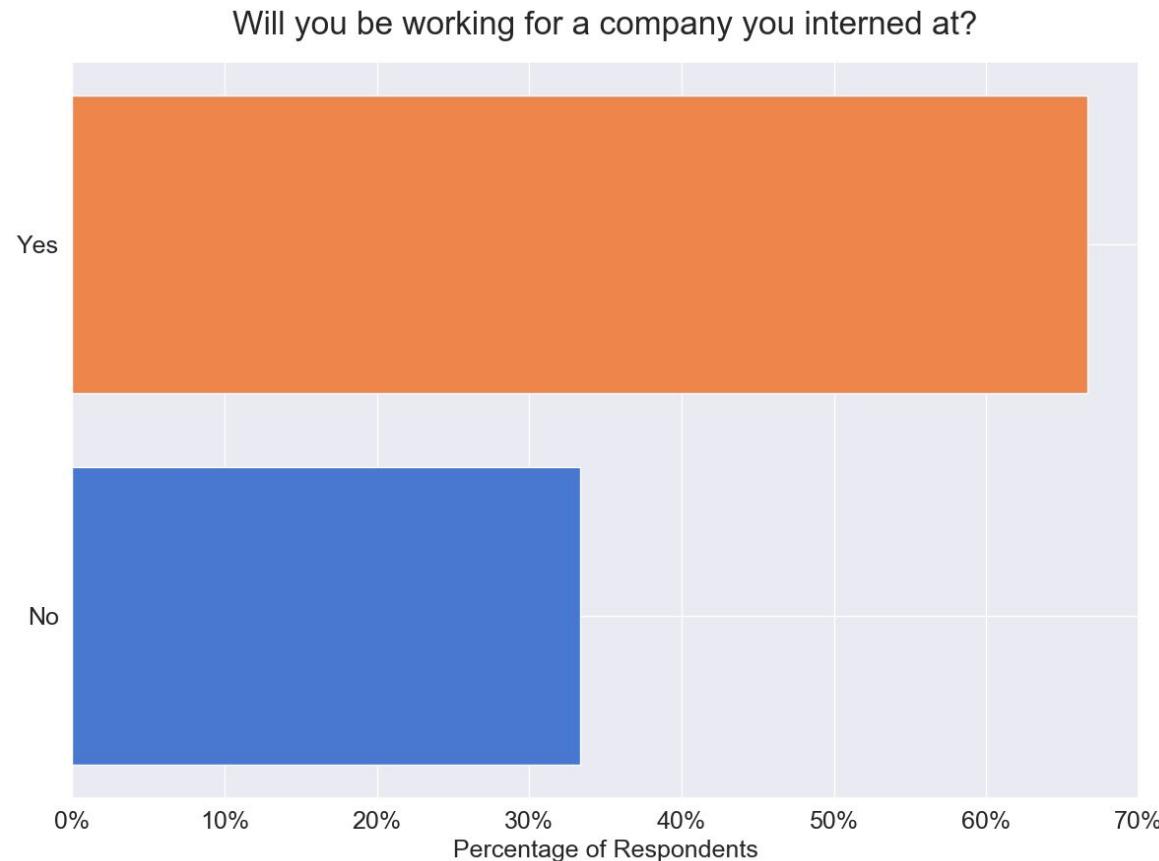
The Future: Job offer date

When did you receive the job offer?



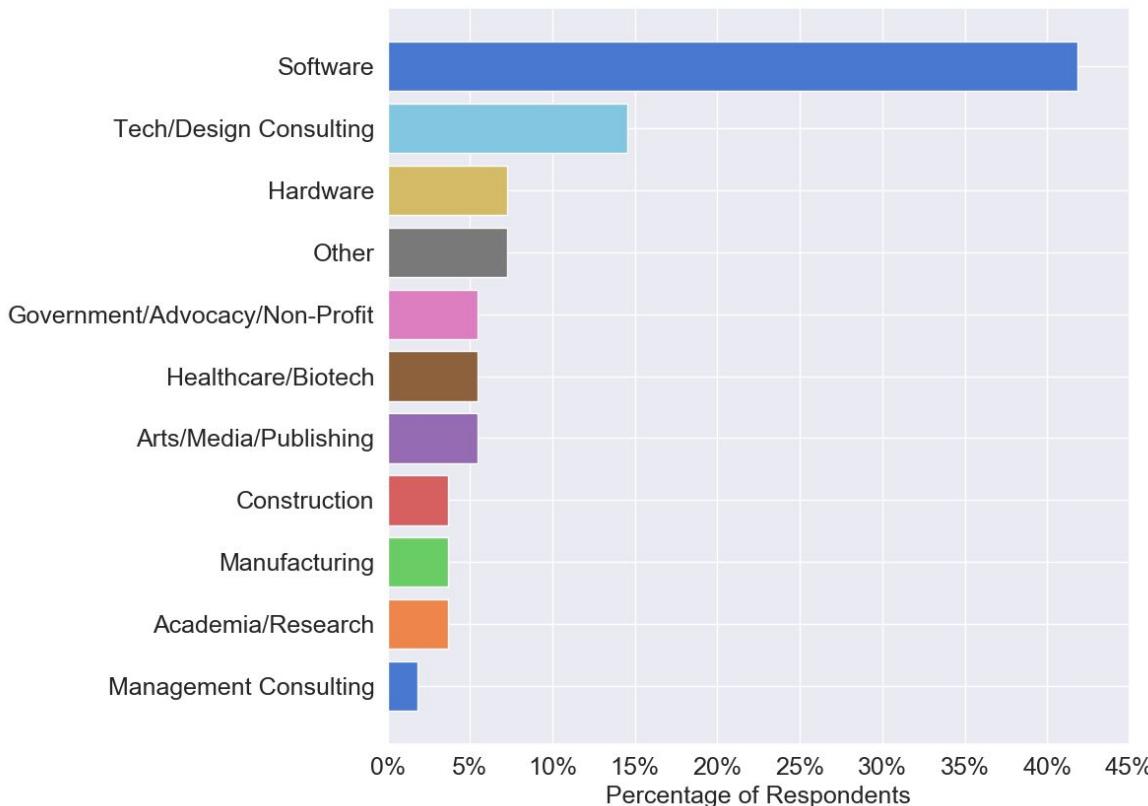
August to October lines up with the standard new graduate recruiting timeline.

The Future: Working for a previous company?



The Future: Industry in 10 years

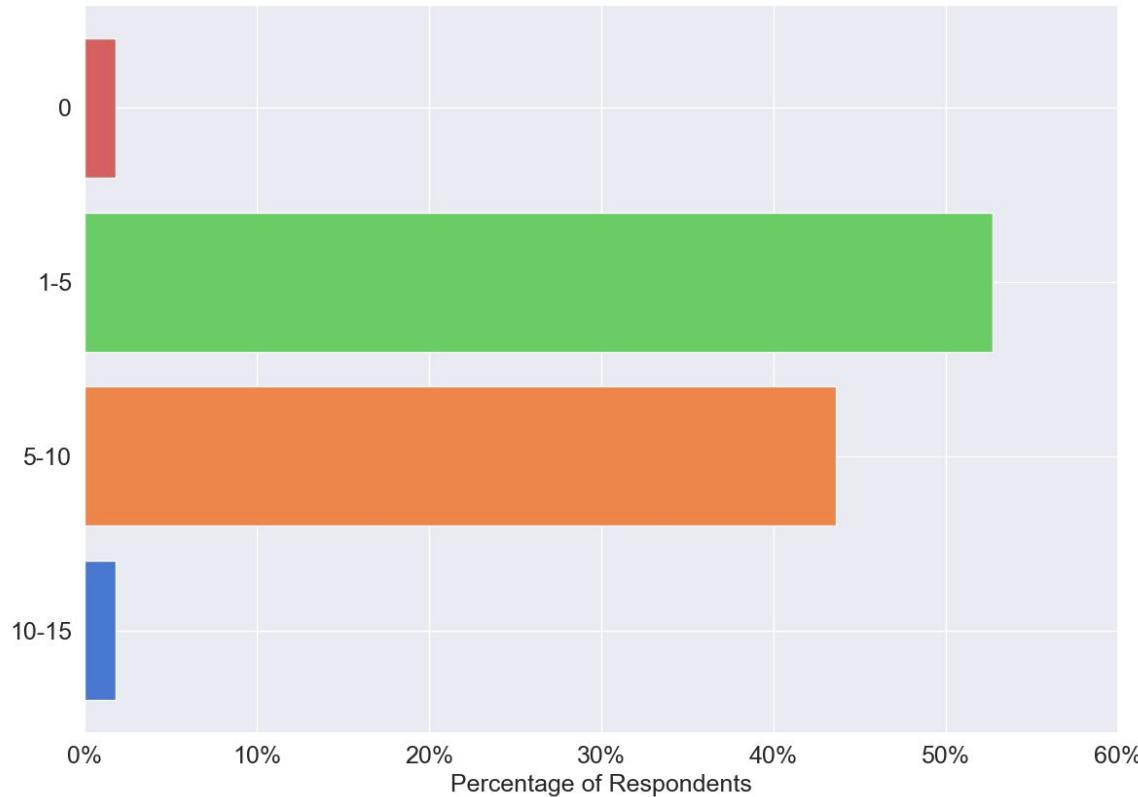
In 10 years, which industry do you hope to work in?



Our interests skew much more towards the software industry than when we began university.

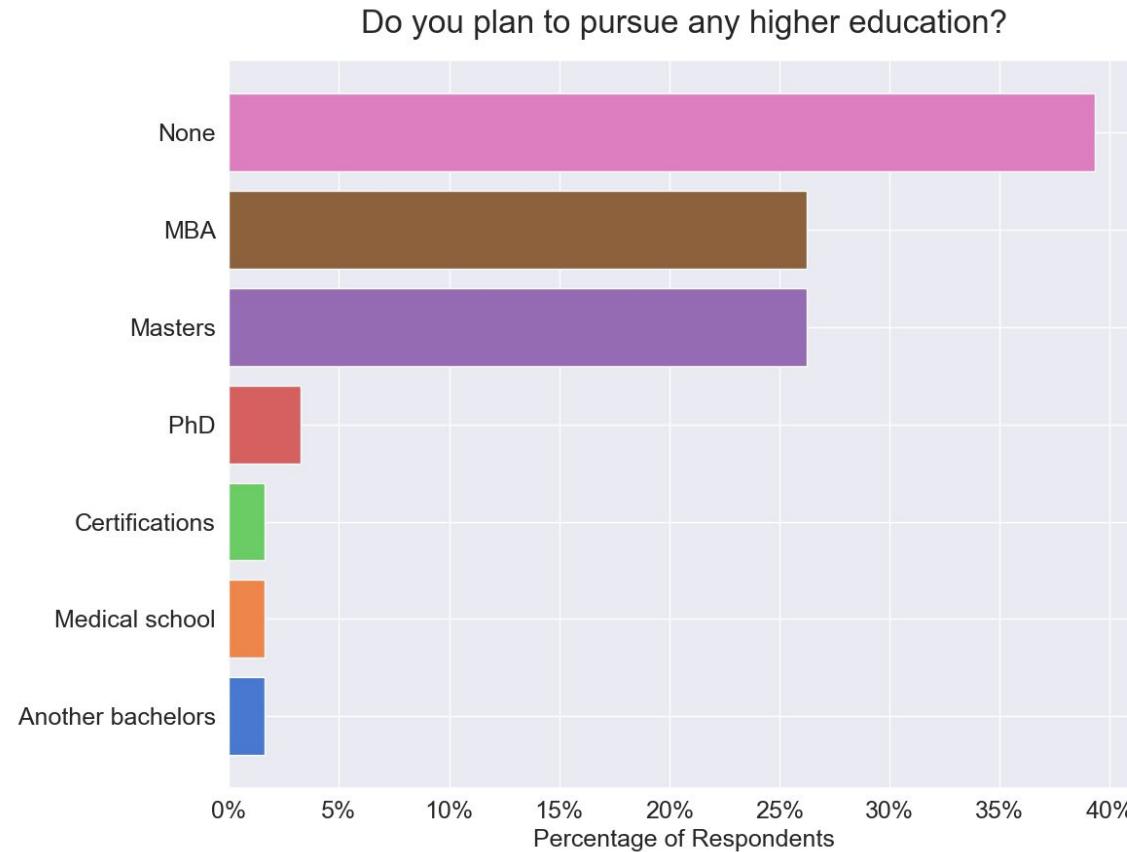
The Future: In 10 years, how many 2019 SYDEs will you be in touch with?

In 10 years, how many 2019 SYDEs will you be in touch with?



BFFs.

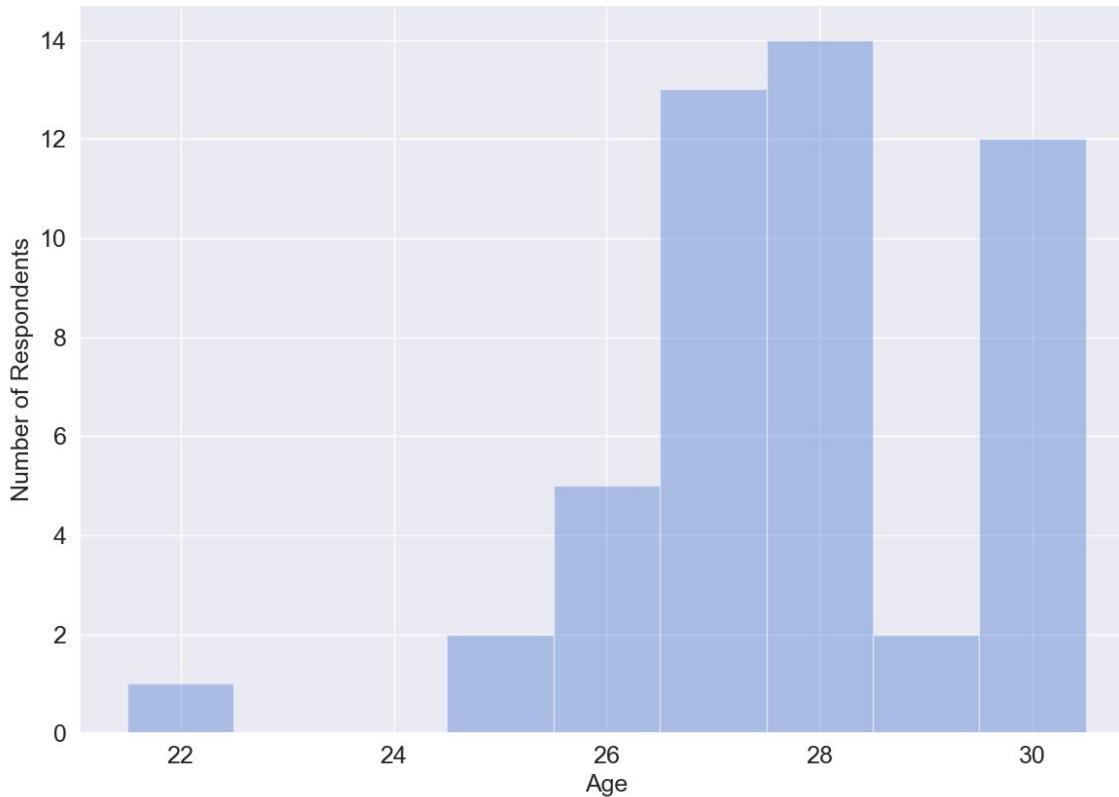
The Future: Do you plan to pursue any higher education?



The majority of respondents want to pursue further education.

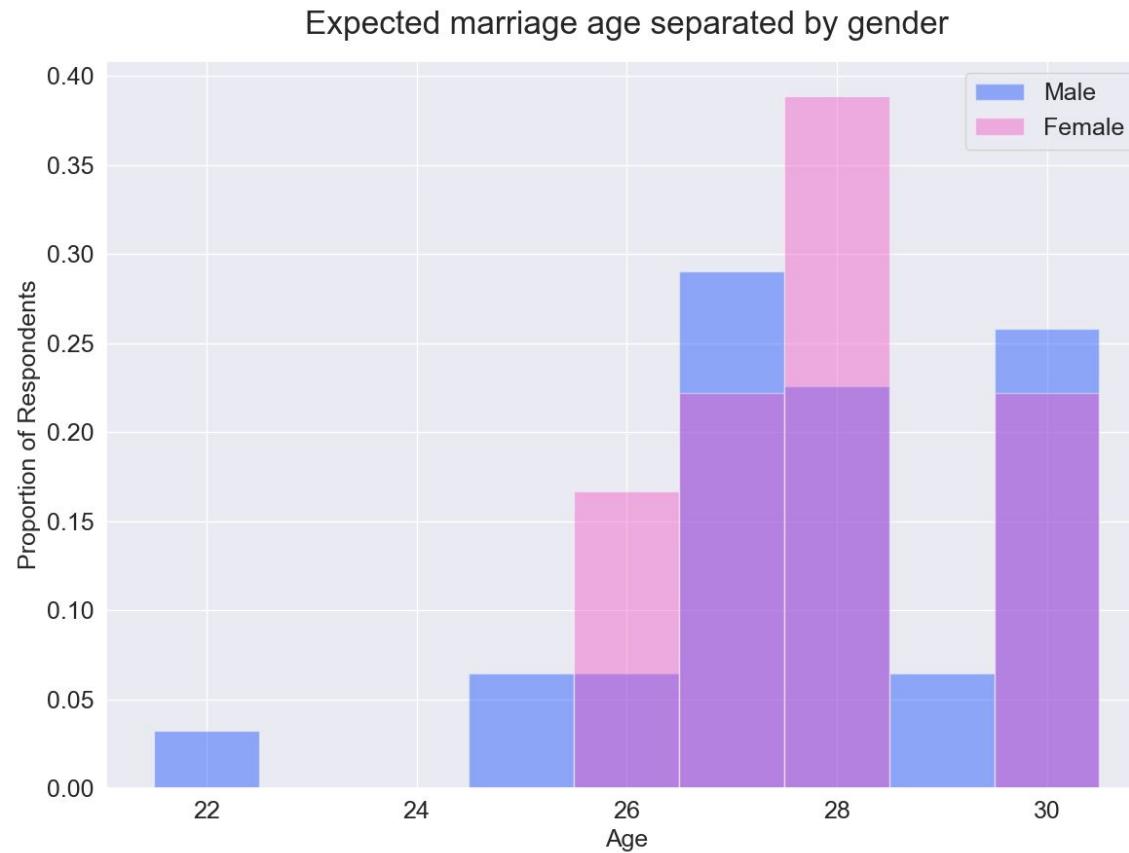
The Future: Age for marriage

If you intend to get married, at what age do you expect to do so?



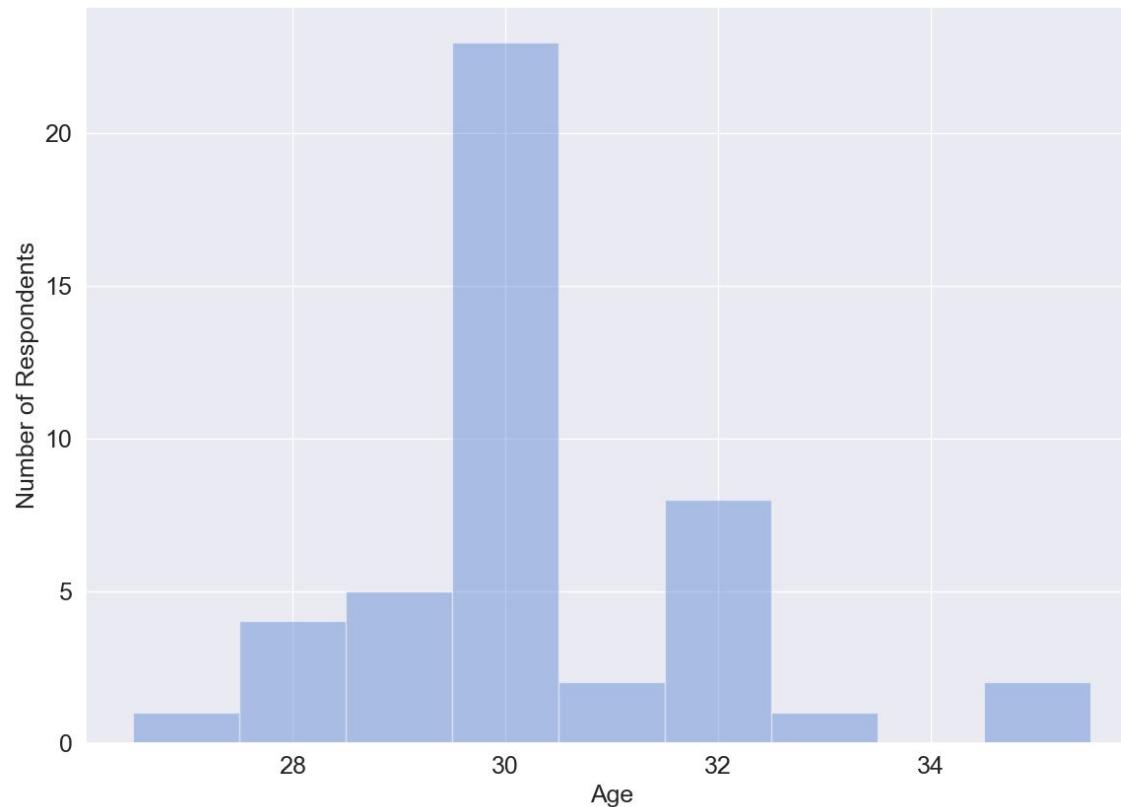
Nobody likes you when you're 23
(or 24).

The Future: Age for marriage separated by gender

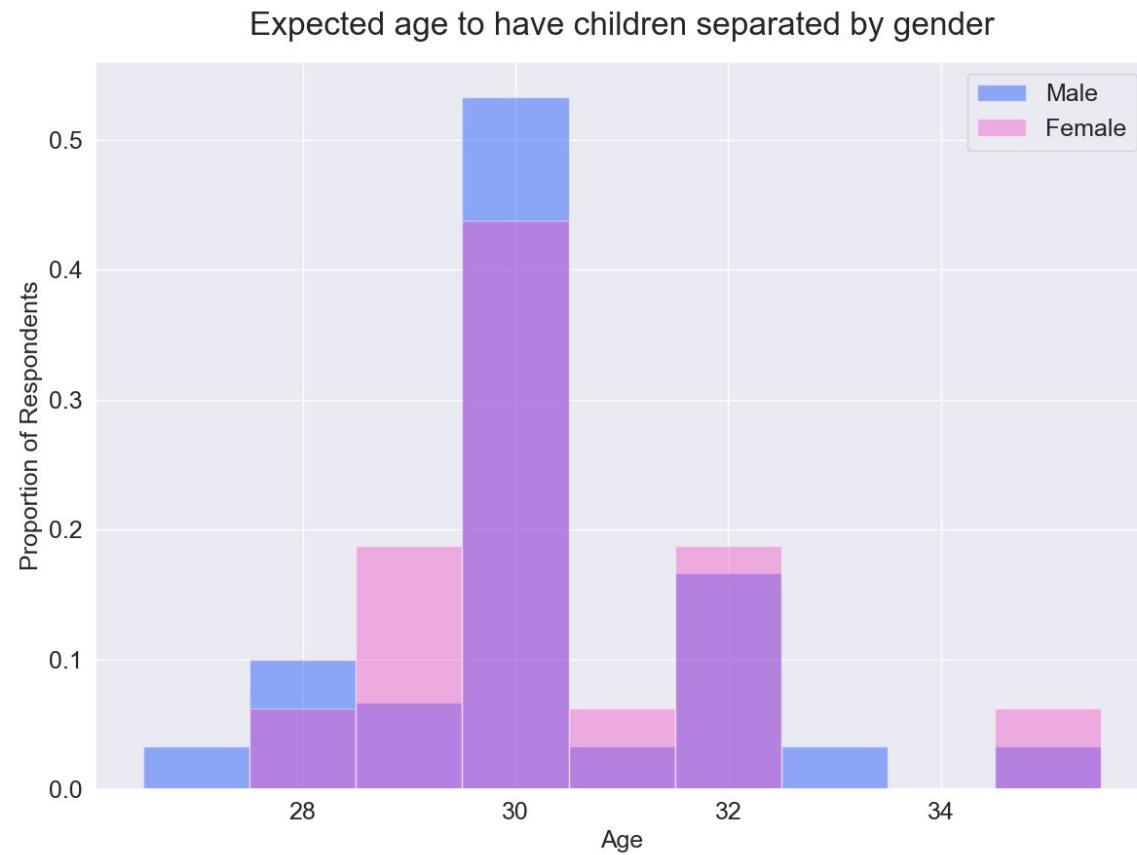


The Future: Age for children

If you intend to have children, at what age do you expect to do so?

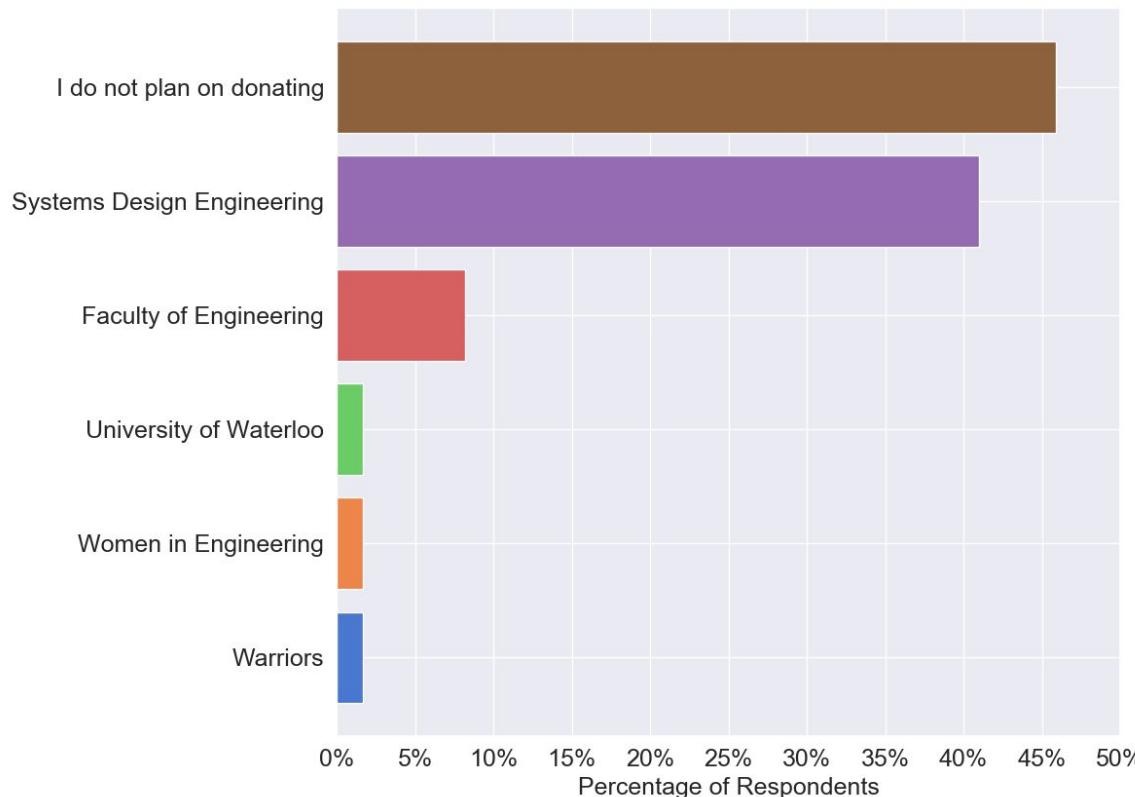


The Future: Age for children separated by gender



The Future: Alumni donations

Which do you plan on donating to as an alumni?



The majority of the respondents plan on making alumni donations in some capacity.

Closing Remarks

Thank you for your time!

Shoutouts

Joey Loi and Atef Chaudhury for creating the original [Systems Design Engineering 2017 Class Profile](#).

&

Krishn Ramesh for following up with the [Systems Design Engineering 2018 Class Profile](#).

They've inspired us to continue the SYDE class profile project and hopefully turn this into a new class tradition.

Much of the process and structure of this profile was borrowed from their original resources and iterated upon with their guidance.

Final Thoughts

Thank you for your interest in learning about the Systems Design Engineering class of 2019!

If you are interested in conducting your own class survey, you may find [our repository](#) a helpful starting point.

Have any thoughts or questions about the profile? Let us know what's on your mind:

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