# MANAGEMENT ENGINEERING 2020 CLASS PROFILE

Compiled by Aaron Yim & Meghan Stronach

#### **FOREWORD**

# WHAT'S MANAGEMENT ENGINEERING?

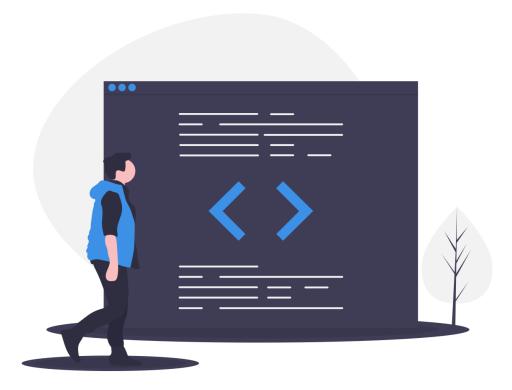
Management Engineering began as Waterloo's version of an Industrial Engineering program.

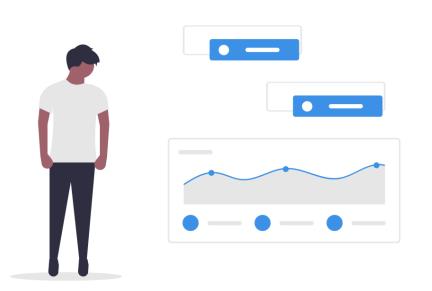
Since then, courses have evolved to focus on bringing problem solving and decision making to any industry. Our courses include operations research, optimization, statistics, software development and design.

#### **COMMON CAREER PATHS**

software development











manufacturing engineering

product management

#### **ANALYST'S NOTES**

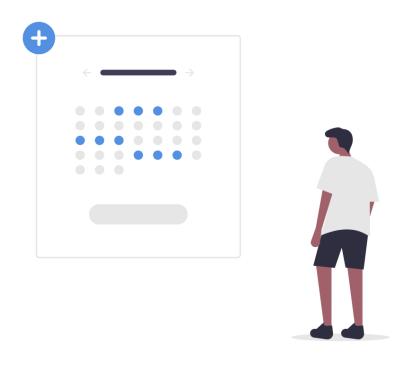
# WHAT DO I NEED TO KNOW?

Our class began with 70 students in IA, 58 of which completed 4B. All classmates were invited to respond to the profile between May I3th - 31st. All questions within the survey were optional and students were free to skip any questions.

All information was collected anonymously and for the purpose of expressing our experiences, not personally identifying any individuals.

#### **SCHOOL**

started Fall 2015



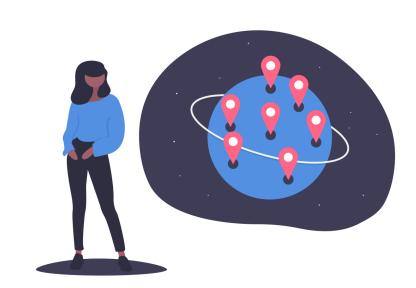
8 months straight for 1A, 1B



CO-OP

exchange rate 1.4 USD: 1 CAD







#### **ANALYST'S NOTES**

survey completion rate

We received 37 responses from 58 classmates. Although survey completion seems low, respondents' term averages are similar when to overall class averages provided by UW. With this, we're confident the profile represents our class.

## Waterloo Median vs. Respondents Median



## Demographics

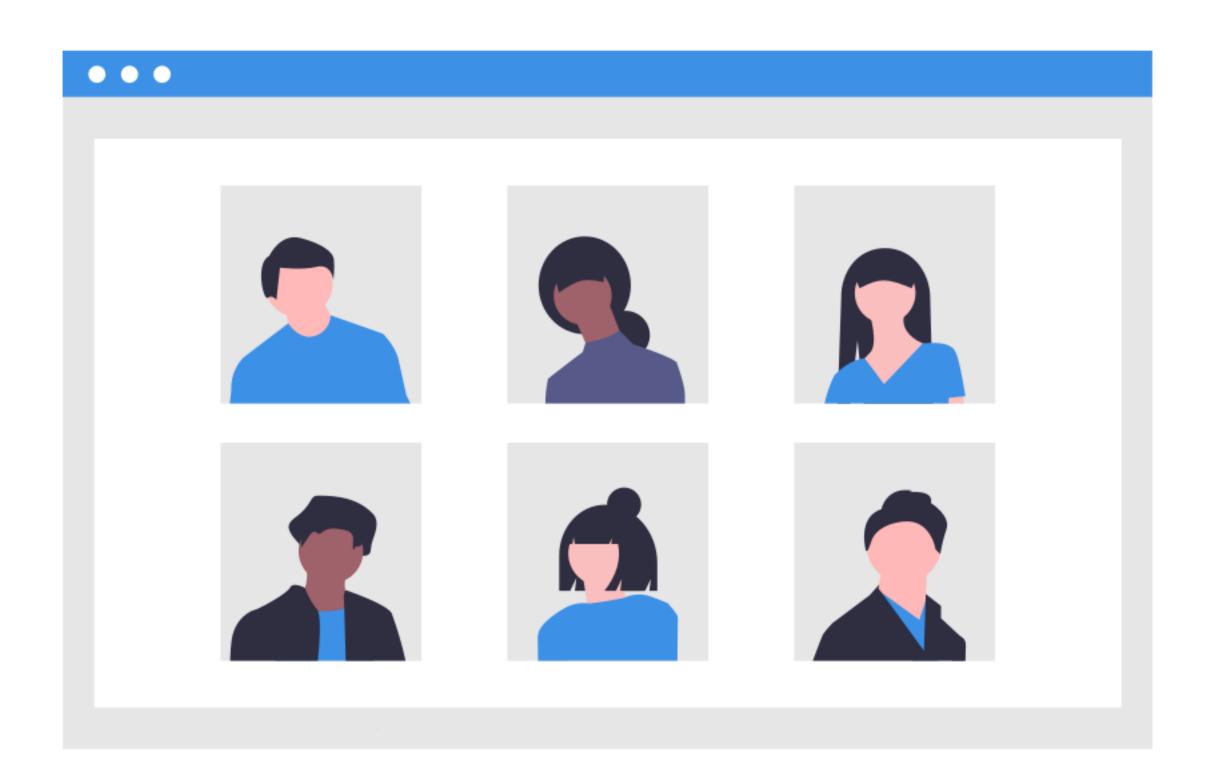
High School

Academics

Social Life at Waterloo

Waterloo Experience: Health

Co-op Experience



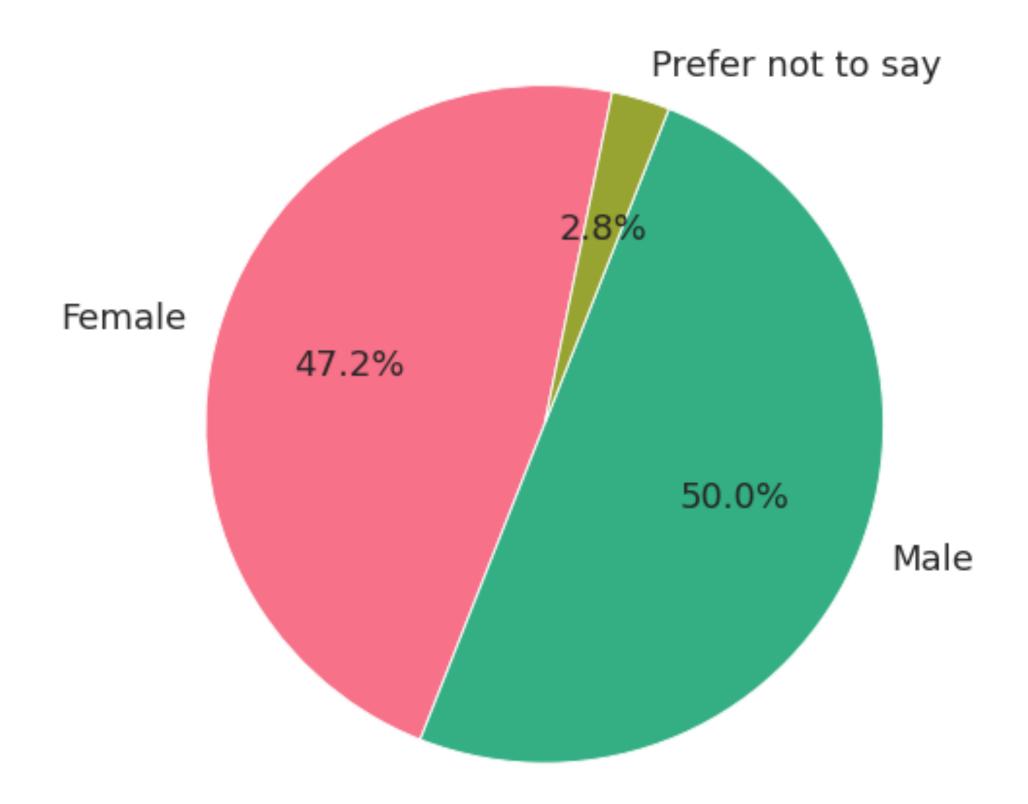


**45%** 

of Management Engineers are female.

Considering the normal gender ratio of engineering cohorts is less females than males, this is pretty equal!!

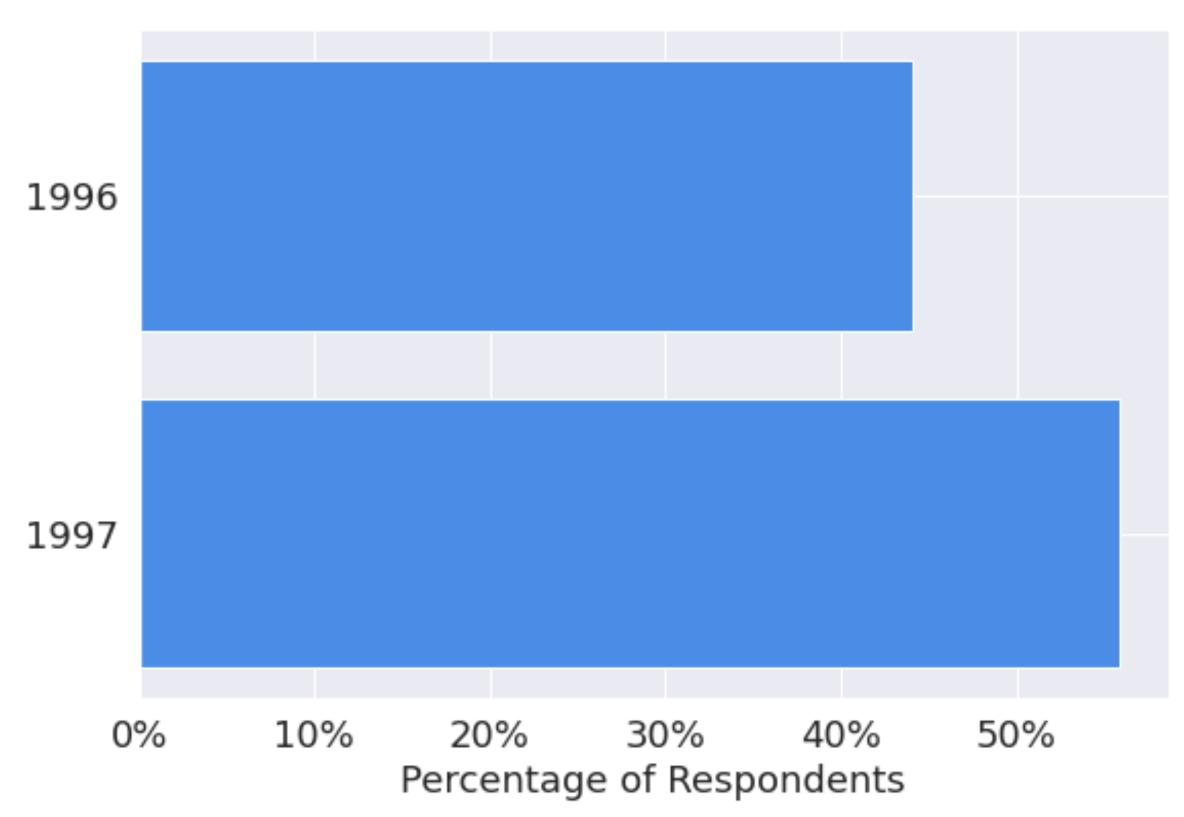
## What gender do you identify with?



of our class was born in 1997

All respondents either came straight to
University after high school, or took an extra
year somewhere along the way.

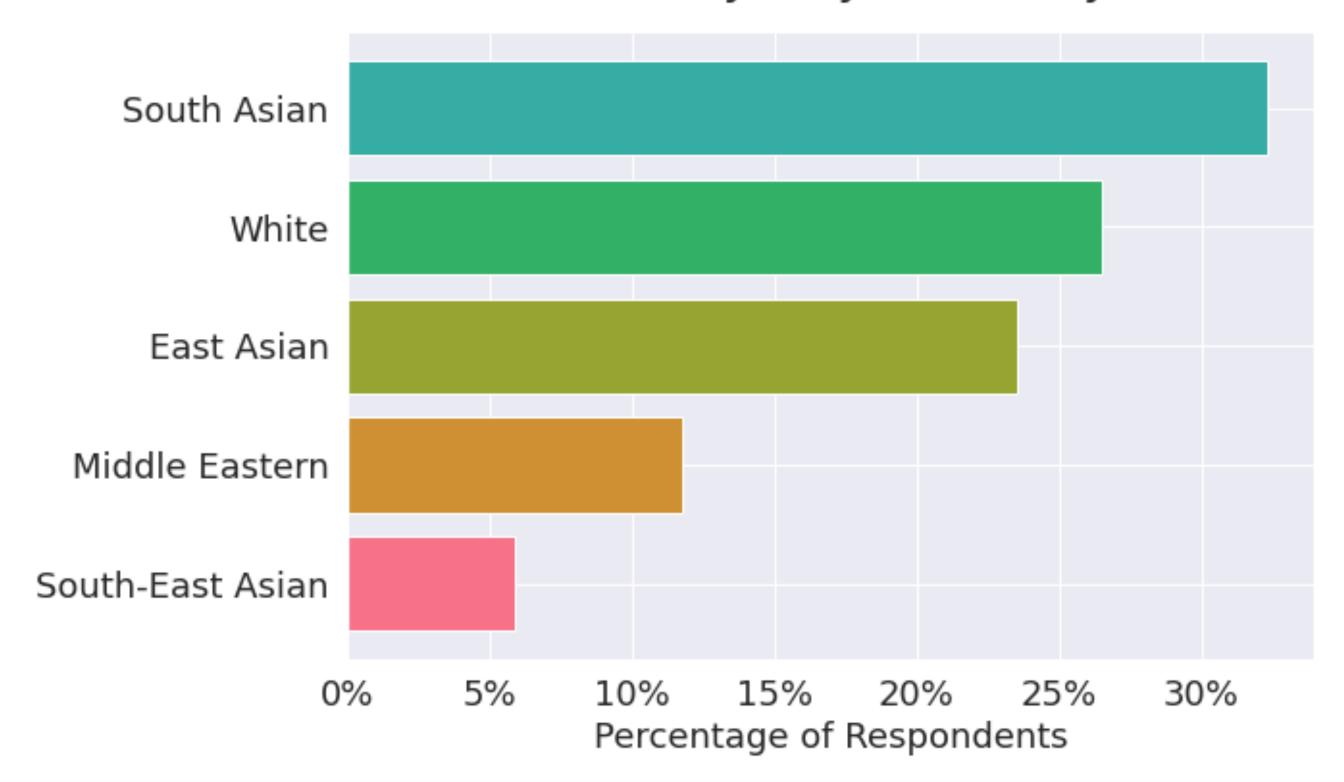
## What year were you born in?



Most ethnic groups were represented, with 32%
South Asian being the largest group

We're a diverse class, with respect to our interests, experiences and as shown here, ethnicities.

## What ethnicity do you identify with?

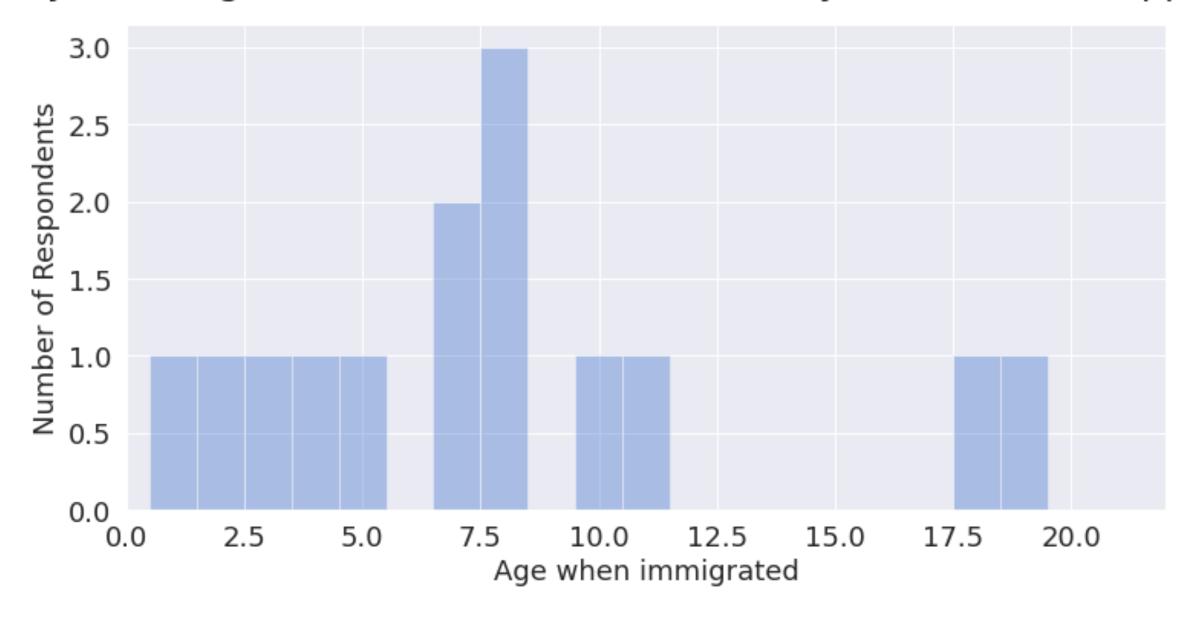


496

of our class immigrated to Canada.

Our classes percentage of immigration is about double the national average with most students immigrating before they were 10 years old.

If you immigrated to Canada, how old were you when that happened

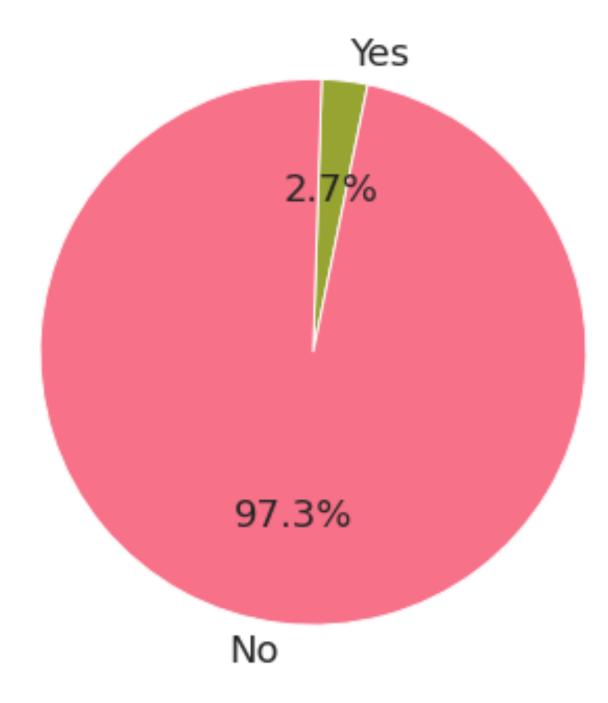


1/36

respondent indicated they were considered an international student.

Most immigrated to Canada before starting university. Good thing because that international tuition would not be fun.

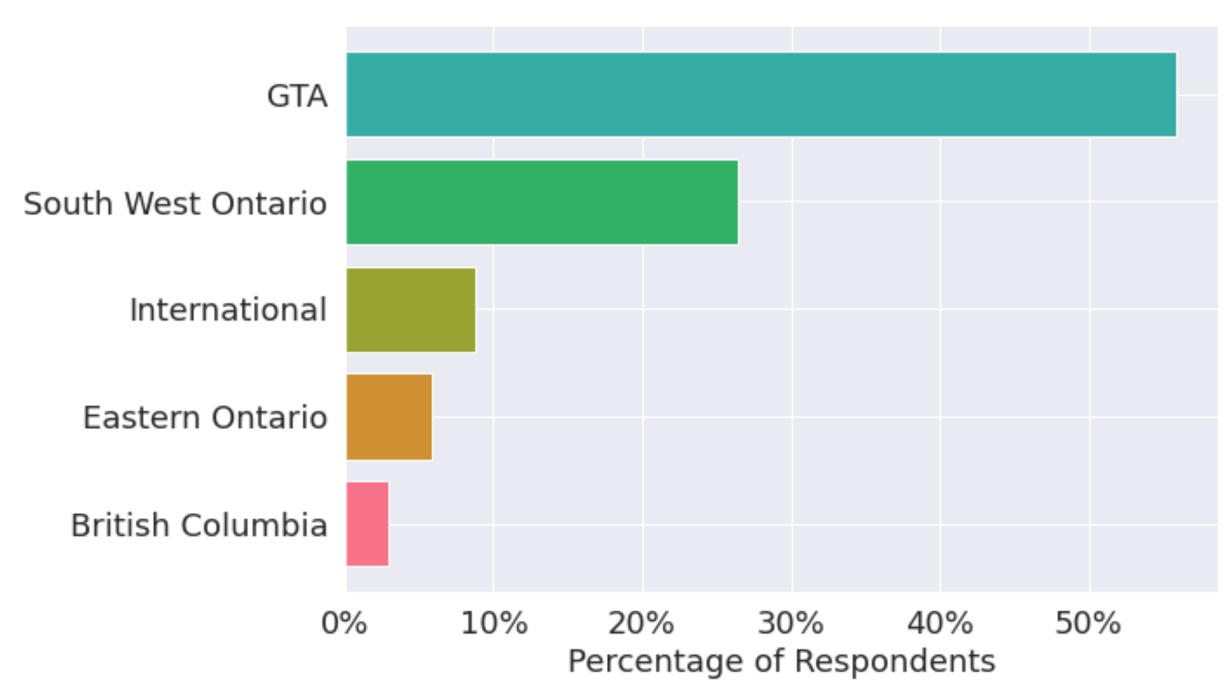
## Are you considered an international student?



called the GTA home growing up.

The rest, for the most part still grew up in Ontario before moving to Waterloo.

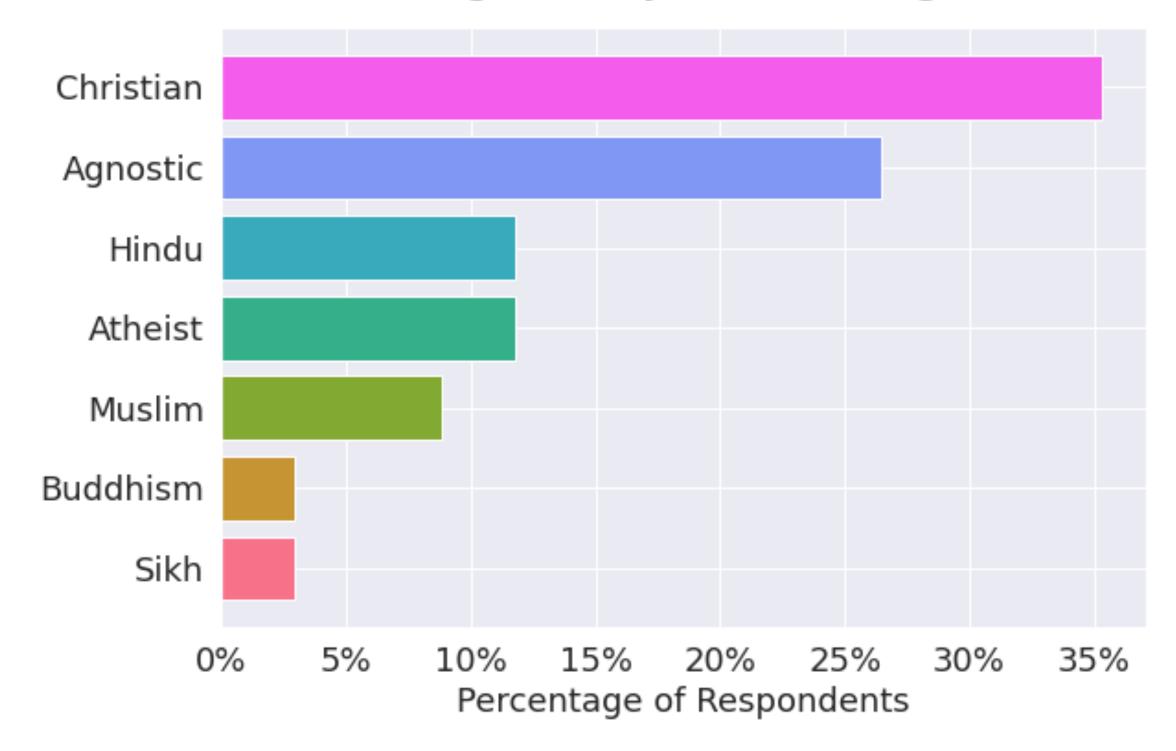
## Where did you grow up?



of our class believes in a specific religion.

Again, we're a very diverse class.

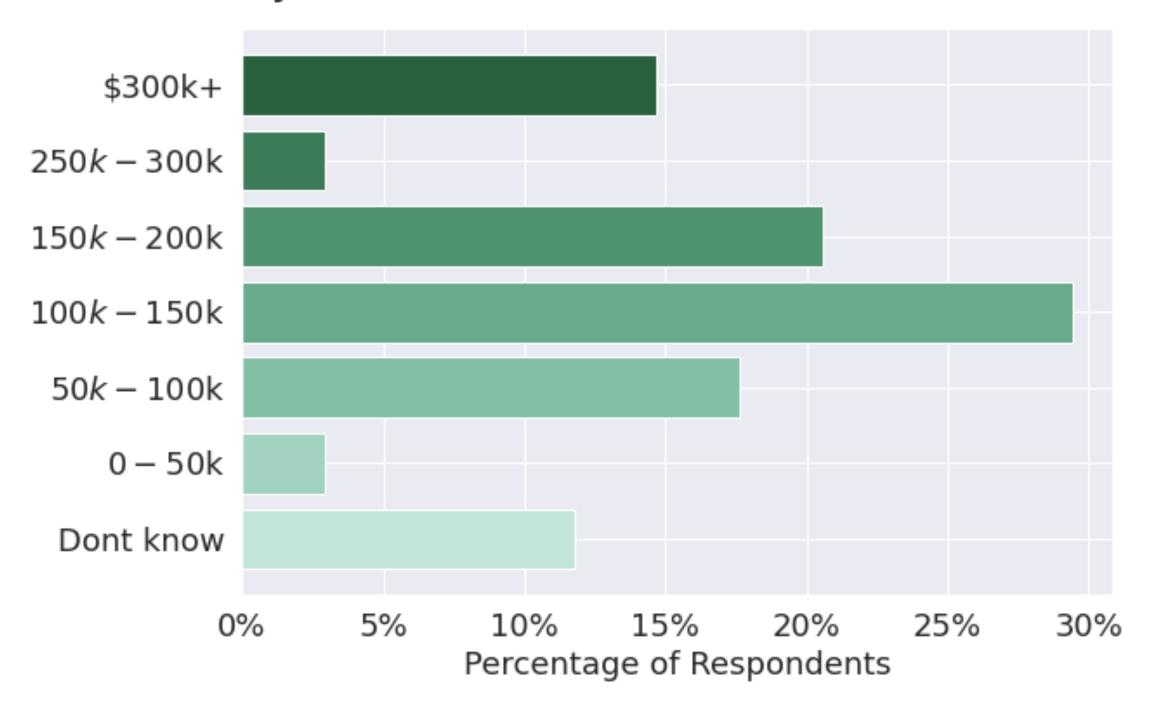
## What religion do you most align with?



The most popular combined income of our parents was \$100k - \$150k, though a lot didn't know.

Our parents income didn't really have a pattern correlating to our earnings, or how much of our education our parents paid for, everyone was different.

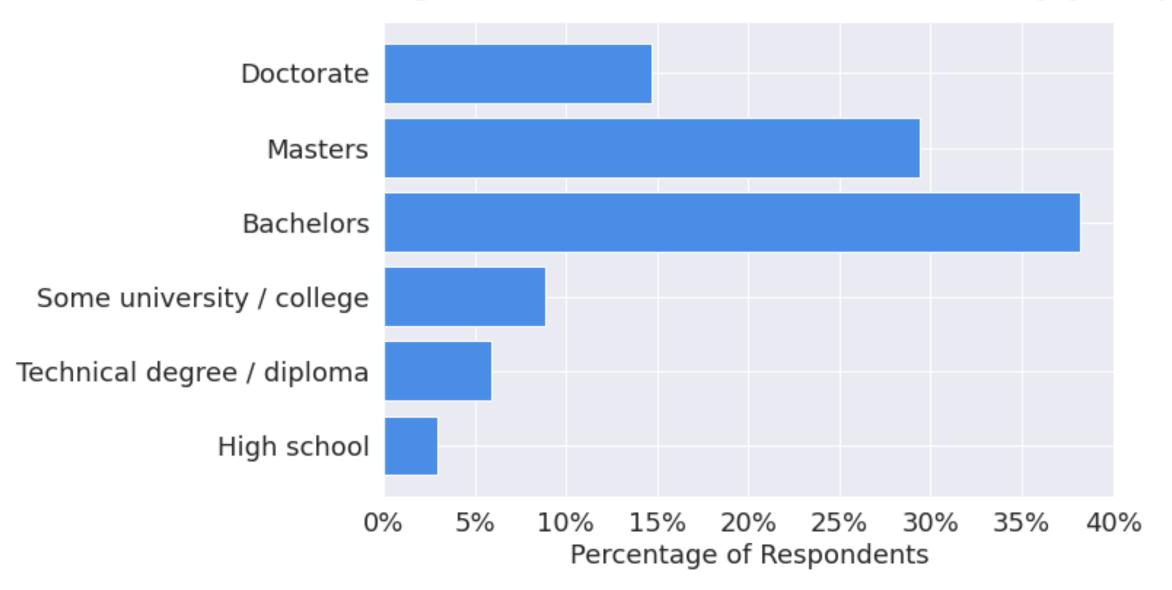
### What was your household income at the start of university?



had at least one parent complete a bachelors degree, or higher

The apple doesn't fall too far from the tree.

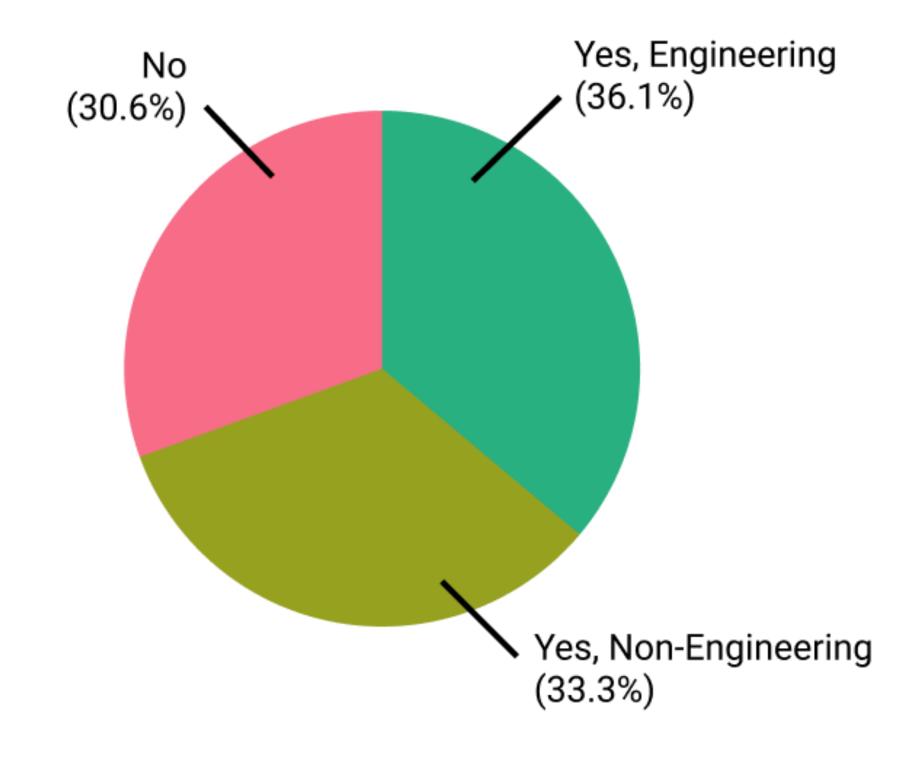
#### Whats the highest level of education achieved by your parents?



of Management Engineer's had a parent work in STEM.

Wow. Most were exposed to STEM before entering it. But the majority are first generation engineers.

## Have your parents worked in a STEM related field?



## Demographics

## High School

Academics

Social Life at Waterloo

Health at Waterloo

Co-op Experience

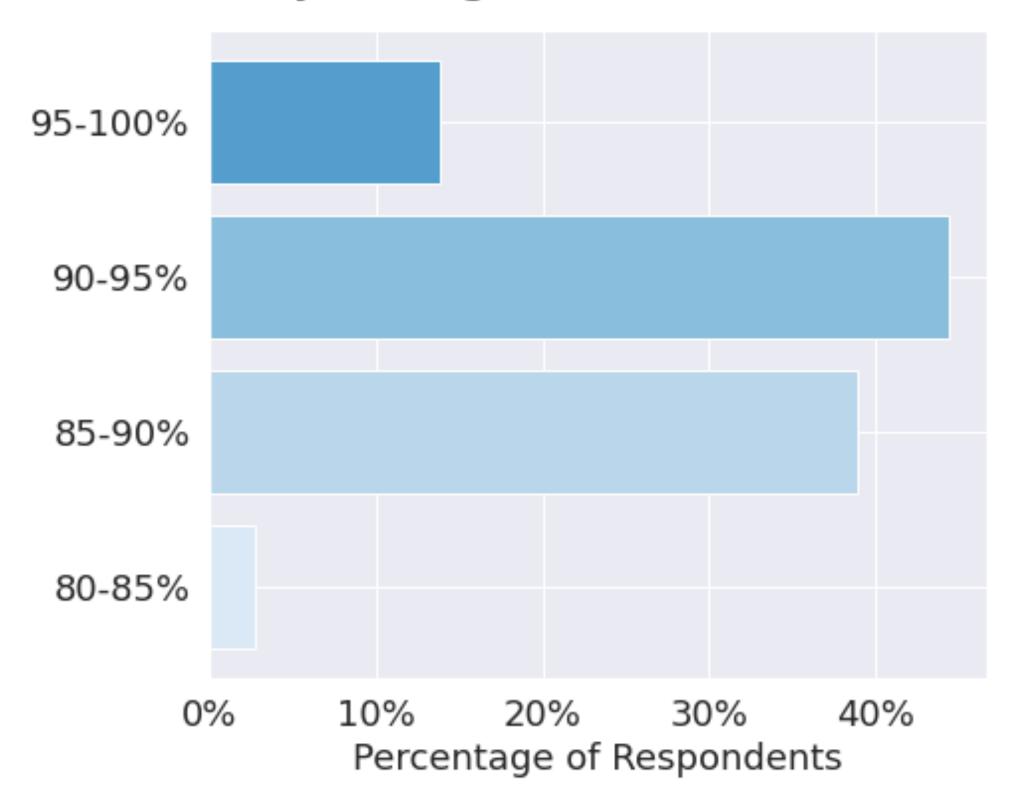
Future: Finances + Career





was the average admissions averages for our respondents

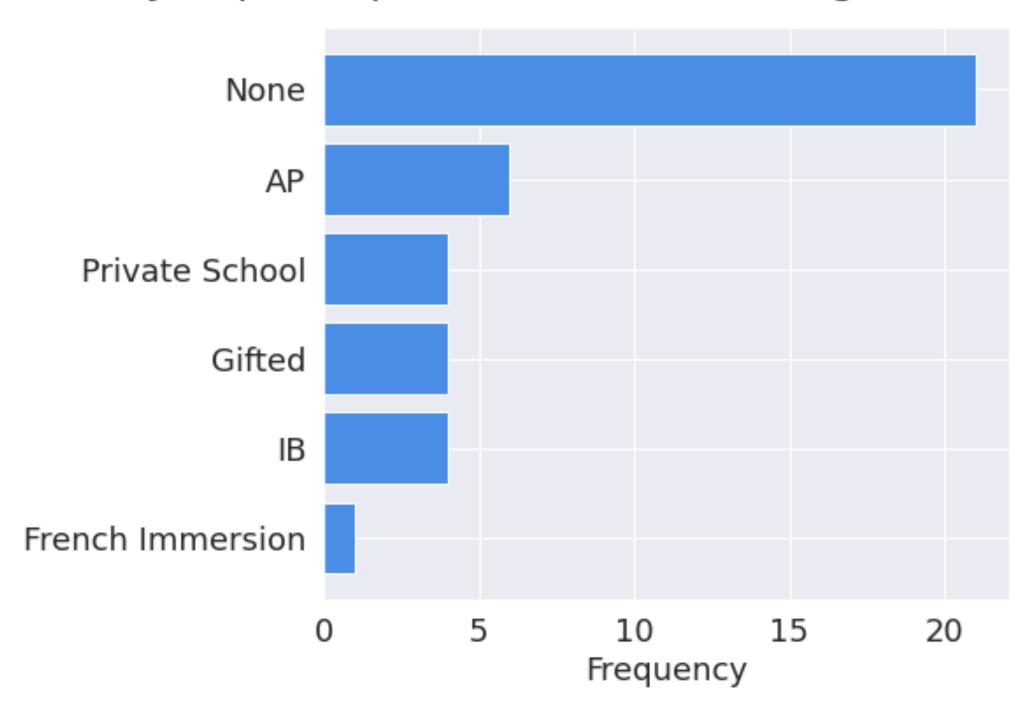
## What was your high school entrance average?



Most of us did not 'accelerate' into UW

In comparison, 63.4% of Software Engineering 2020 alum participated in enriched programs in high school.

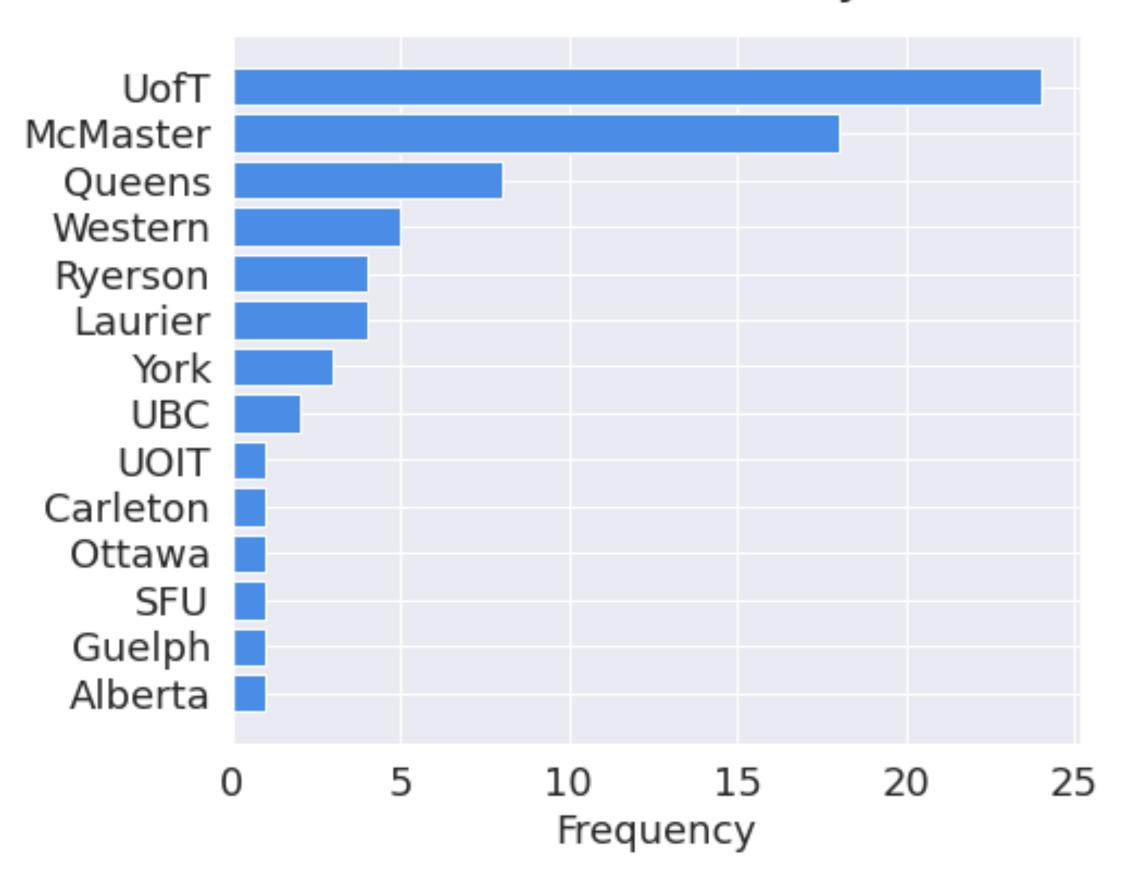
Did you participate in accelerated high school programs?



A lot of us could have ended up at UofT or McMaster instead.

Most of the class grew up in Ontario, which suggests that respondents preferred applying to universities within their home province.

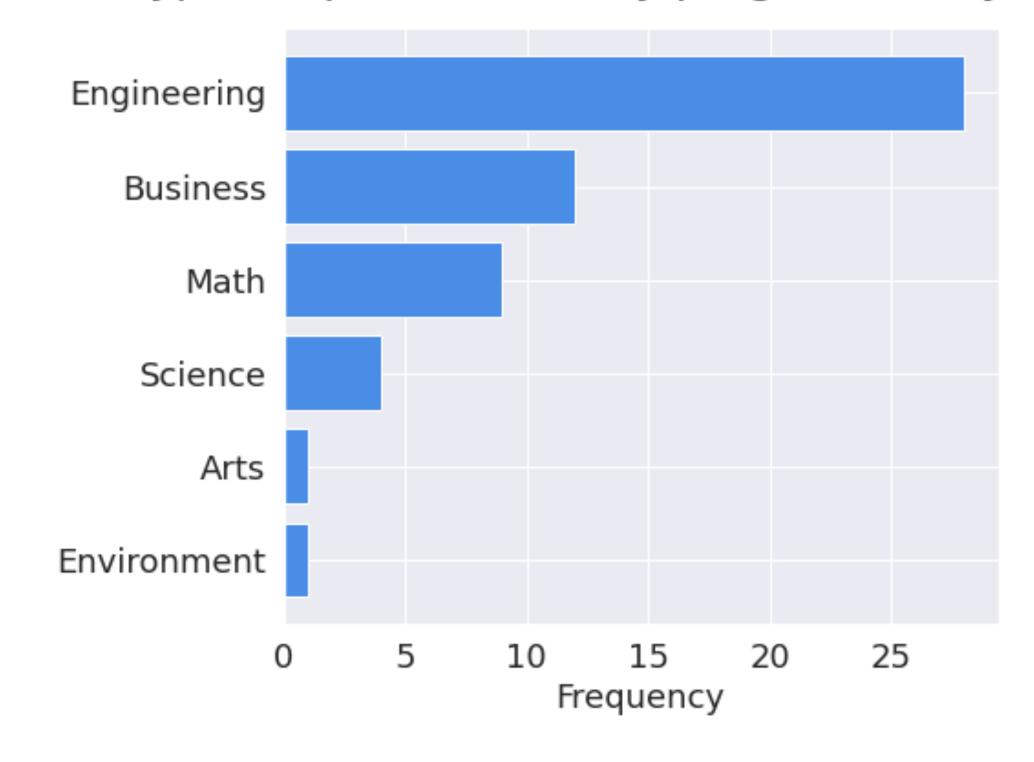
## What other univerisites did you consider?



Not all of us were looking exclusively for Engineering degrees.

At least a third of respondents considered a business degree instead.

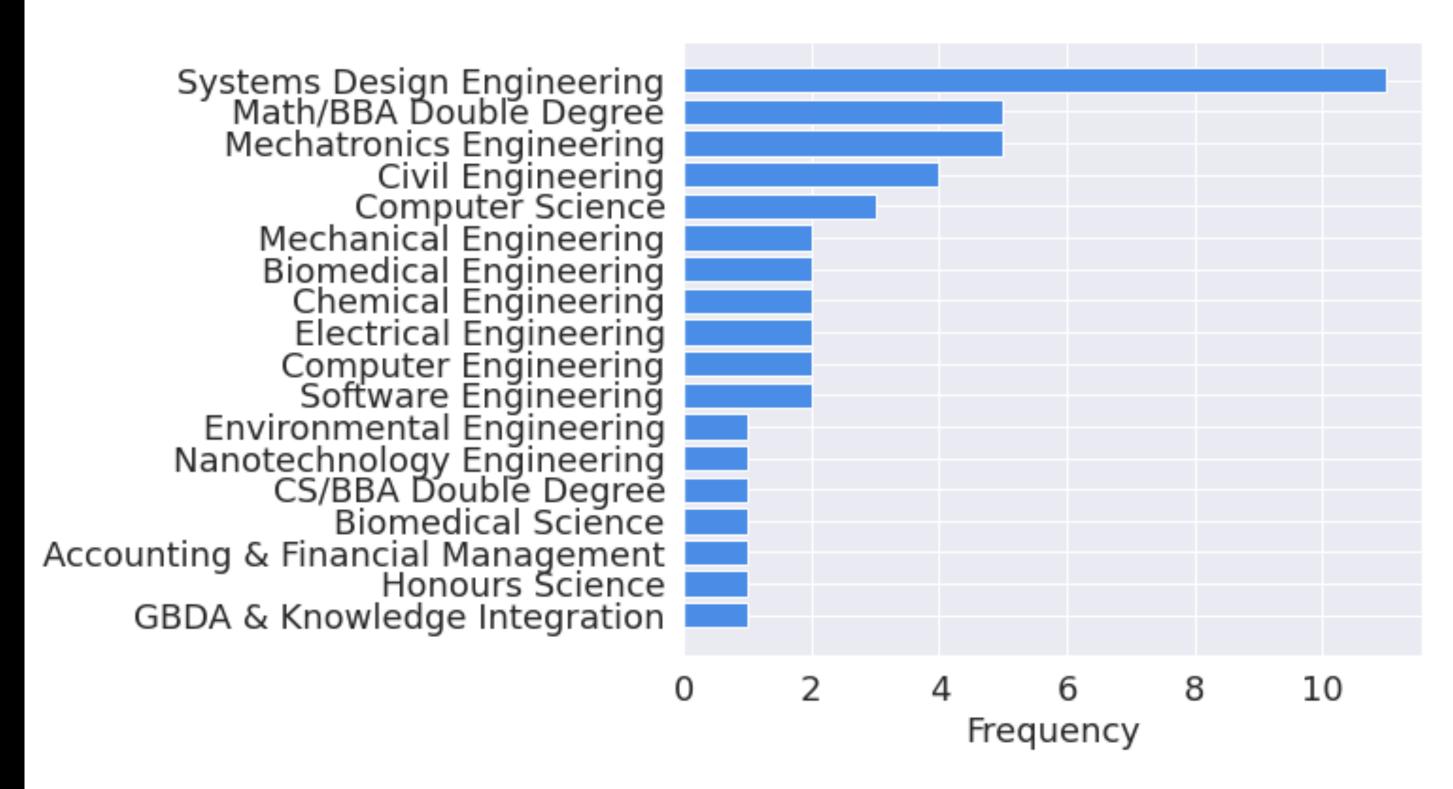
What types of post-secondary programs did you apply to?



But when applying to Waterloo, most of us applied for Engineering.

A lot of us might have ended up in the SYDE class.

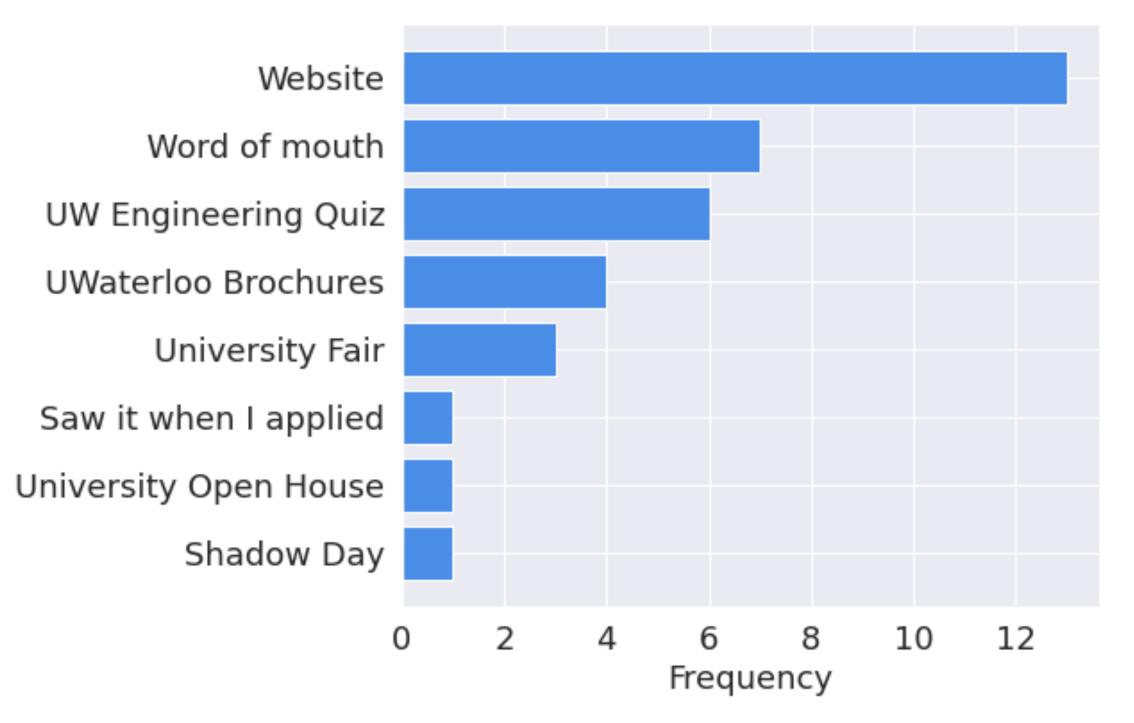
Which of these programs did you apply to at Waterloo?



The Waterloo website was a lot of us discovered the program.

What's Management?

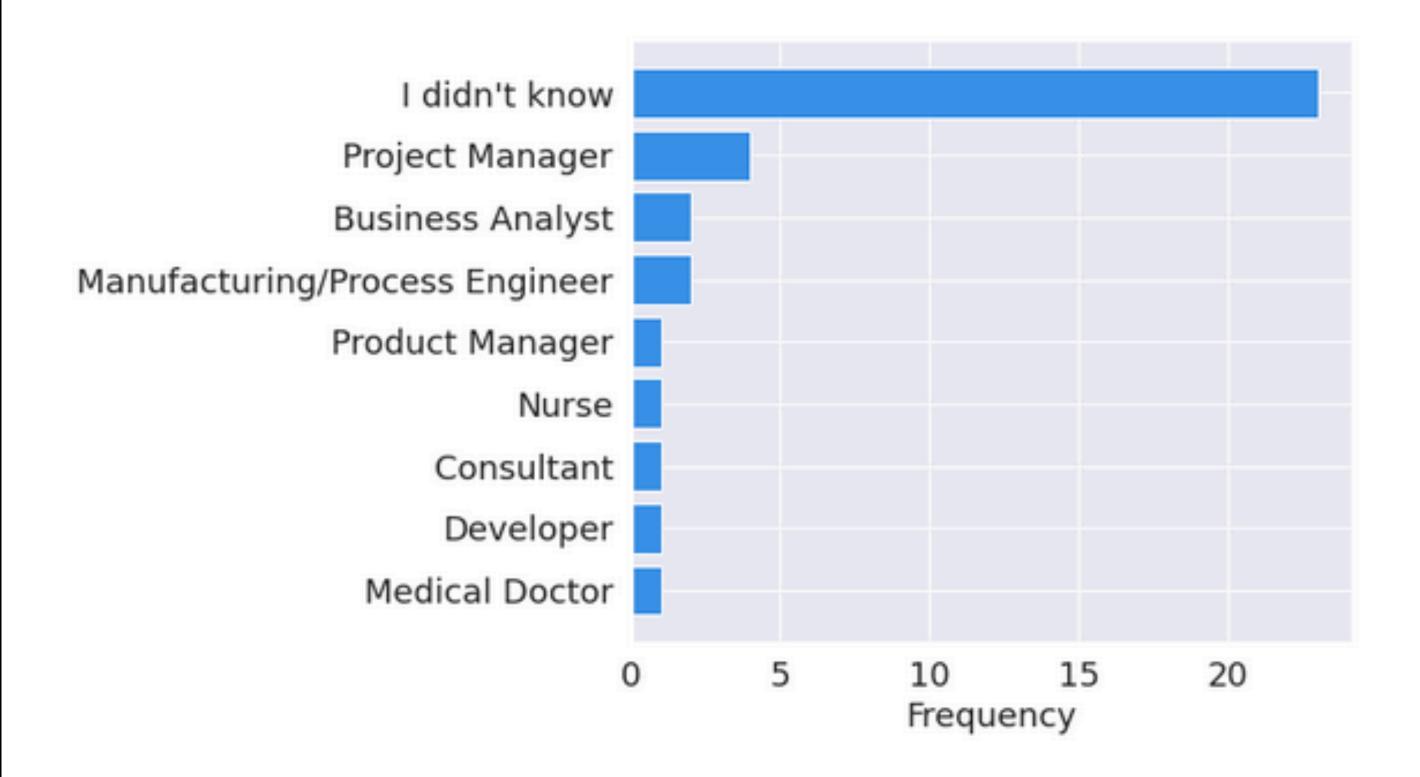
## How did you discover Management Engineering?



Most of us had no idea what we wanted to do for our career.

Anecdotally, this phenomenon is discussed a lot within the class. More than a few of us felt like the program could've done more to help us explore the different career paths available and how the program would support them.

## What was your ideal career upon entering Waterloo?



Demographics
High School

## Academics

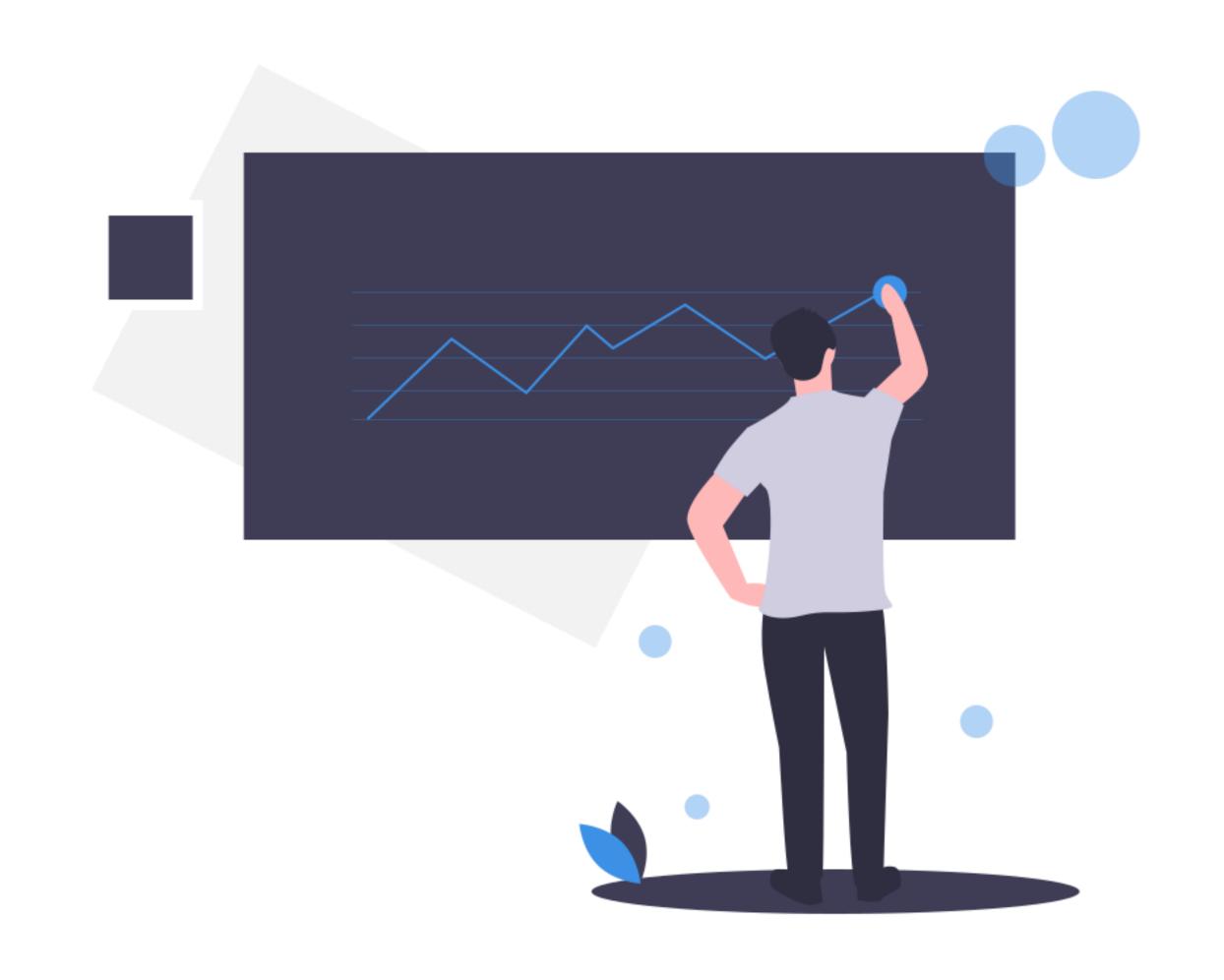
Waterloo Experience: Social

Waterloo Experience: Health

Co-op Experience

Future: Finances + Career

Future: Reflection

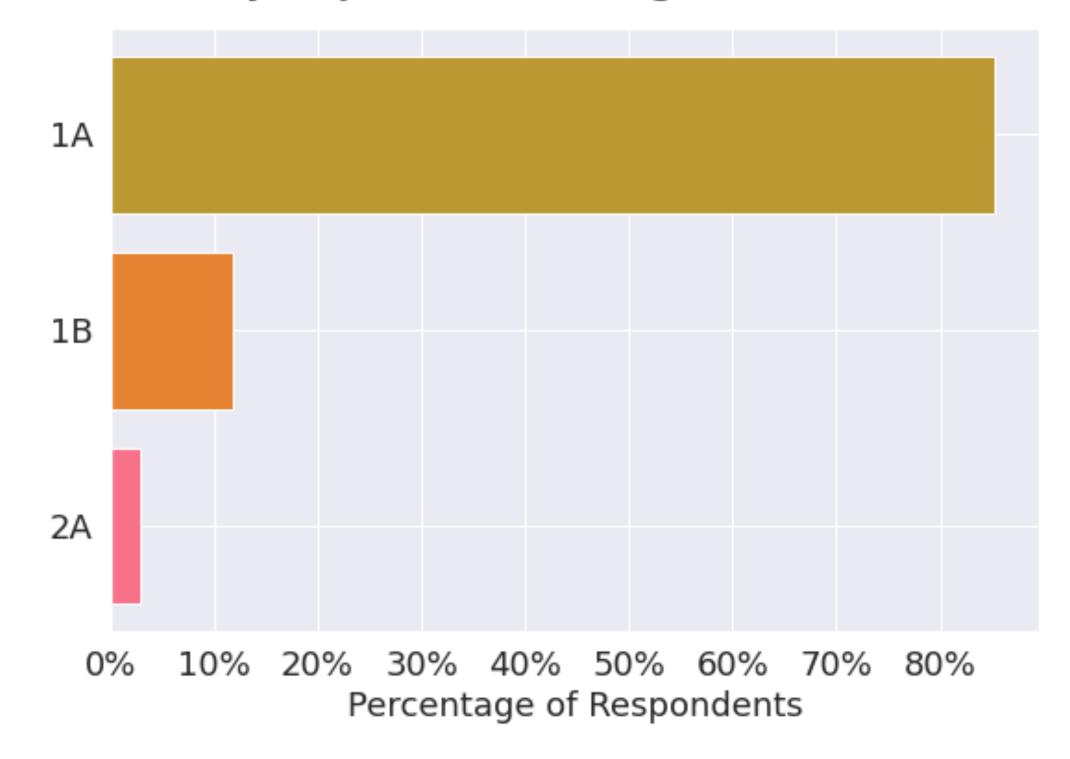




of the class joined in 1A.

Based on class (and social activities since we didn't all go to class all the time) thats about 3000 hours spent together.

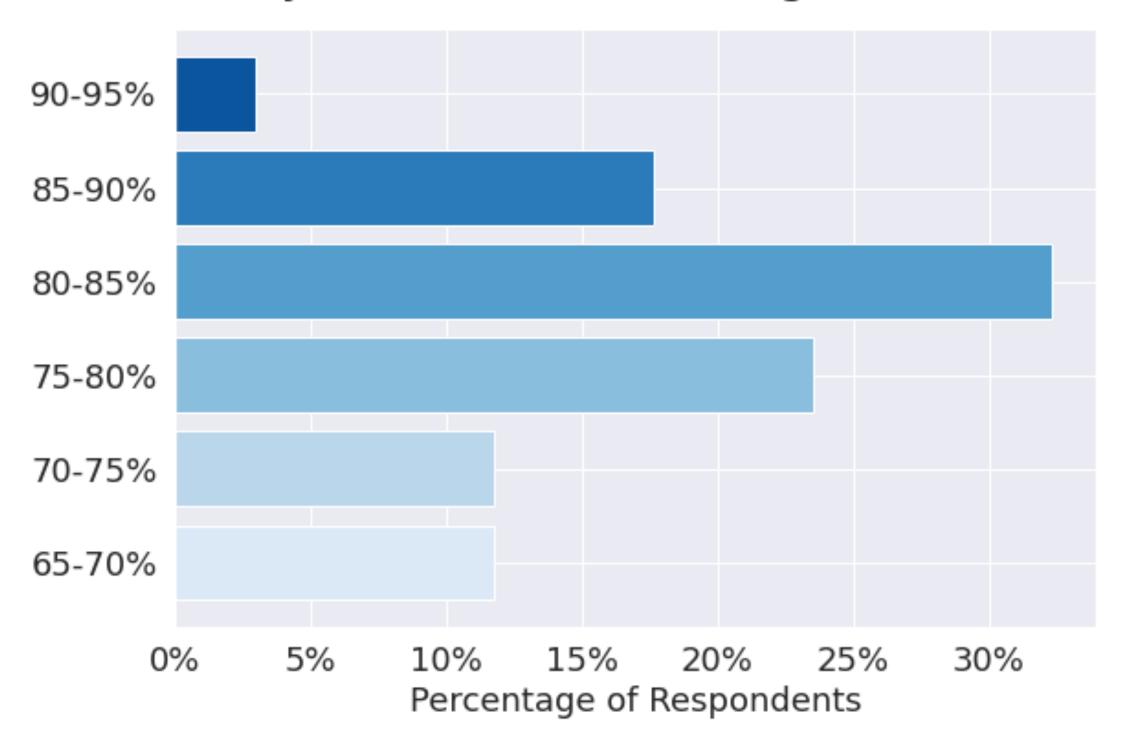
### When did you join the management 2020 cohort?



of the class had a cumulative average of over 80%.

Smart cookies.

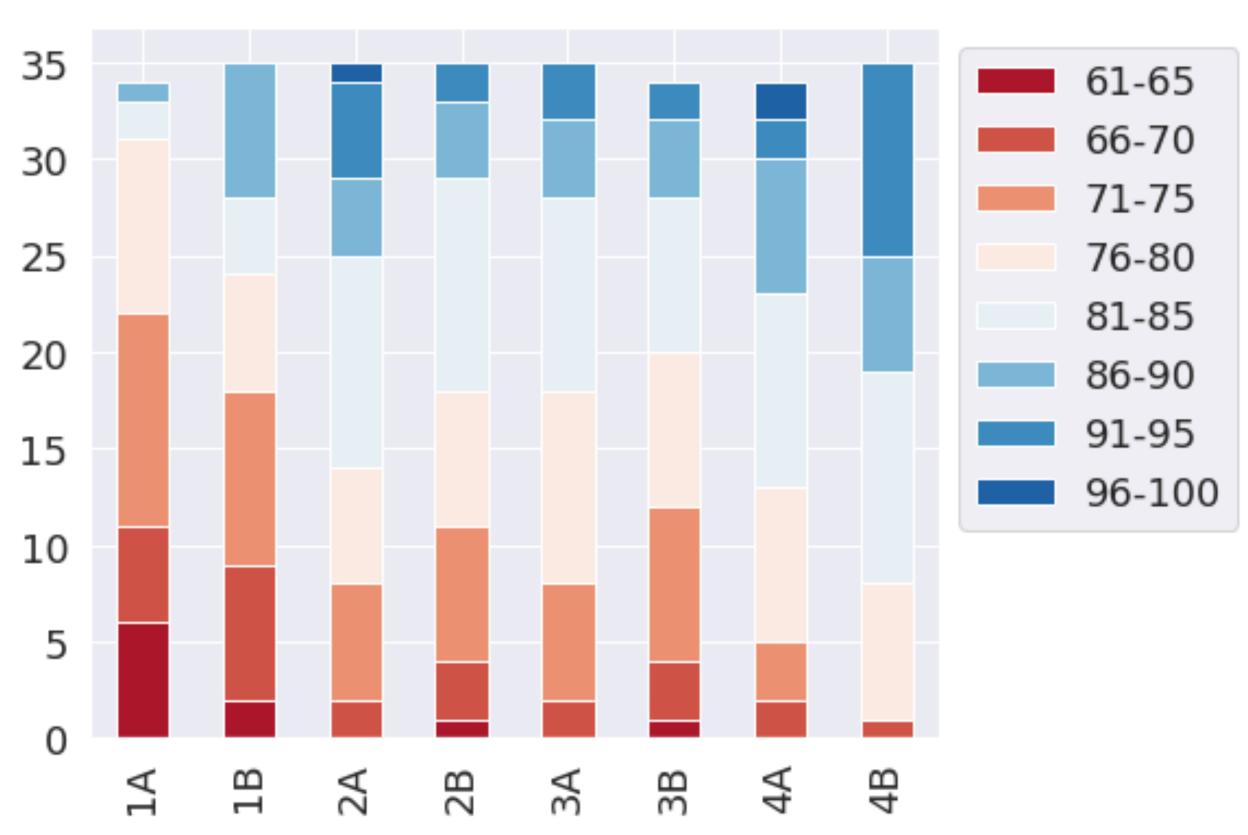
### What was your cumulative average across all terms?



Averages were lowest in 1A, highest in 4B.

The anecdote that 3B is the most difficult term after first year is supported by the data.

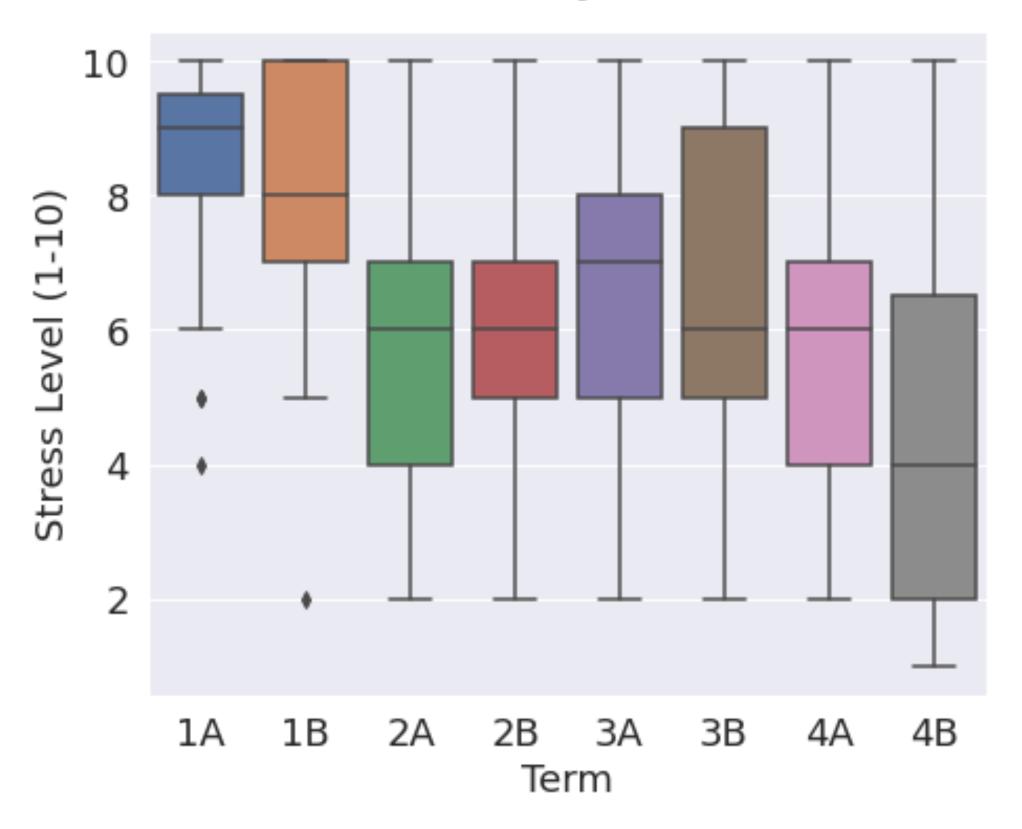




Overall student stress decreased throughout the degree.

3A and 3B were difficult terms for the program.

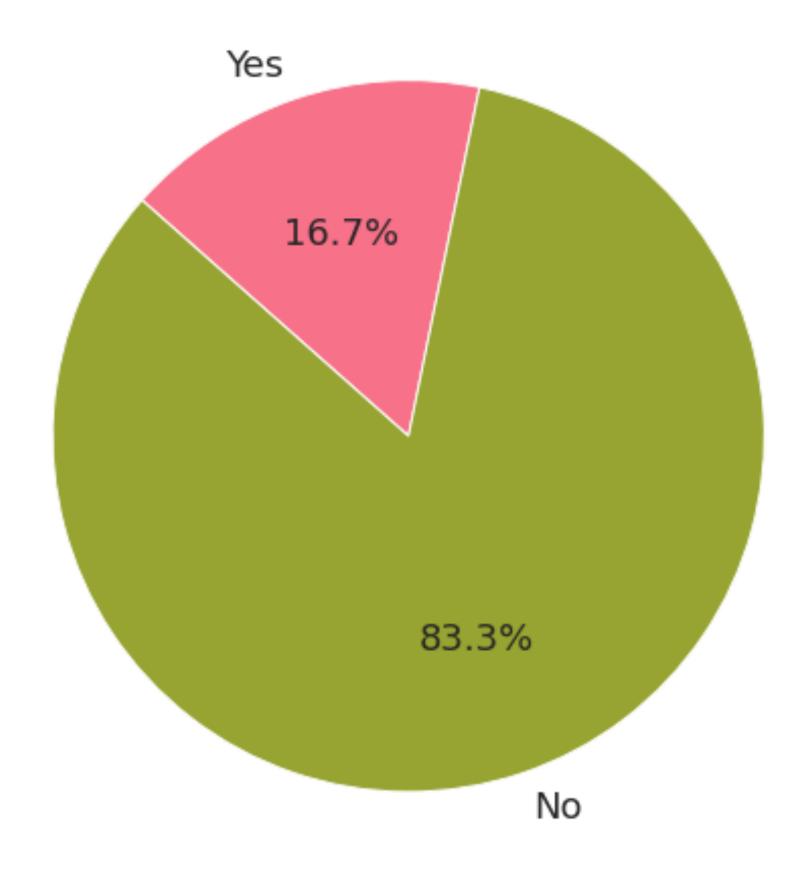
## How stressful was your school term?



of students failed at least one course during their degree.

It probably seemed like the end of the world at the time. You're not the only one. We all have our strengths and weaknesses, but still make it through.

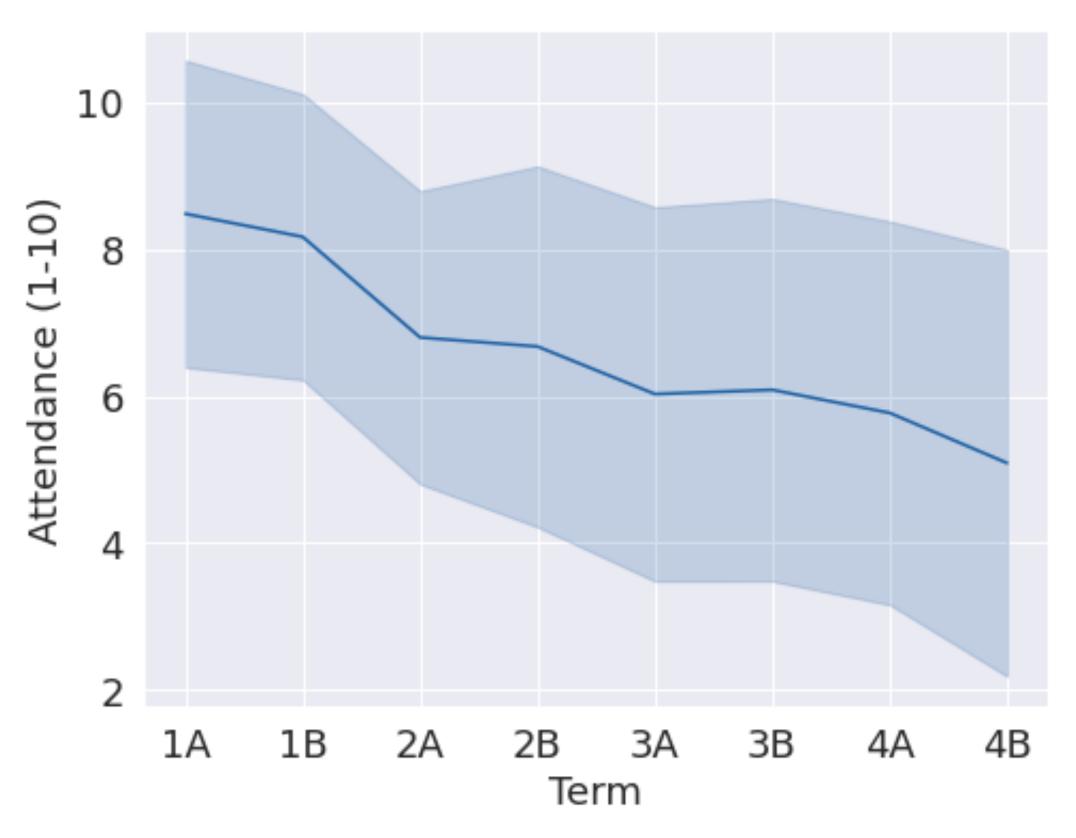
## Have you failed a term?



Class attendance steadily decreased throughout our degree.

Although attendance decreased, averages seemed to improve throughout our degree - suggesting that our class got better at studying.

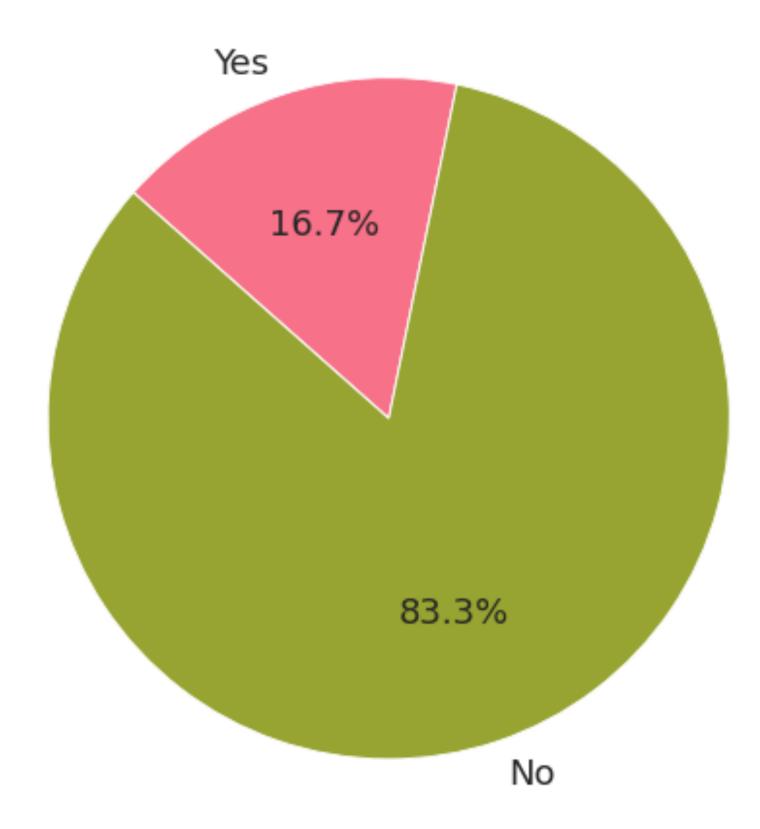
## How often did you attend class?



of students failed a term.

Hey, things happen. But we made it.

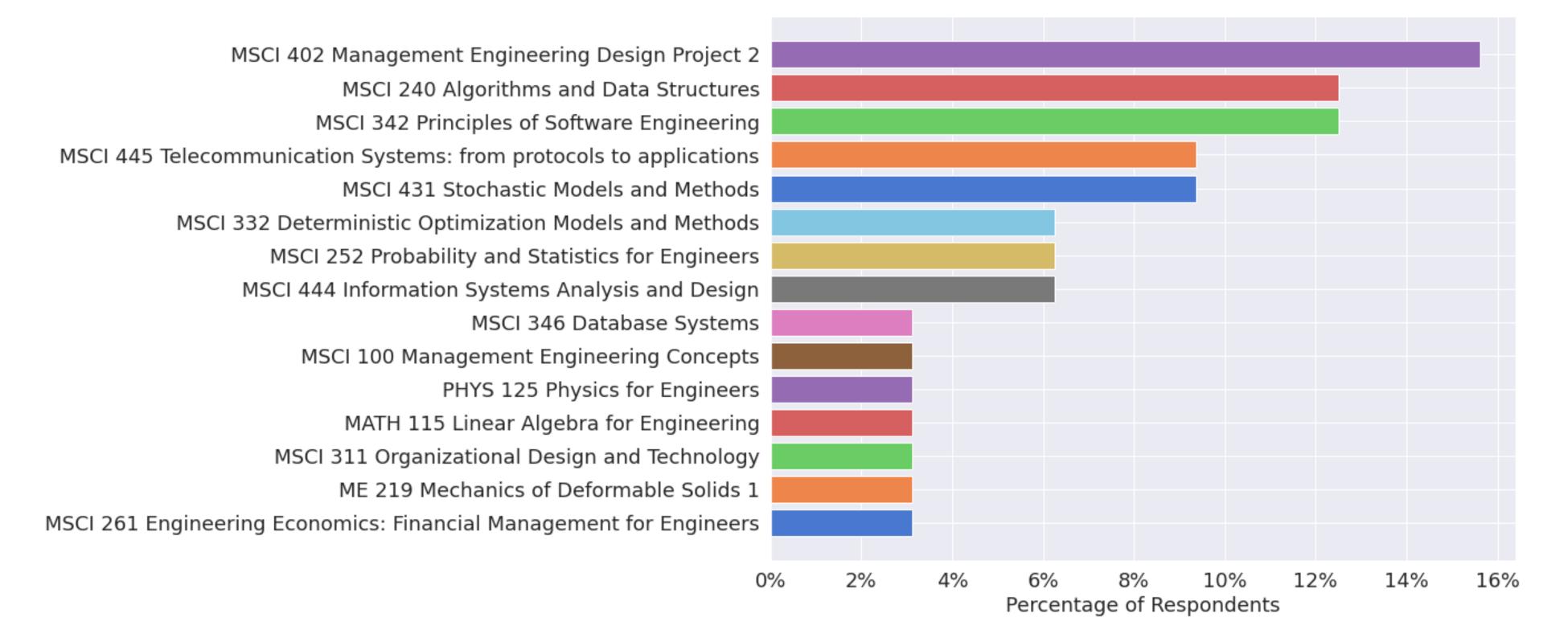
## Have you failed a term?



Our class was most interested in FYDP (402), Data Structures (240) and Software Eng. (342)

Although interests varied in the class, respondents were most interested in gaining a technical understanding of software concepts.

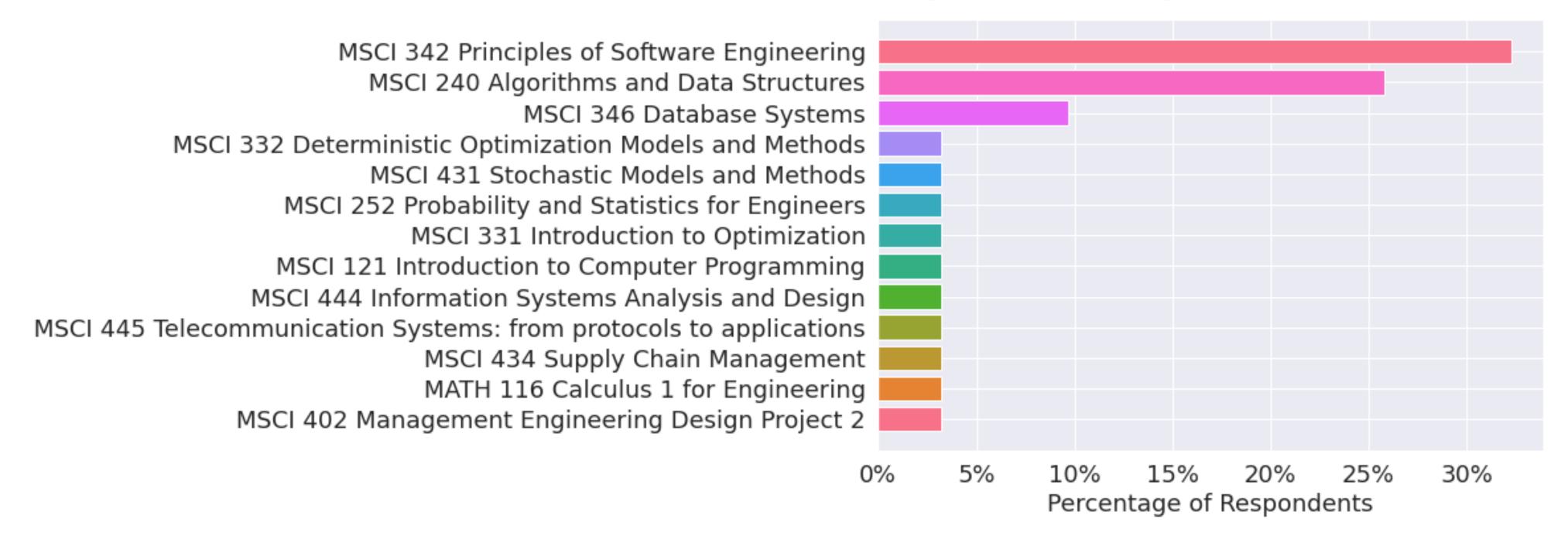
Of the mandatory courses that you took, which was the most interesting?



MSCI 342 and MSCI 240 were far and away the most useful courses.

Shoutout to Dr. Mark Smucker... and his friend at Google.

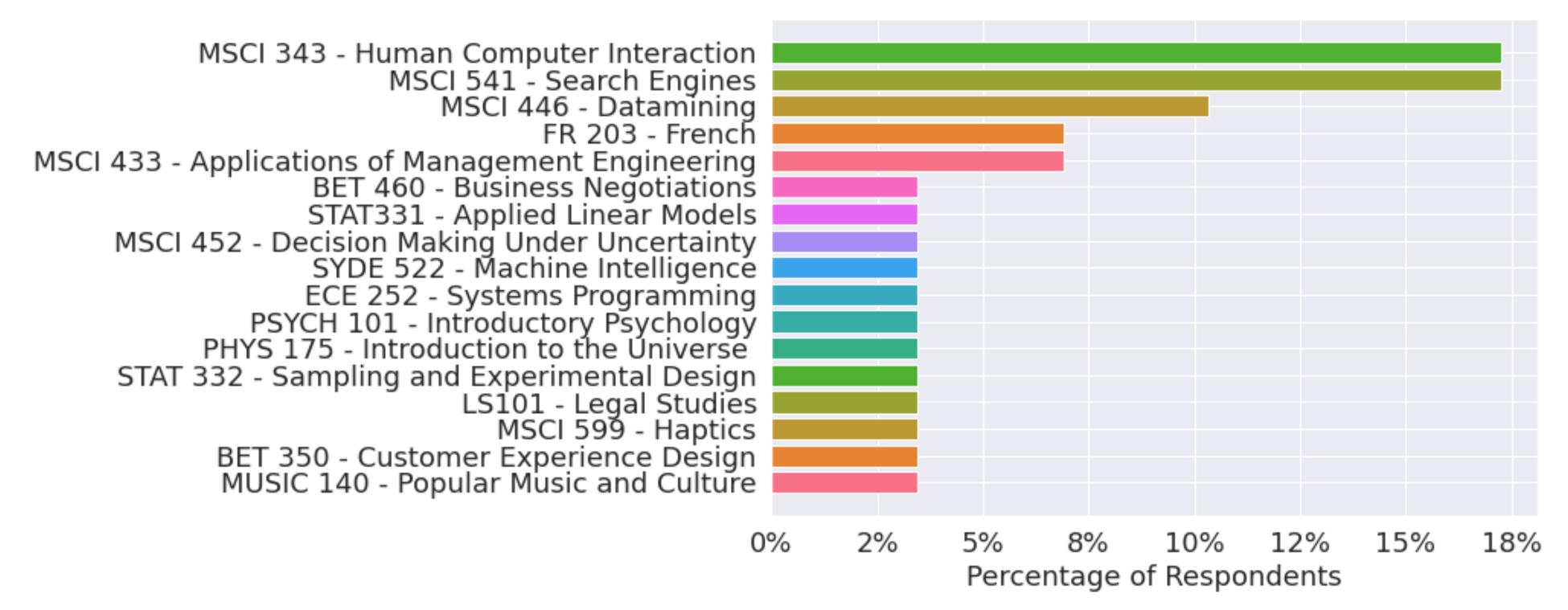
Of the mandatory courses that you took, which was the most useful?



Human Computer Interaction,
Search Engines and Data Mining
were well-liked electives

Even though students were offered the ability to try other departments' courses, we still liked Management courses the most.

Of the electives that you took, which one was the most interesting?

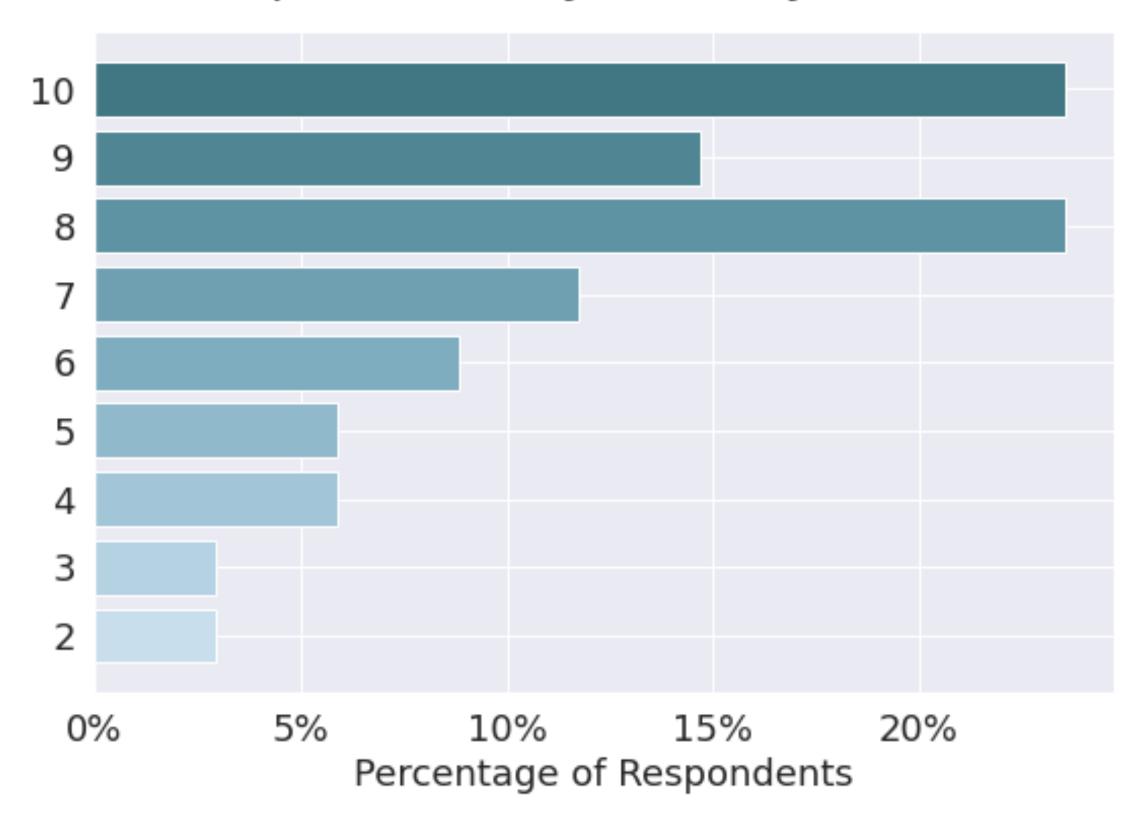


was the average pride for our FYDPs.

Overall, we were happy with our FYDPs.

Which is pretty good considering the amount of time we spent on them.

# How proud were you with your FYDP?

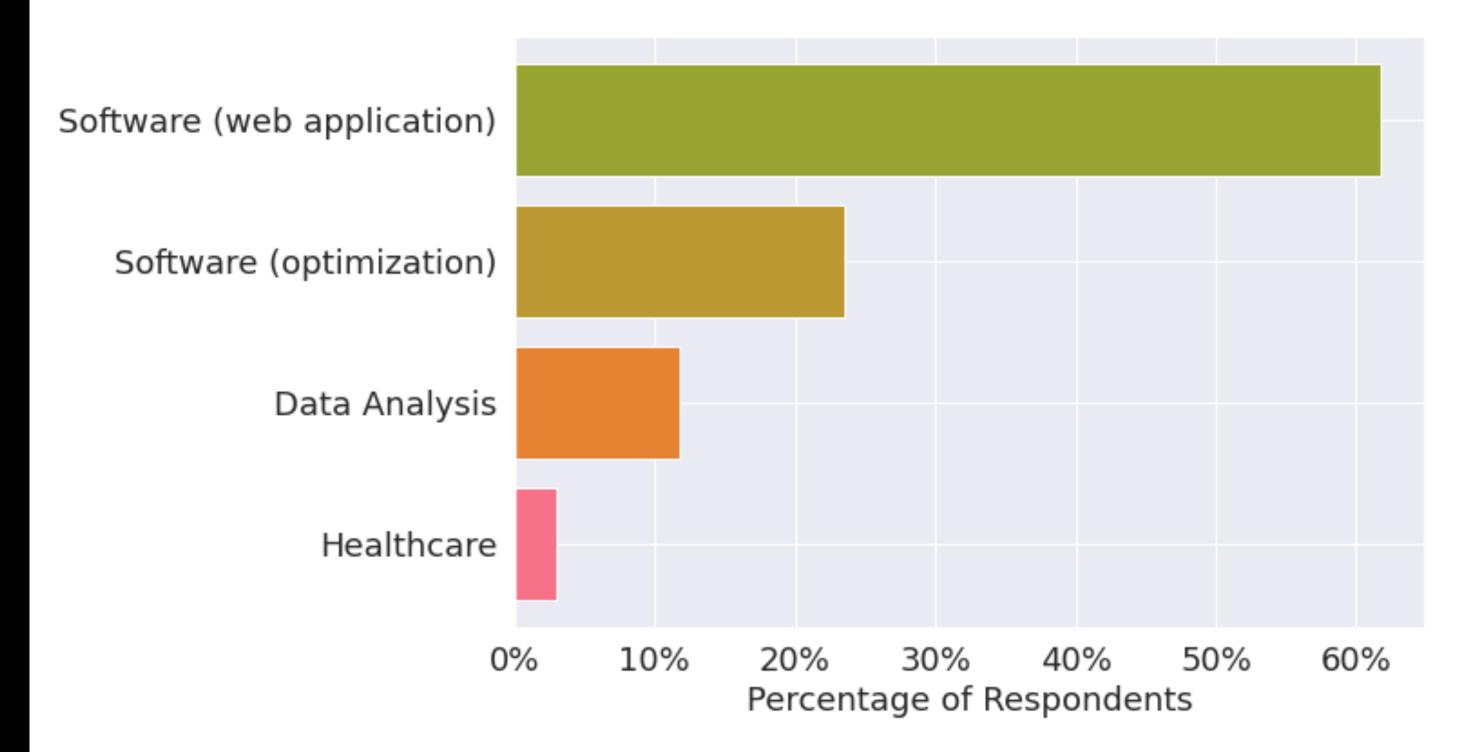


**84%** 

of FYDPs focused on a software application or optimization.

And people say Management Engineers aren't technical... this says otherwise.

## What domain most accurately describes your FYDP?

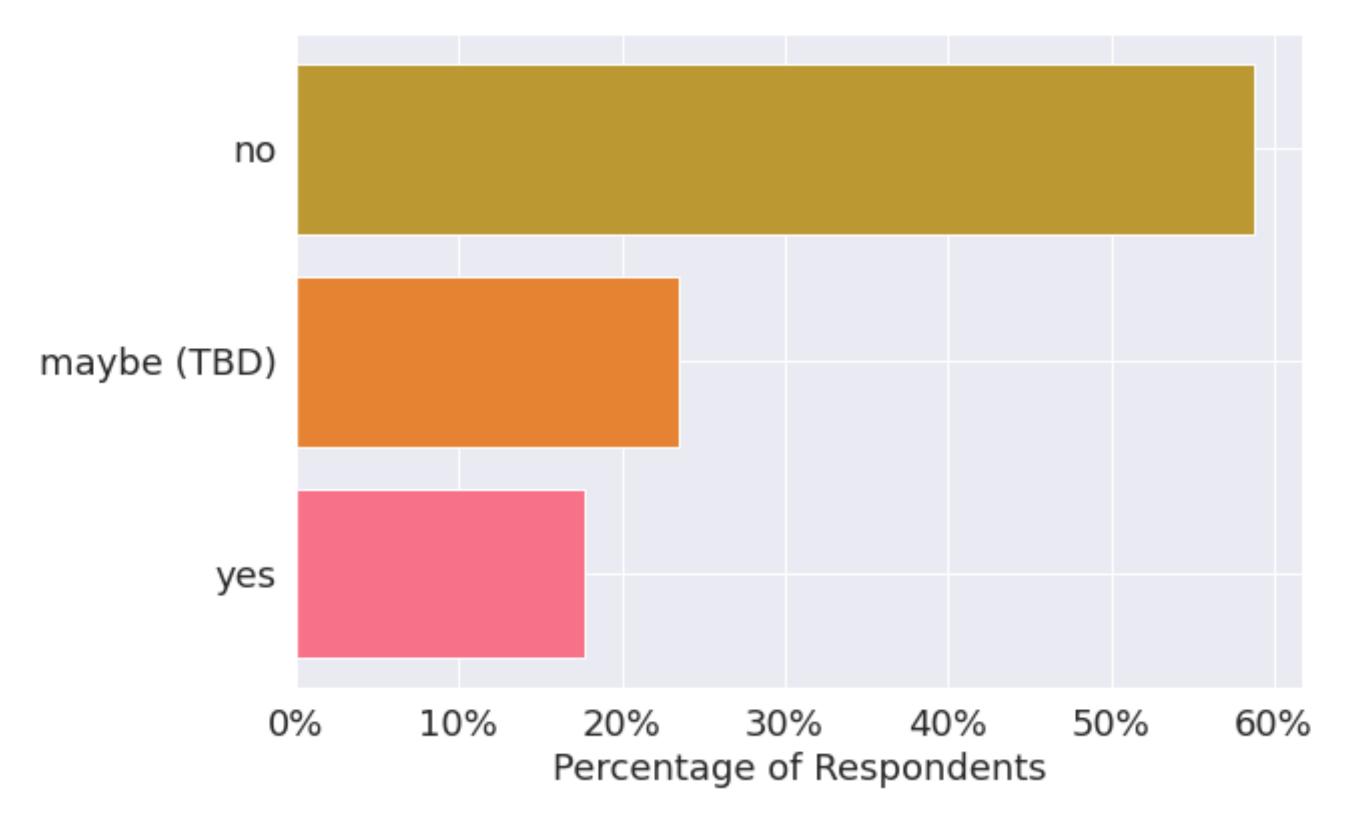


410

are working on, or considering working on their FYDP after graduation.

Guess we haven't had enough yet!!

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



Demographics

High School

Academics

Social Life at Waterloo

Health

Co-op Experience

Future: Finances + Career

Future: Reflection



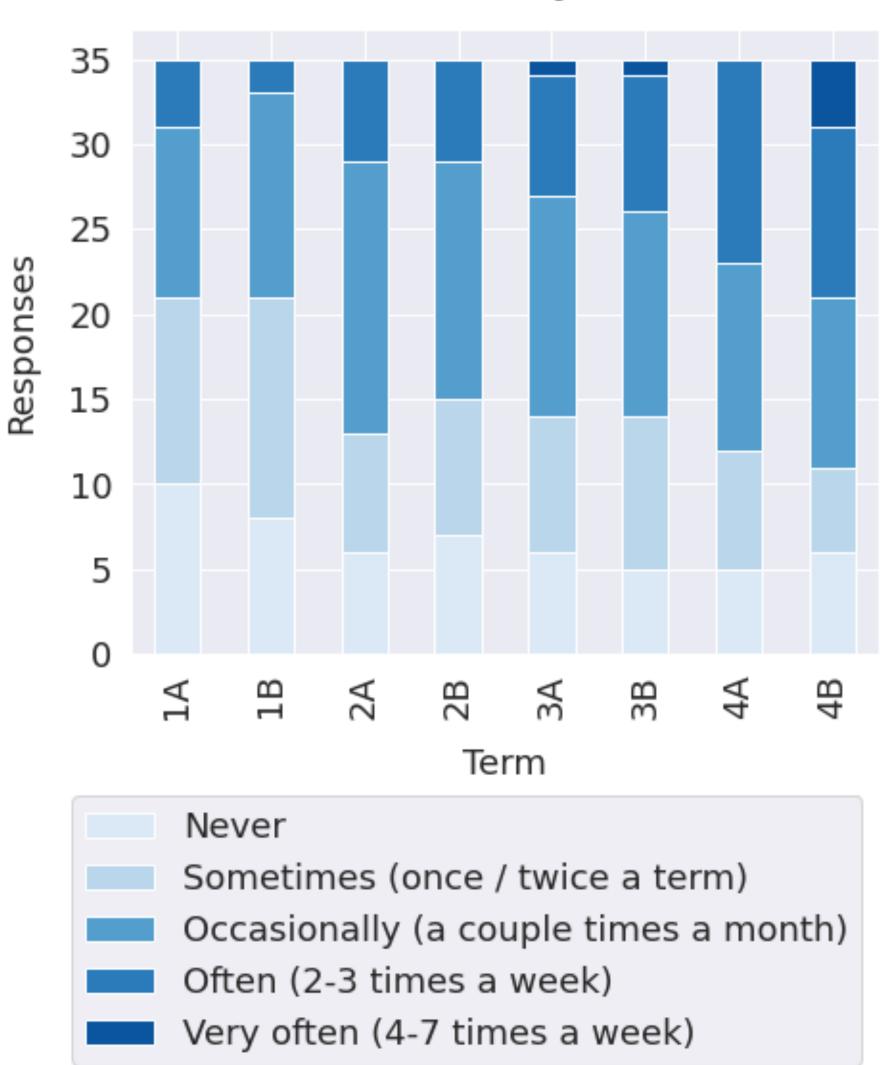


## SOCIAL LIFE AT WATERLOO

'Often' or 'Very Often' consumption of alcohol increased throughout our degree

Occasional alcohol consumption also had a sharp increase once the class turned 19.

# How often did you drink?

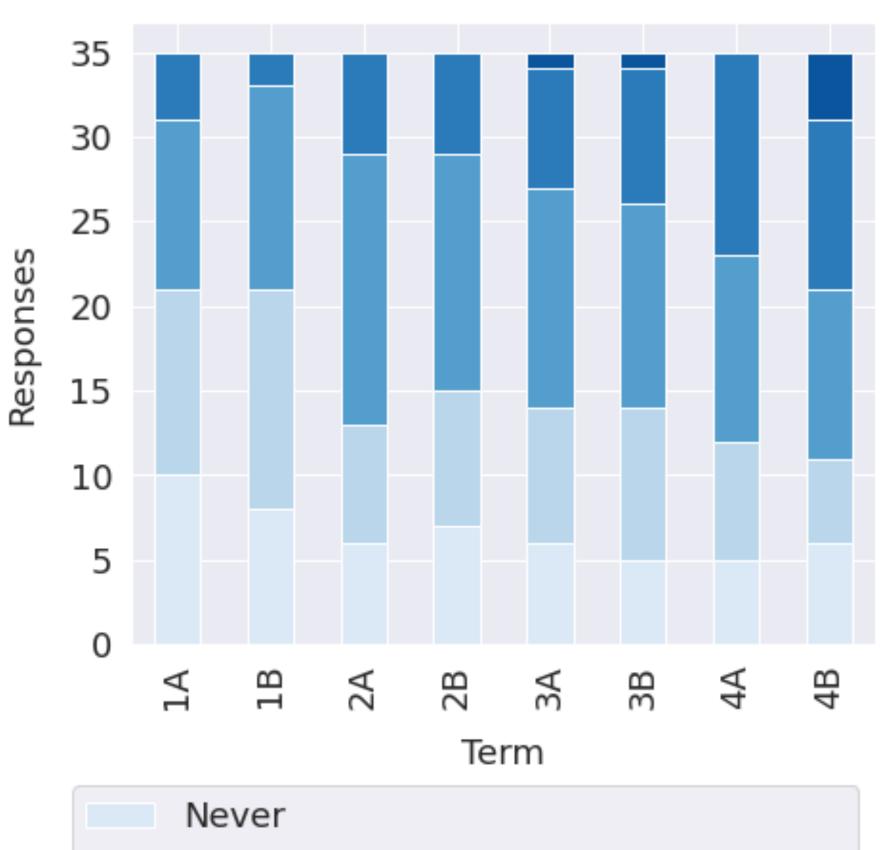


## SOCIAL LIFE AT WATERLOO

Drug use increased sharply in second year.

Maybe students were exploring drugs along with alcohol

# How often did you use drugs?

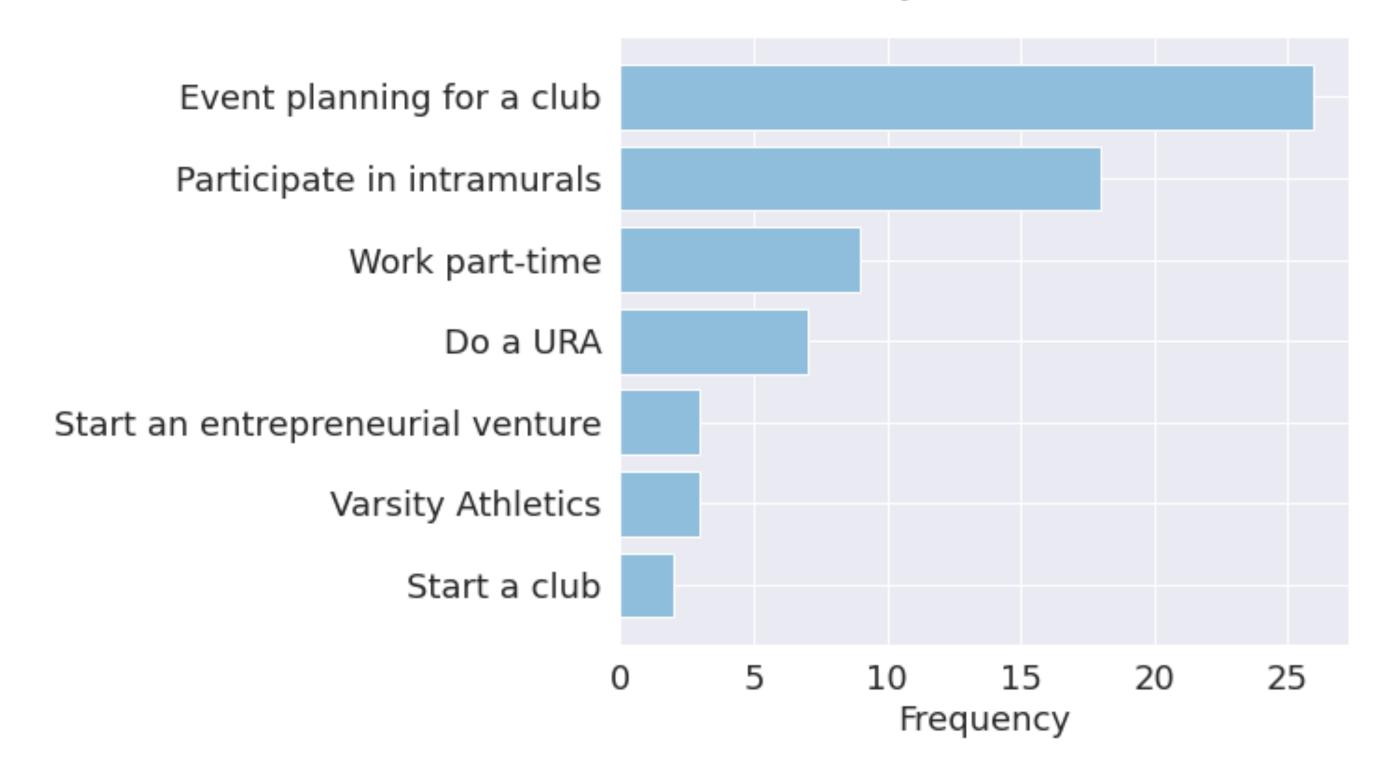


Never
Sometimes (once / twice a term)
Occasionally (a couple times a month)
Often (2-3 times a week)
Very often (4-7 times a week)

Event planning and intramurals were popular extra-curricular activities.

Almost a third of respondents also worked parttime at some point during their degree.

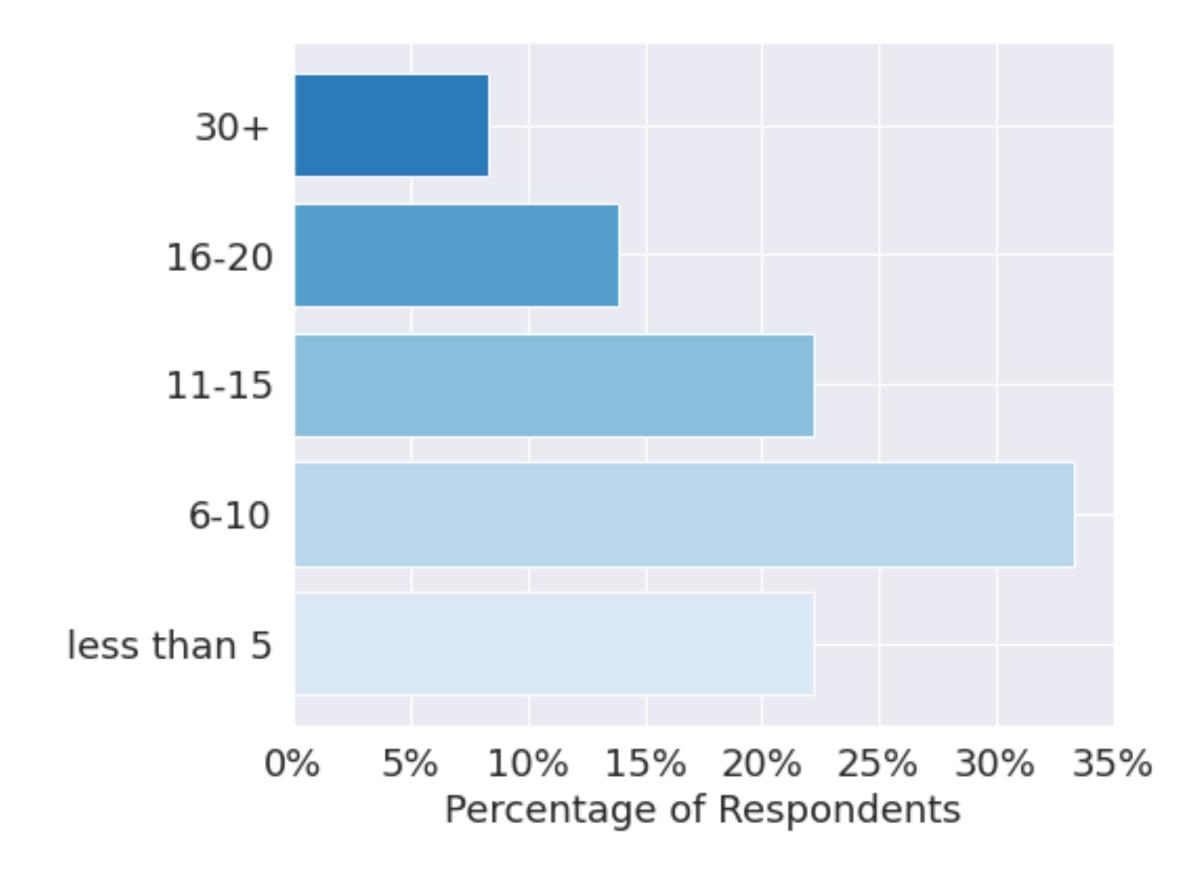
## Which extracurricular activities did you do at UW?



40% of respondents would invite more than 11 classmates to their birthday party.

Seems to me like we're pretty friendly with each other

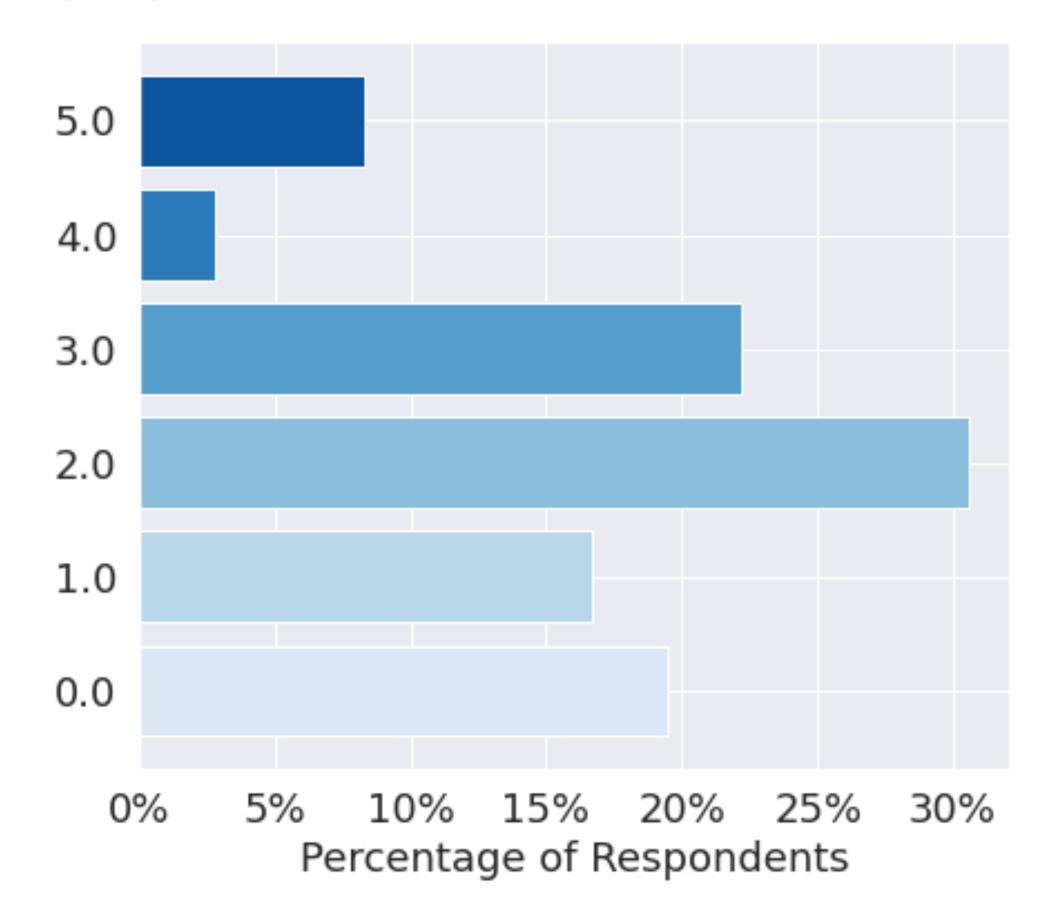
How many classmates would you invite to your birthday party?



of respondents' closest five friends included at least two classmates.

Only 30% of respondents did not include a classmate in their closest five friends.

How many of your closest 5 friends are from the 2020 MSCI class?

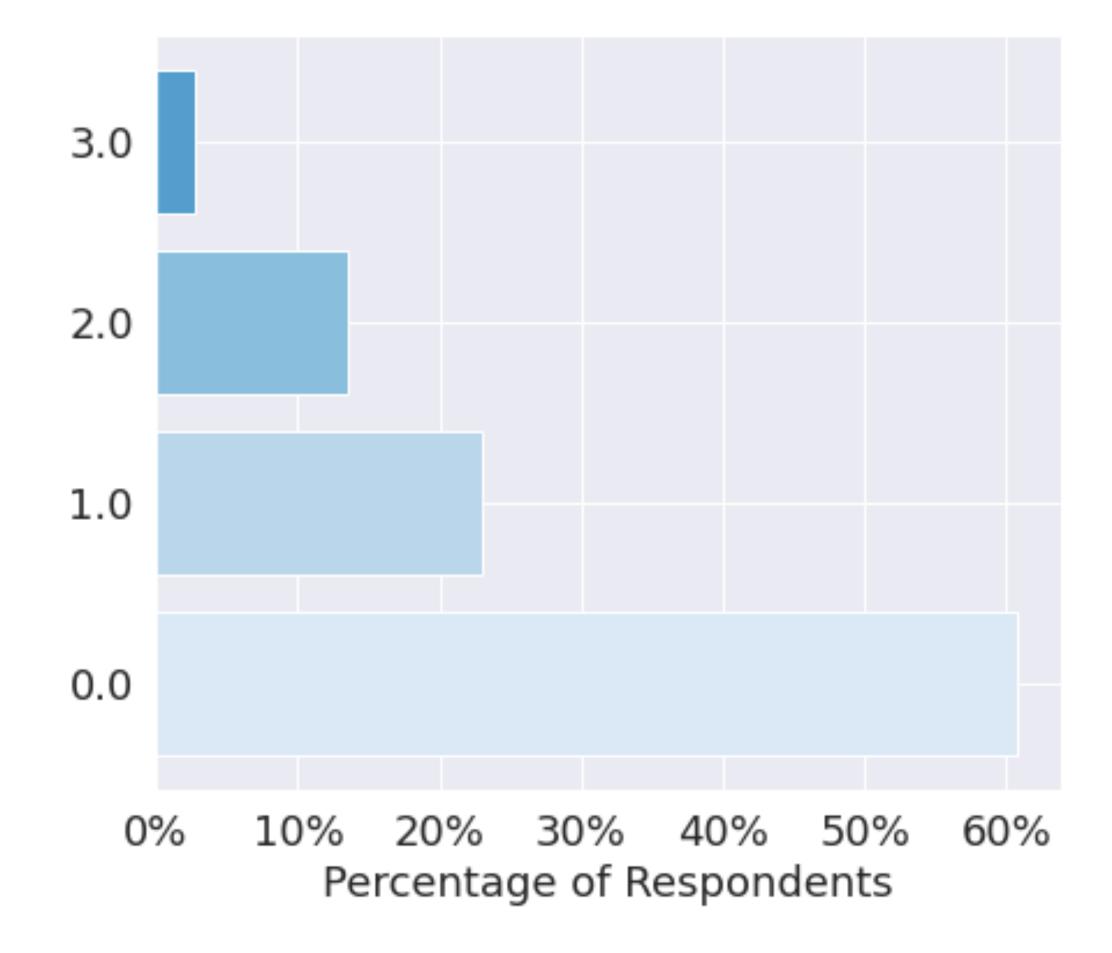


23%

of respondents were in one relationship during university

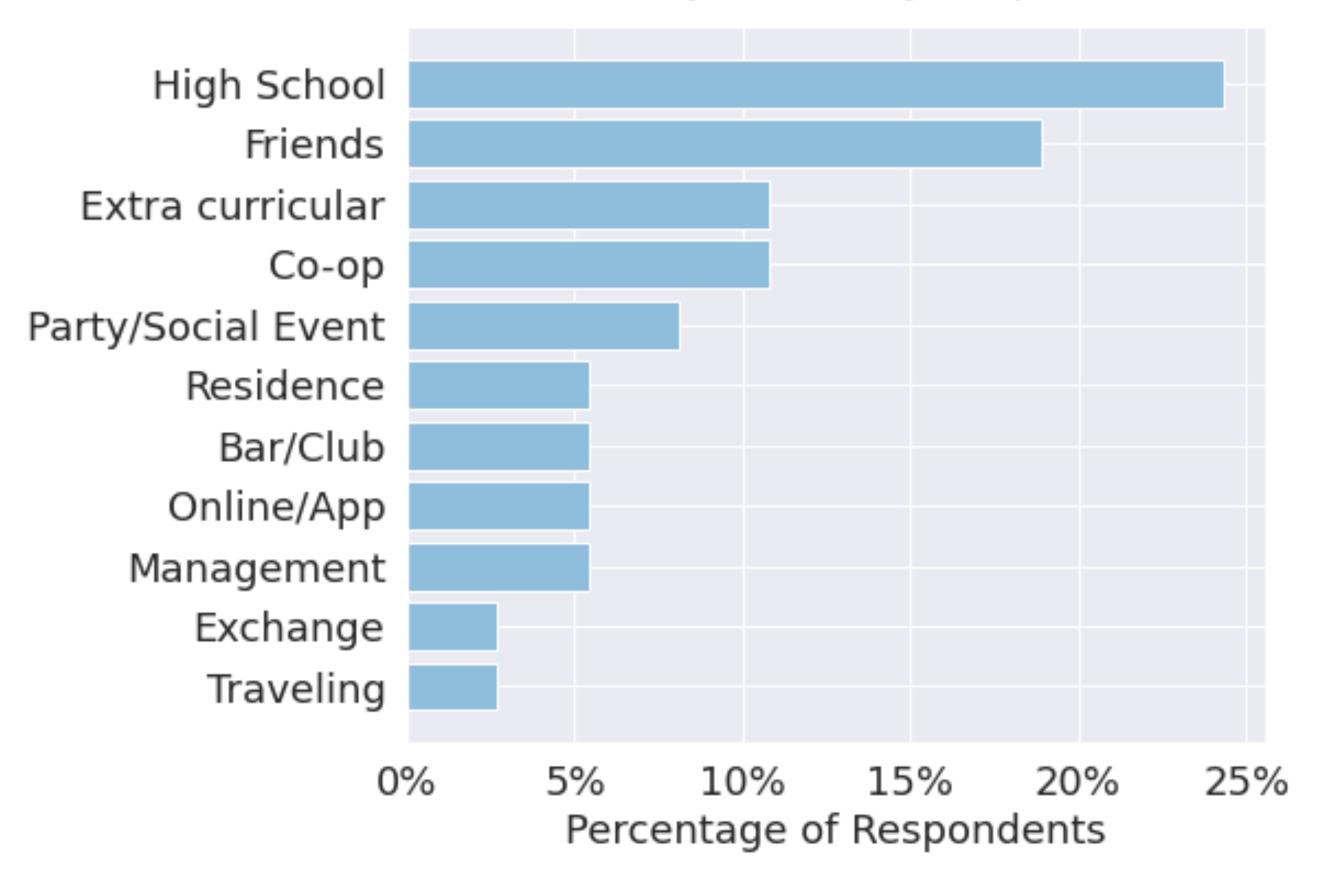
The majority of respondents weren't in a relationship during their university career.

How many long term relationships were you in during university?



High school and friends were the most popular sources of partners for relationships.

## Where did you meet your partners?



of respondents had sex for the first time while at UW.

73% of respondents entered university as a virgin.

Entered UW as a virgin - 22

Left UW as a non-virgin - 25

Did not enter UW as a virgin - 8

Left UW as a virgin - 5

Demographics

High School

Academics at UW

Social Life at UW

# • Health

Coop Experience

Future: Finances + Career

Future: Reflection

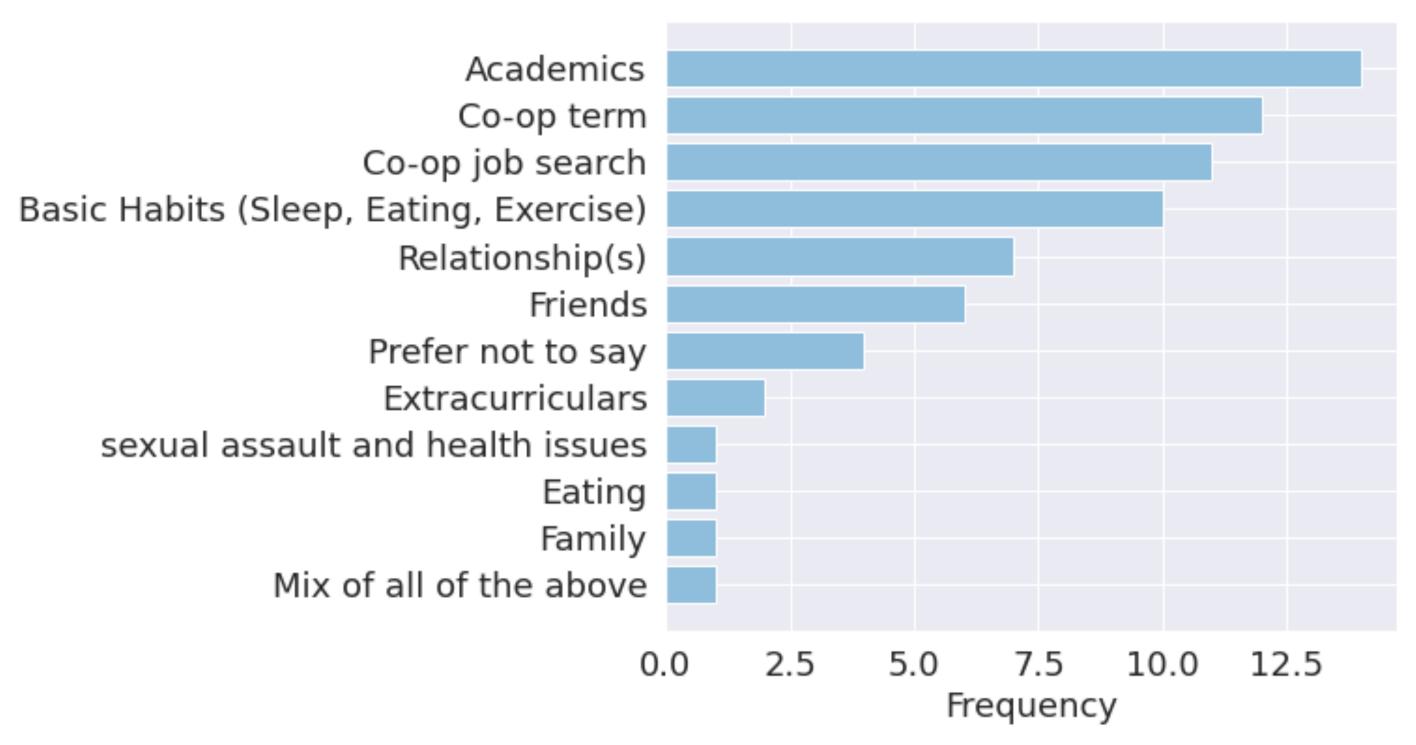




Academics and Co-op were the top factors affecting mental health.

Perhaps more frequent conversations about what we as classmates, or what the program could do to help would be beneficial for future cohorts.

## What caused your mental health to change?

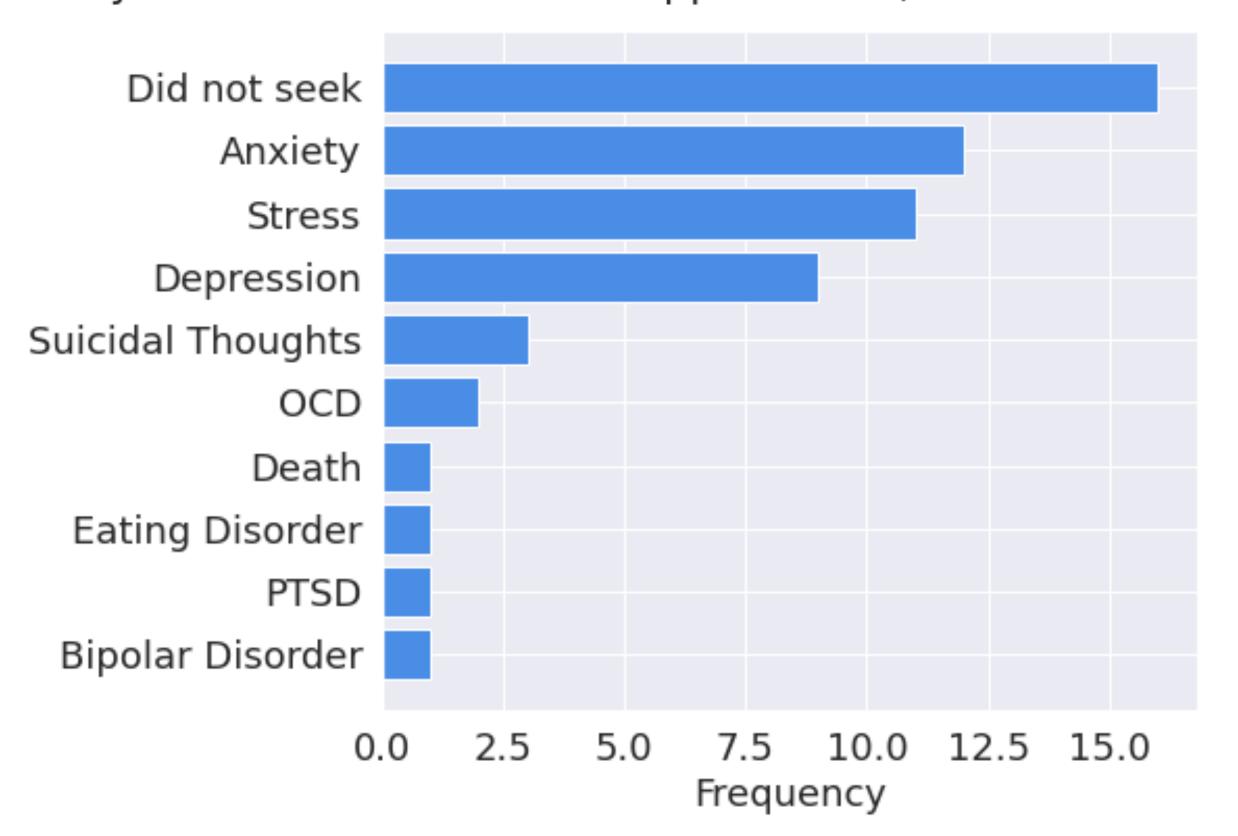


Anxiety was the most common issue that students sought help for.

I wonder if there's a way that Waterloo could integrate practices into its culture that help soothe anxiety.

We regret not differentiating between 'Did not want help' and 'Wanted help but did not seek'

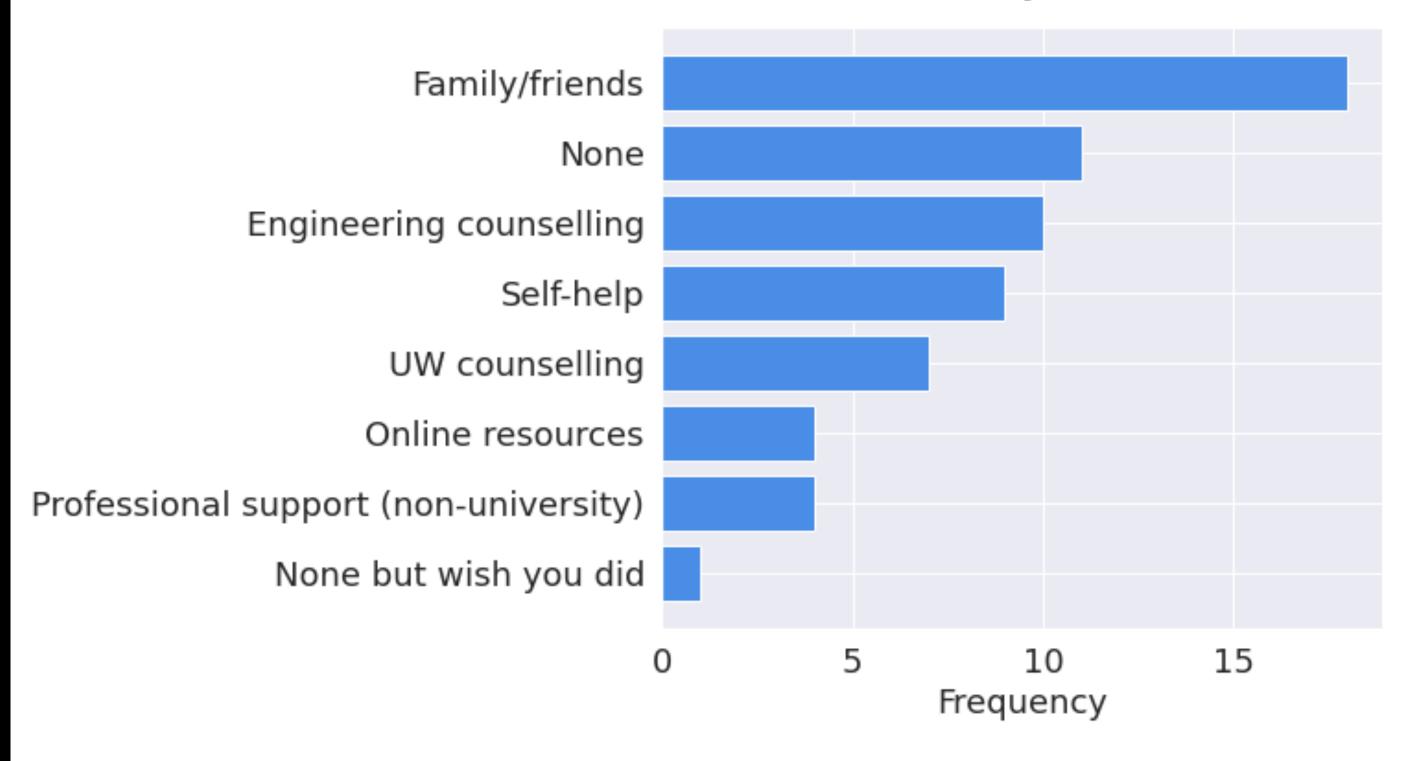
Did you seek mental health support? If so, for what issue?



Respondents felt most comfortable with seeking help from friends and family.

Further research could either focus on how we can best support each other or on potential improvements towards resources offered by Waterloo.

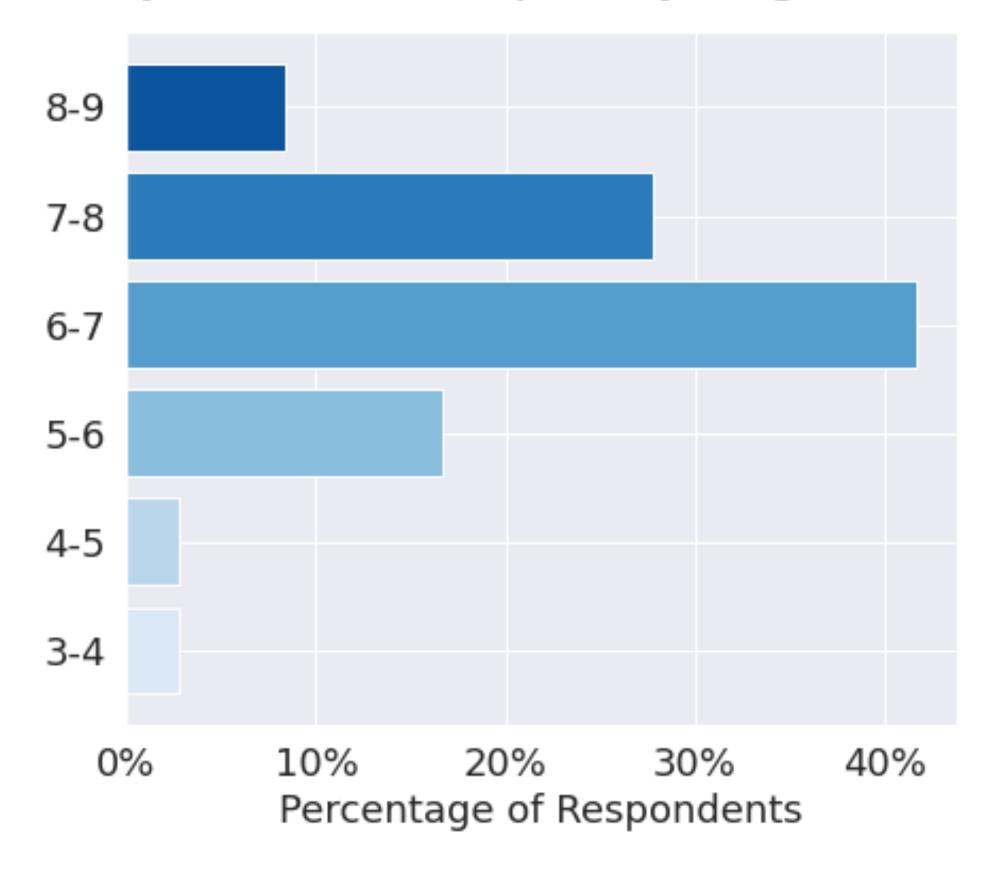
## Which mental health resources did you use?



Respondents slept an average of 6-7 hours.

According to the Center for Disease Control and Prevention, adults 18-60 should be getting **seven**or more hours of sleep every night.

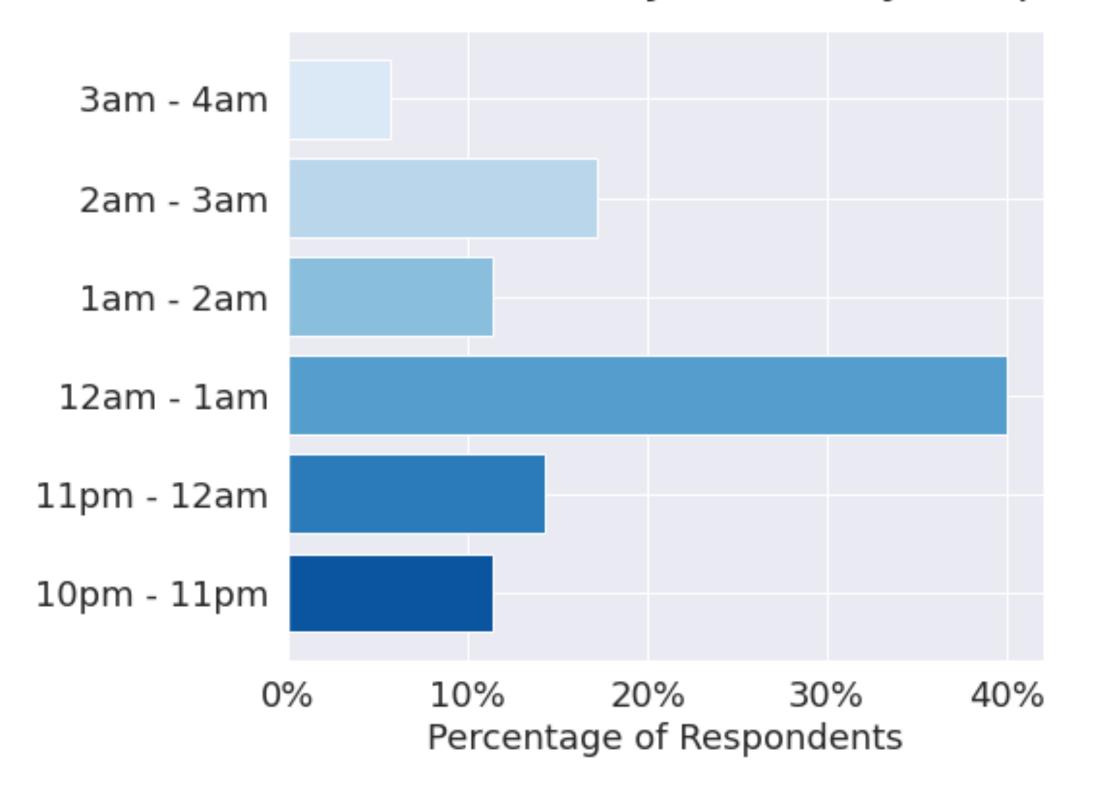
How many hours of sleep did you get on average?



Most respondents hit the bed around 12AM-1AM.

Somewhat concerning, 2am-3am was the second most popular response.

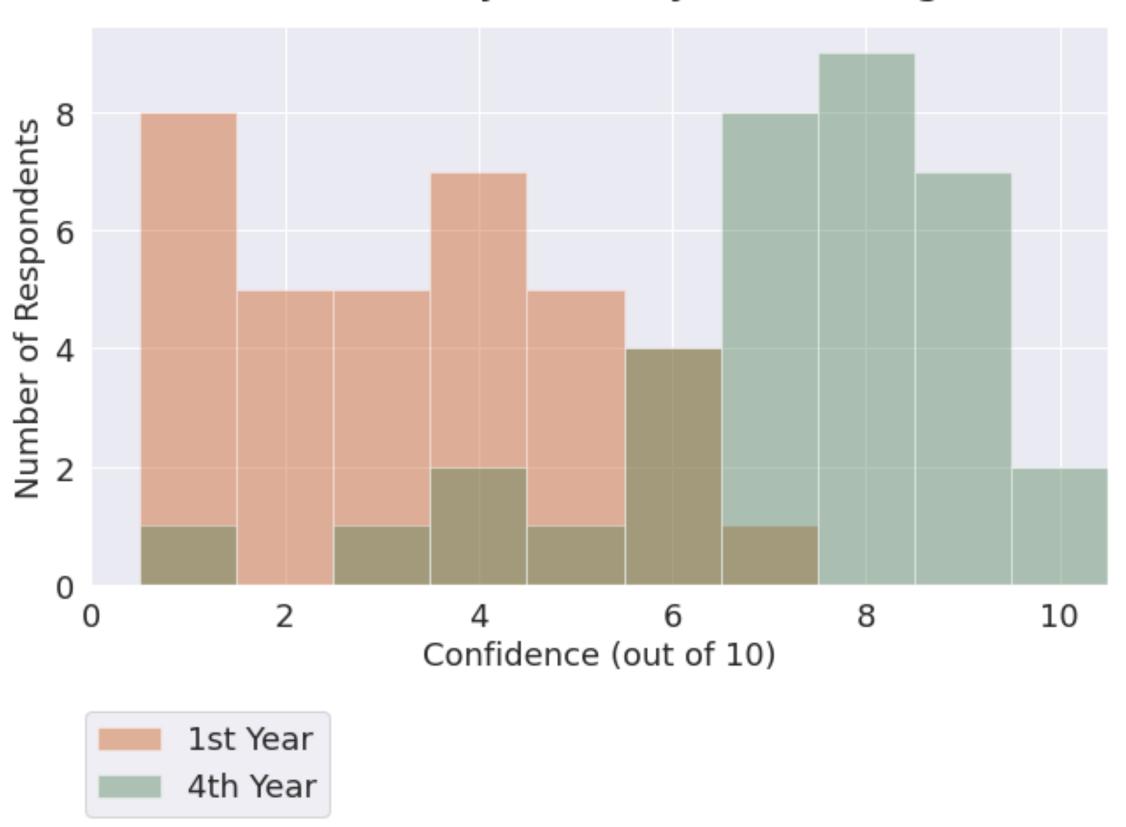
# At what time do you usually sleep?



From cup ramen to Michelin stars.

Perhaps we need a cookoff at our next reunion.

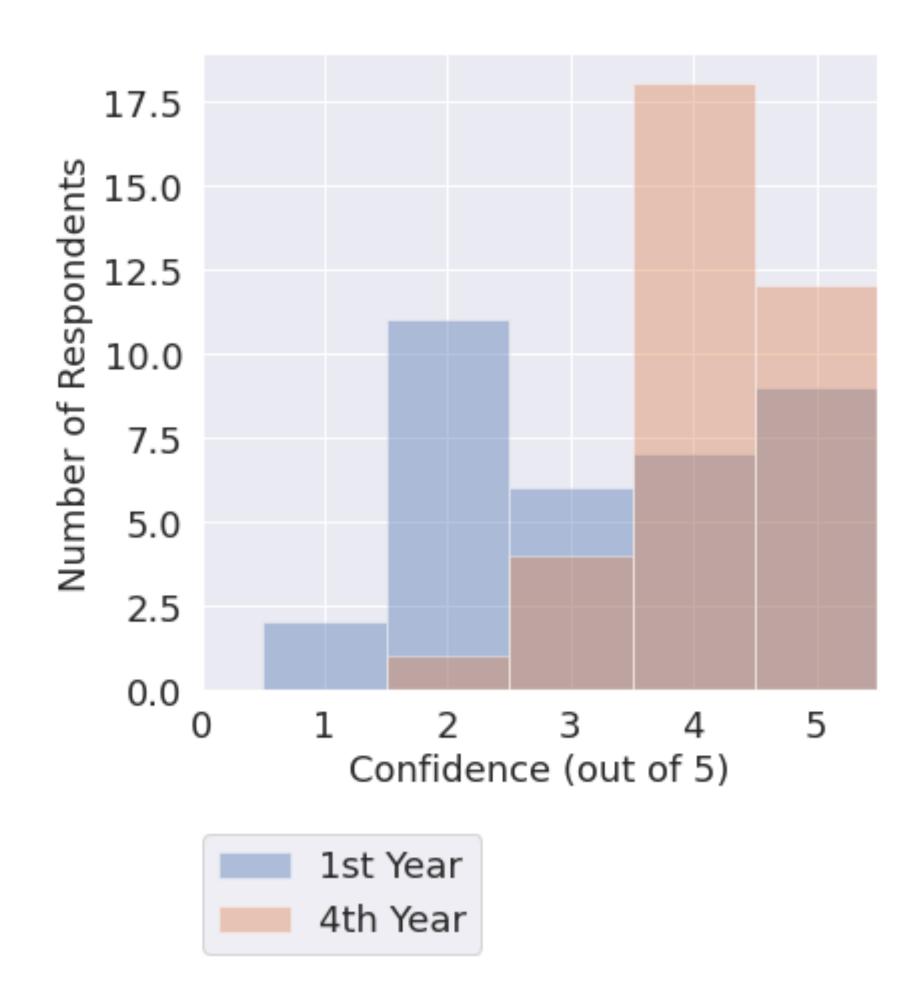
# How would you rate your cooking?



Average confidence towards mental health increased from 3.3 to 4.2.

Respondents feel more resilient after their UW experience.

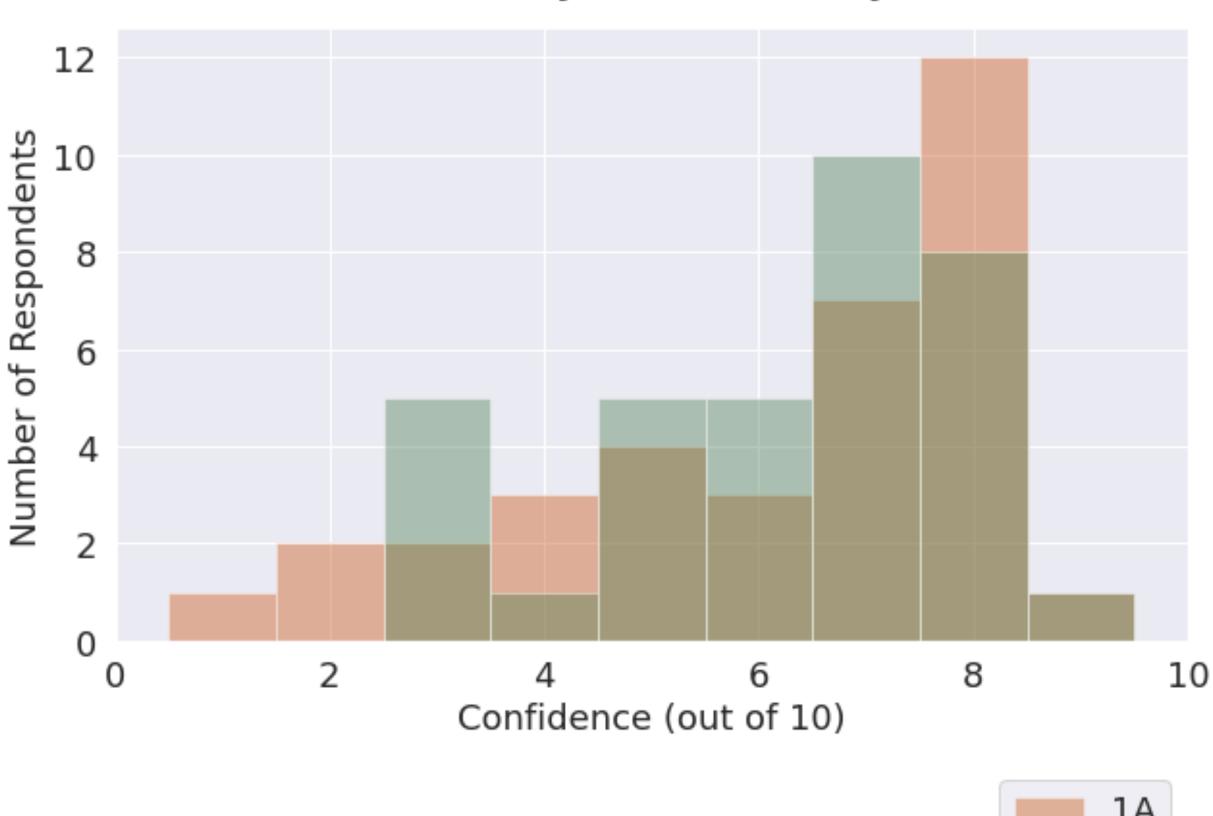
How would you rate your confidence towards your mental heath?



Most respondents left UW feeling more athletic than when they began.

At the same time, however, several fit respondents noted a decrease in athleticism.

# How fit would you describe yourself?



Demographics

Academics

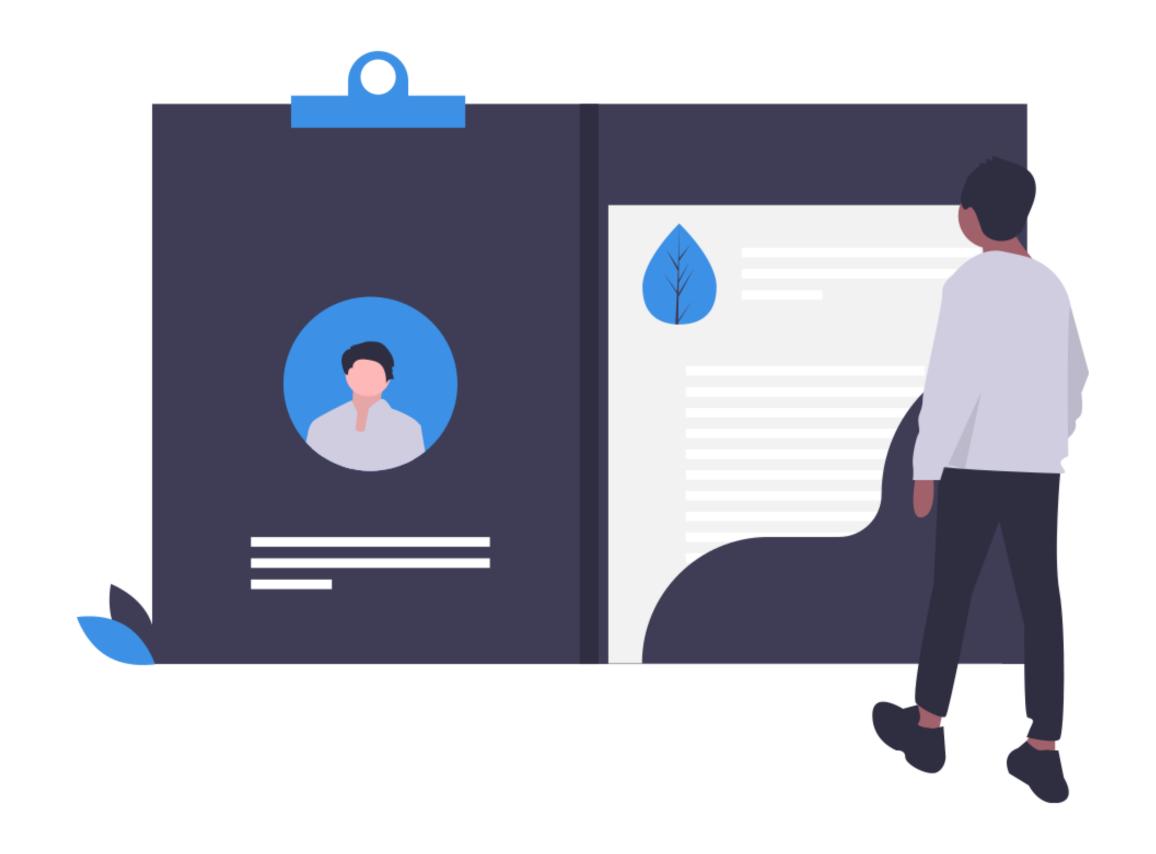
Waterloo Experience: Social

Health at UW

# • Co-op Experience

Future: Finances + Career

Future: Reflection

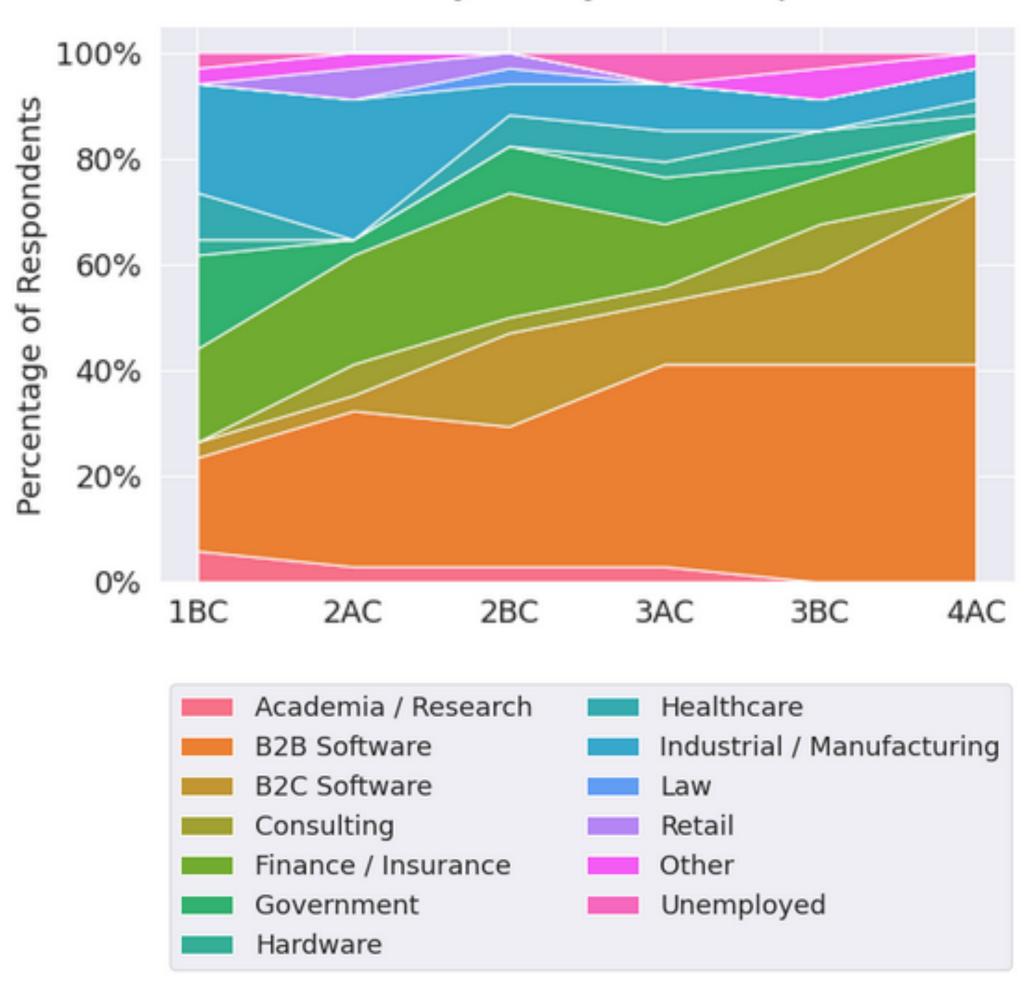




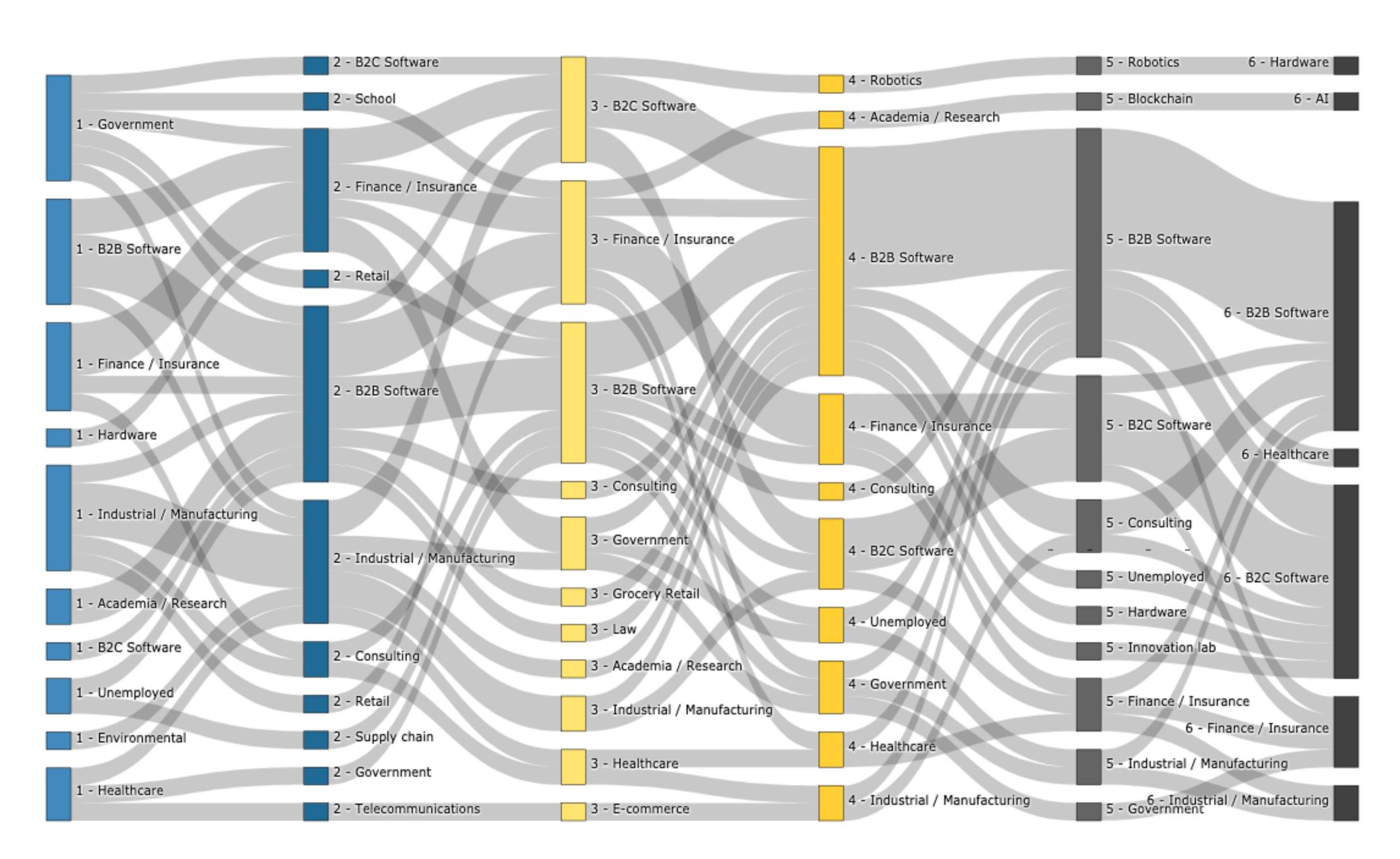
of respondents did their last co-op in the Software Industry

Roles in both Government and Manufacturing became less popular as students' careers progressed.

## What industry was your co-op term in?



#### Co-op Industry Progression

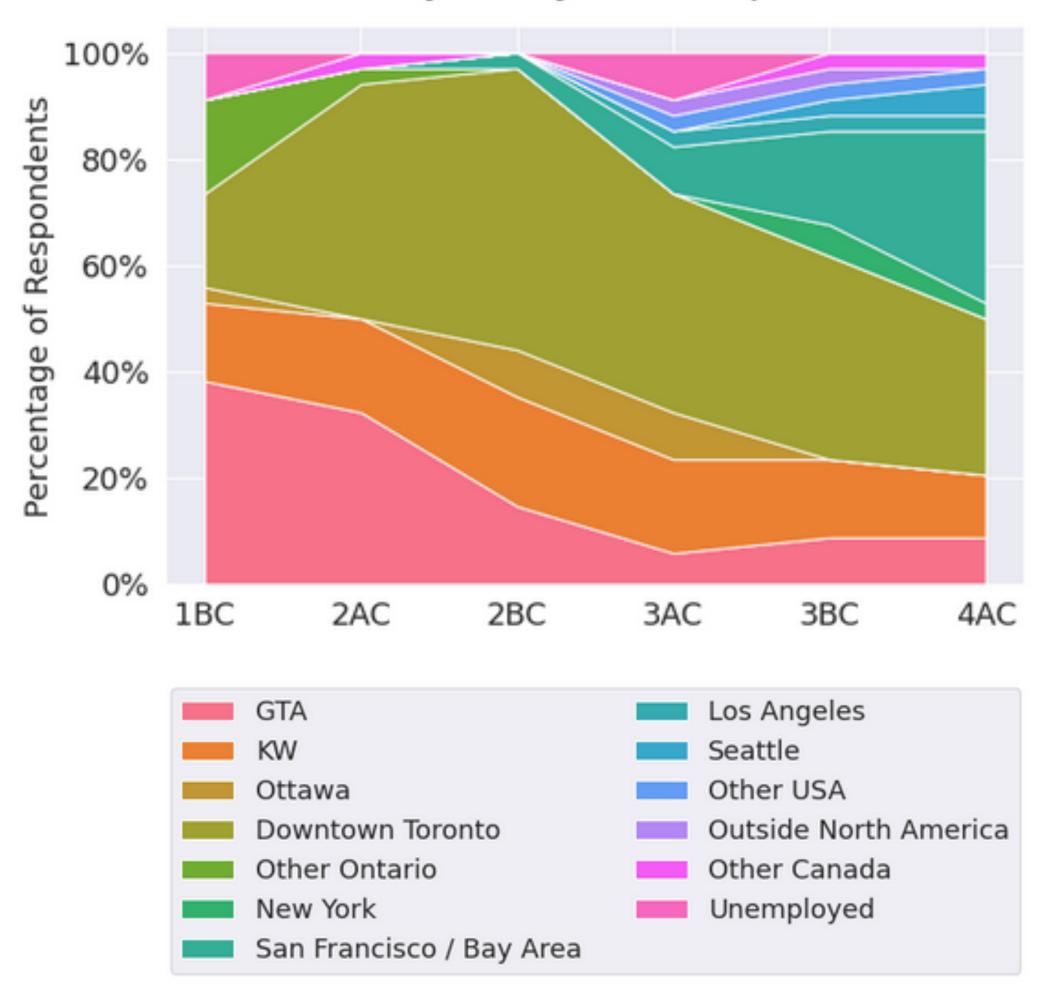


~53%

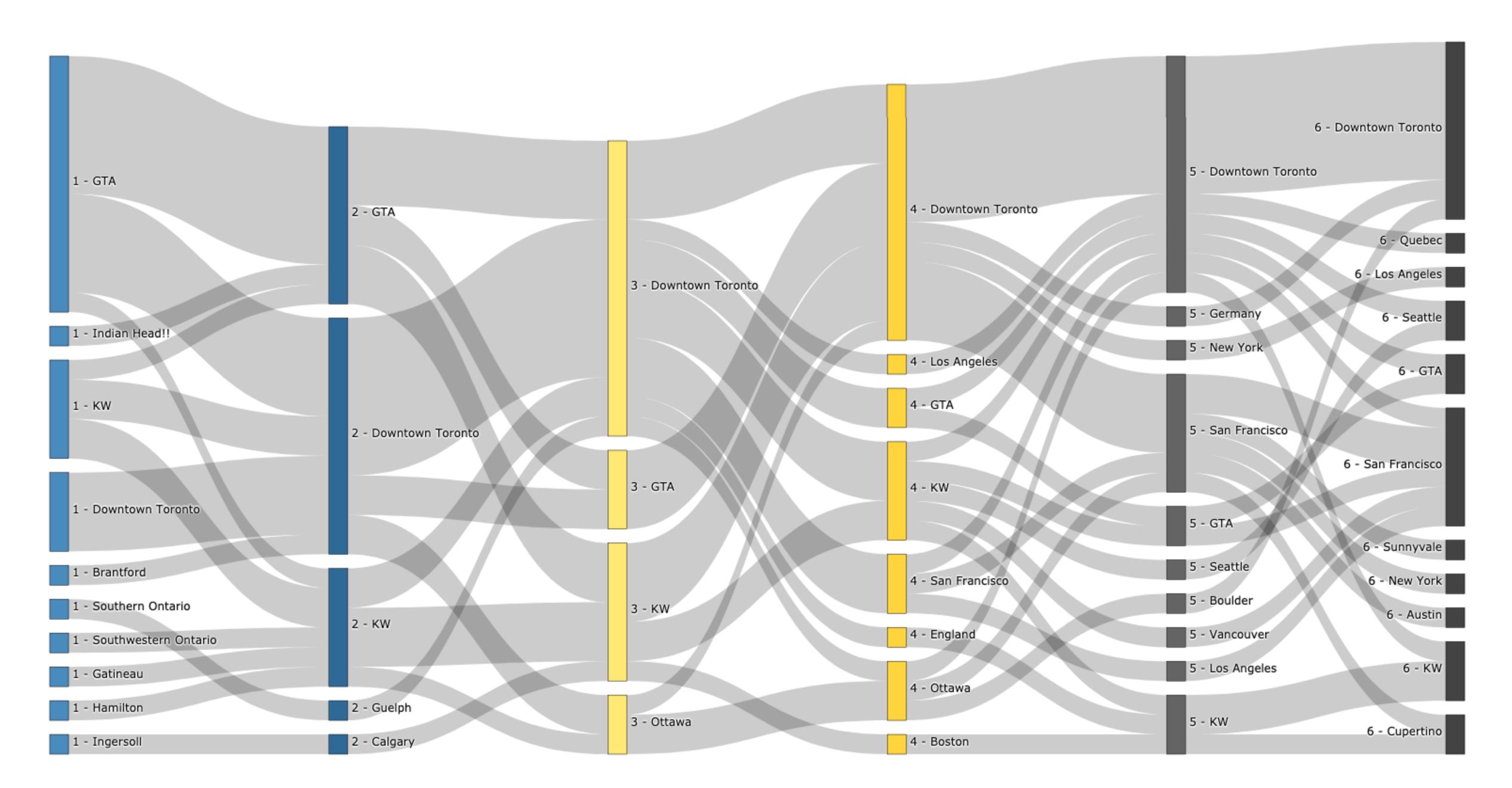
Of respondents did at least one coop in the United States

Other notable international locations include England, Germany, and Tokyo.

# Which city was your co-op term in?



## Co-op Location Progression



developers.

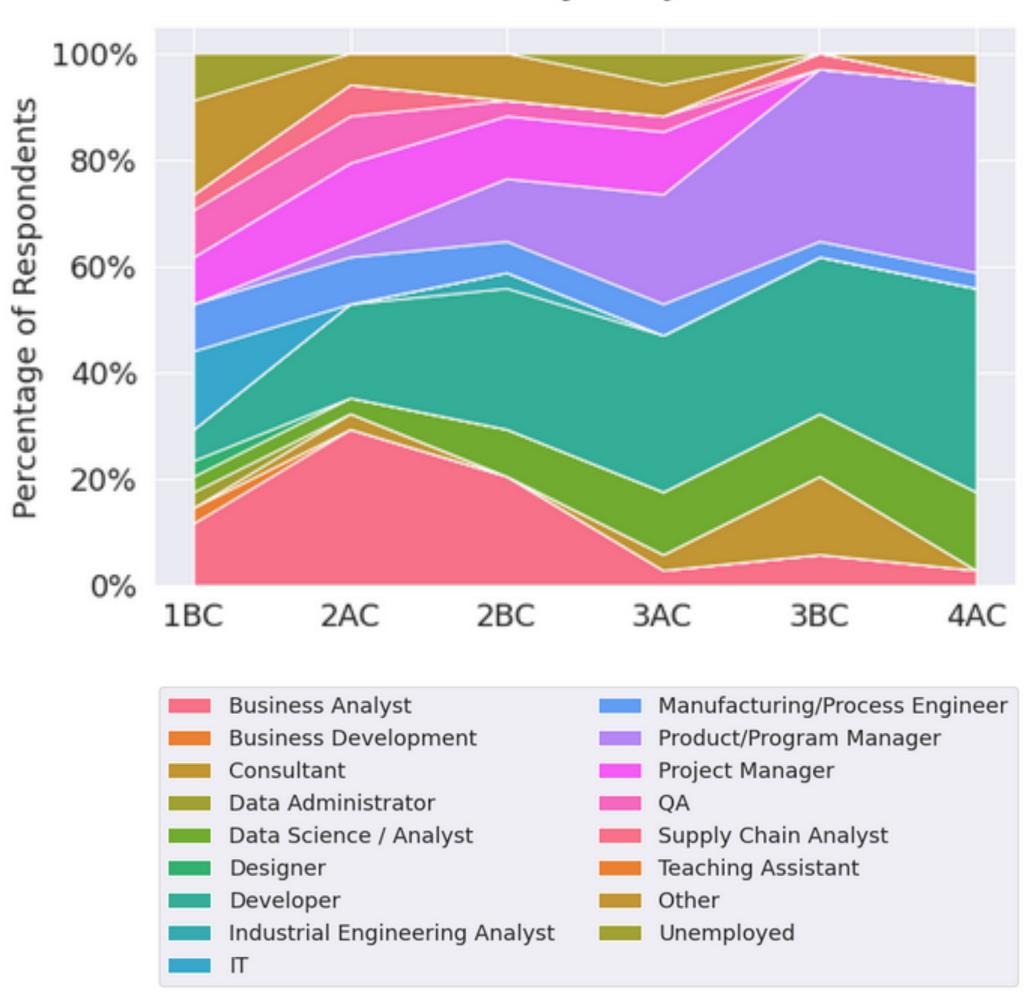
Developers.

DEVELOPERS.

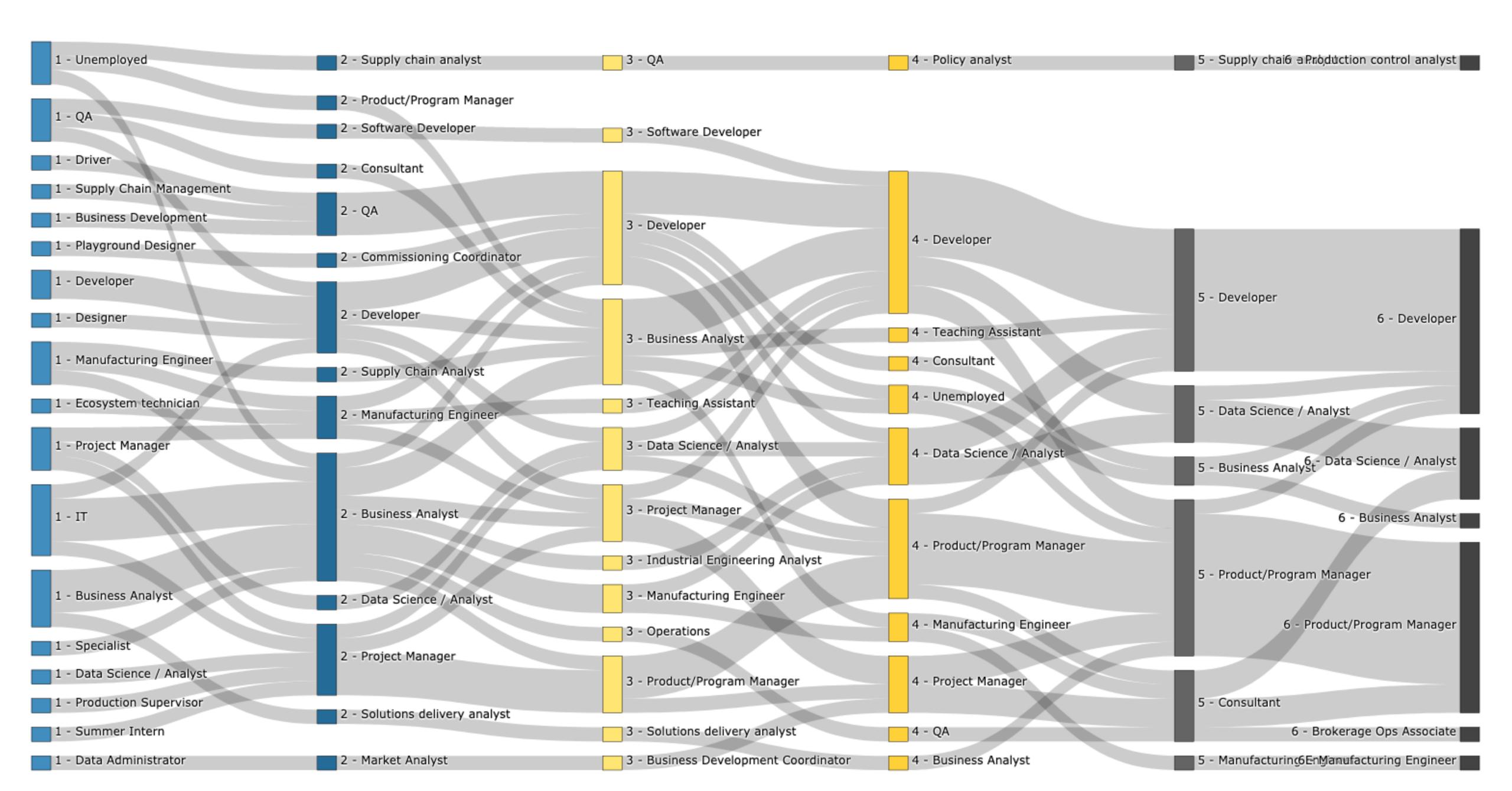
DEVELOPERS.

By the 6th co-op, job titles of 'Developer' and 'Product/Program Manager' accounted for 74% of all co-op roles.

# Which was your job title?



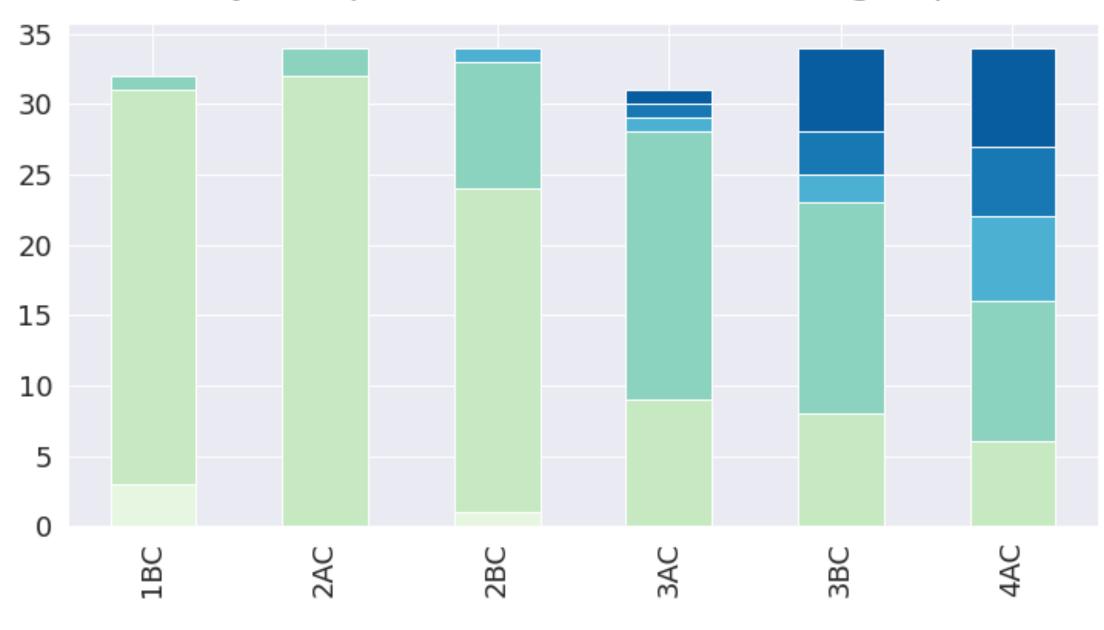
## Co-op Title Progression

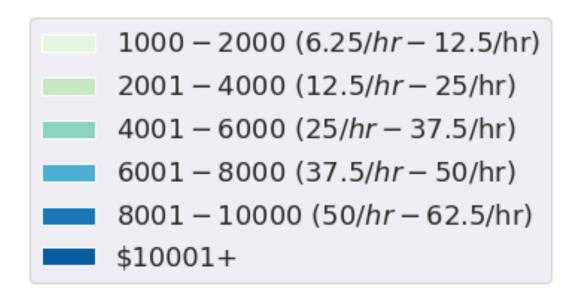


By the 6th co-op, we had classmates making more than \$62.5 CAD an hour

As we grew up, the amount we were making increased greatly.

## Monthly Compensation in CAD (Excluding Stipends)





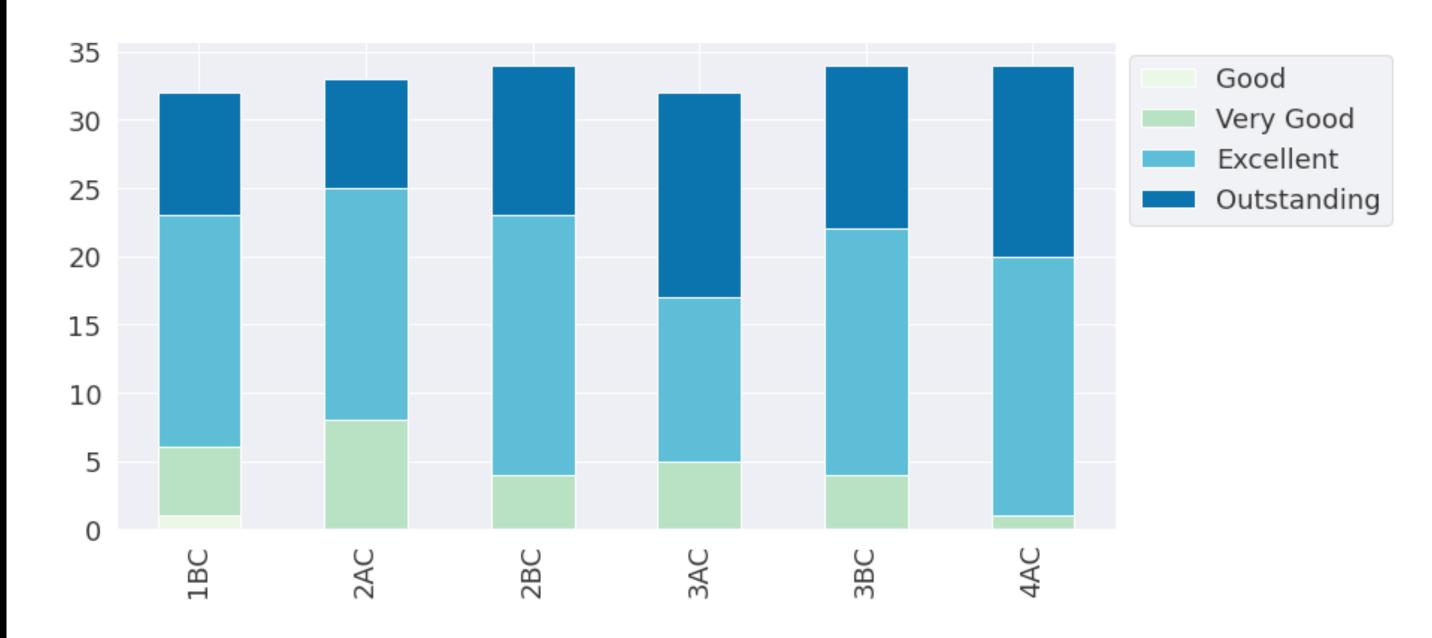
35%

of all co-op evaluations were awarded "Outstanding"

93.5% of Waterloo co-op students get "Very Good" or above.

99% of Management Engineering 2020 respondents got "Very Good" or above.

# What evaluation did you receive?



By the 4th co-op, most respondents could see themselves happy with doing the job full time.

Only one respondent could not see themselves being happy with doing their 6th co-op job full time.

## Could you see yourself being happy with doing this job full time?



Demographics

Academics

Waterloo Experience: Social

Health at UW

Co-op Experience

• Future: Finances & Career

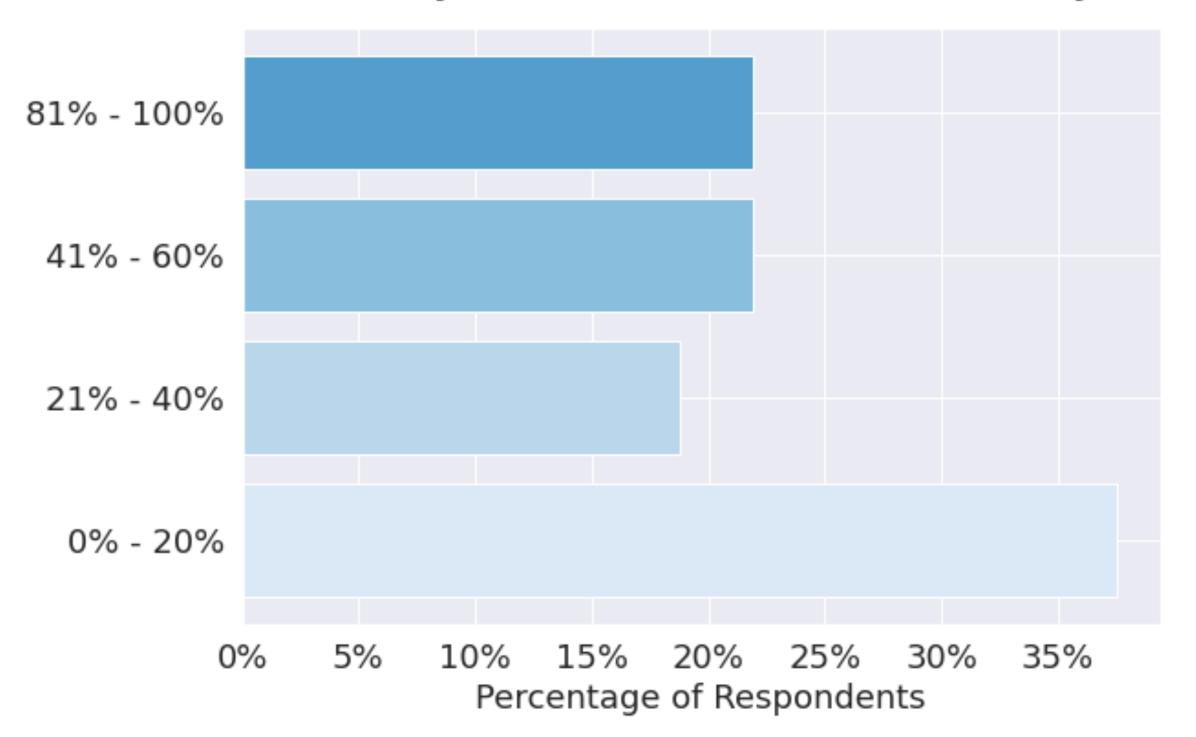
Future: Reflection





of our class paid for at least half their education

## How much of your education was funded by family?

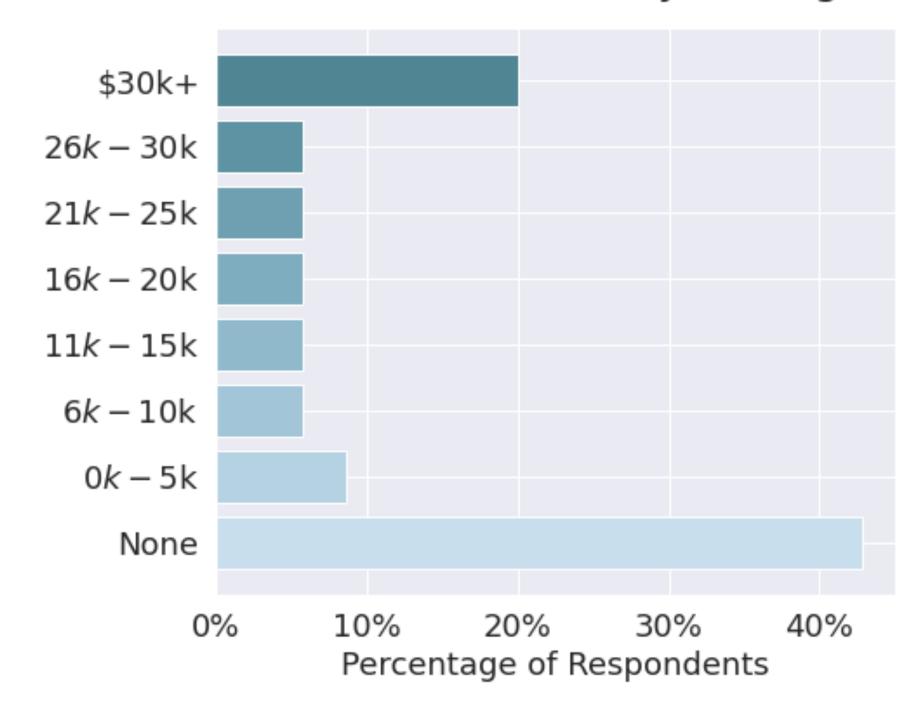


45%

of students won't have any debt once they graduate

Thank you coop!!!

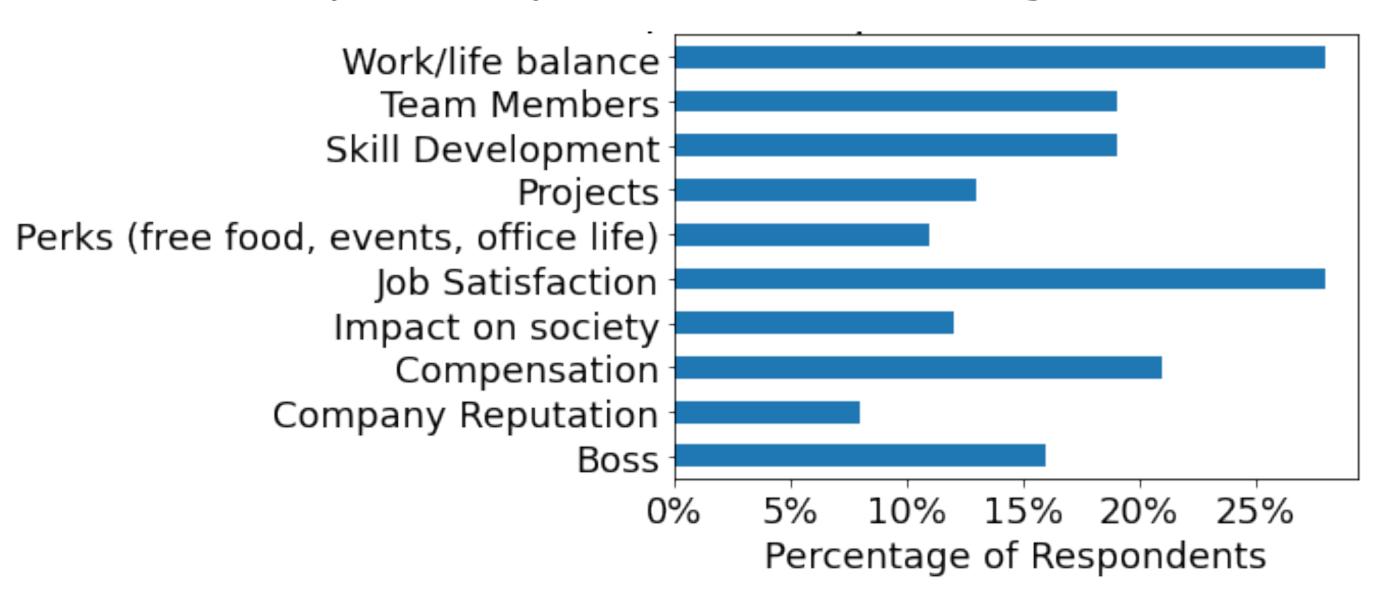
### What amount of student debt will you be graduating with?



Work/life balance and job satisfaction were the most important aspects in a job.

The company reputation and perks weren't nearly as important as being happy at work, what we're working on and who we're working with.

## Aspects important in a full time job

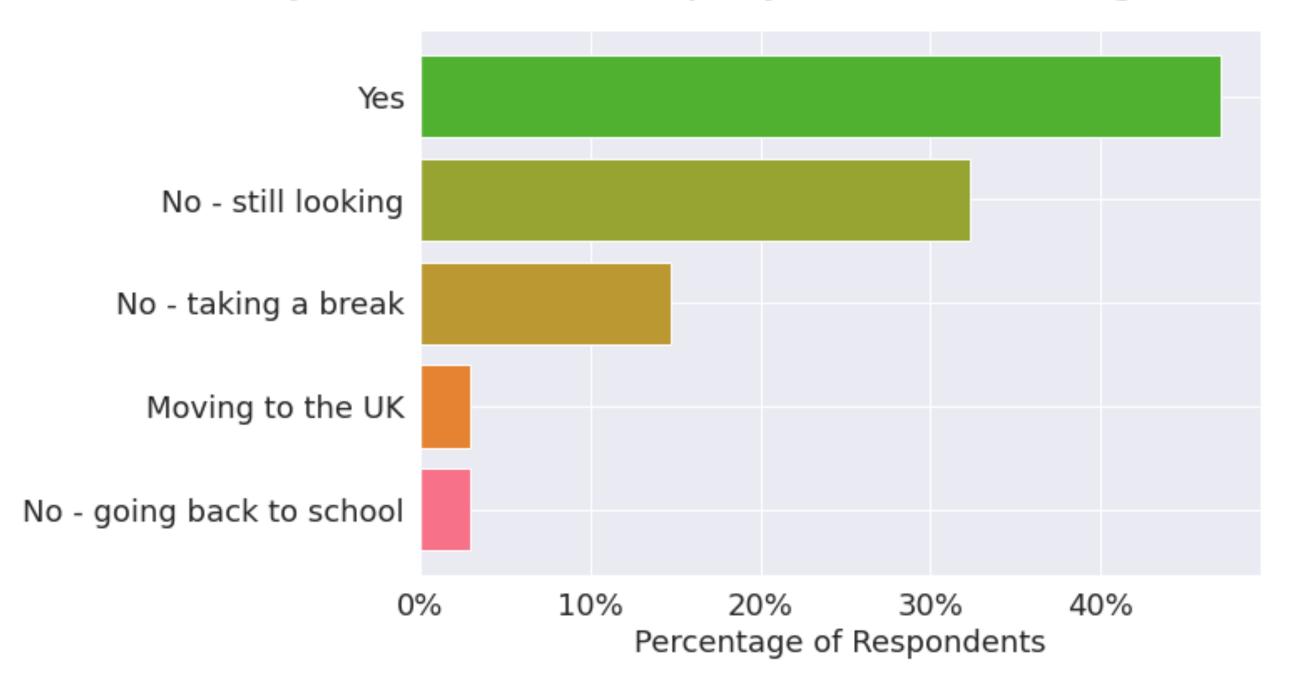


of our class have jobs lined up postgraduation.

Only 3% said they were going back to school.

Most are either starting work or looking for a job!

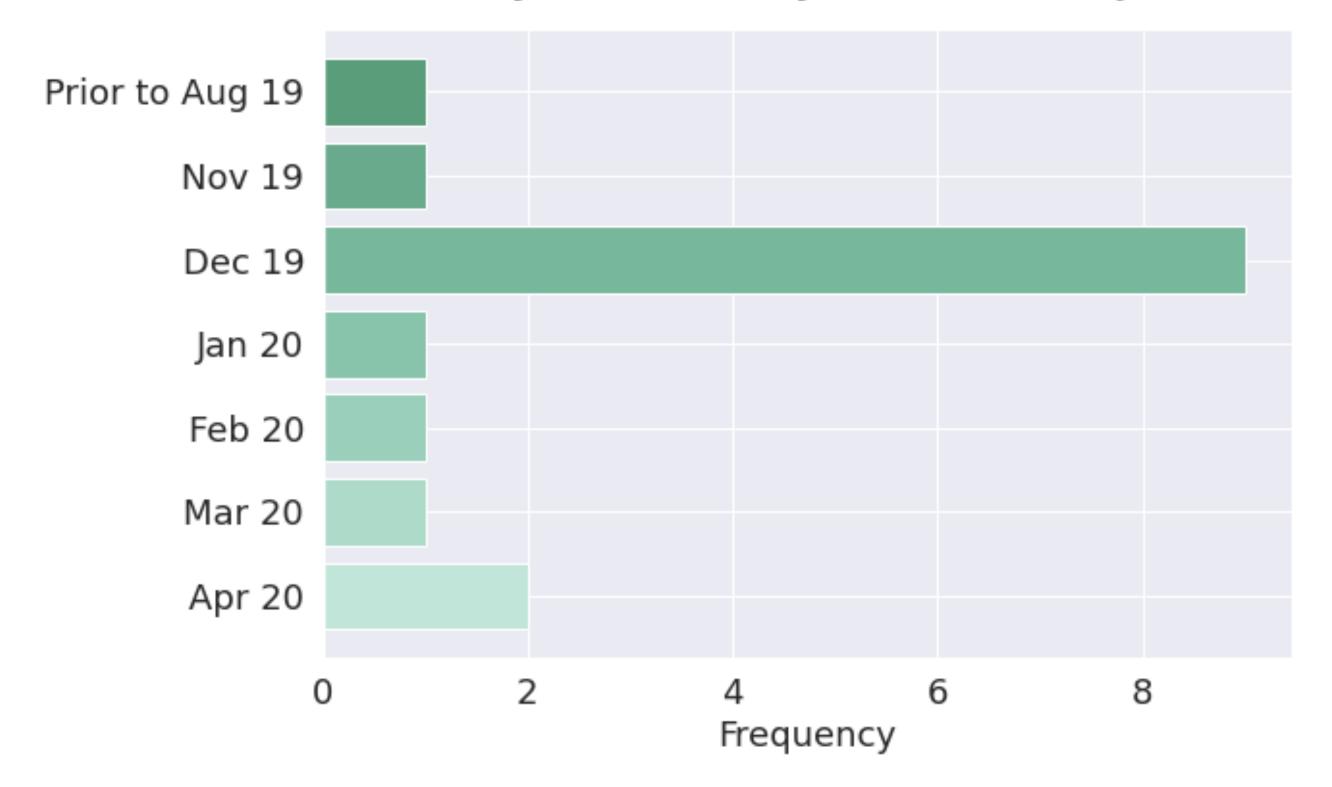
#### Do you have a full-time job you will be starting in 2020?



of existing full-time offers were received in December 2019

This coincides with the end of our last co-op term. At the same time, however, full time offers seemed to trickle in throughout the spring.

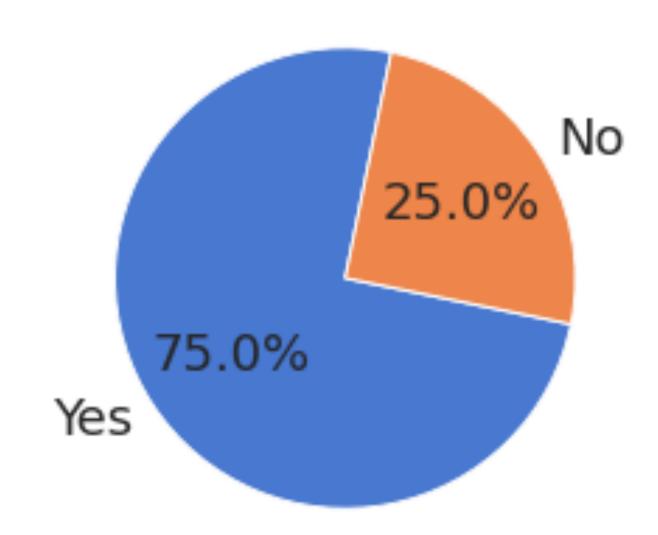
## When did you receive your full time job offer?



of those that have jobs are at companies that they had a co-op at

Considering potential employers' full time conversion routes is something to keep in mind for the last couple co-ops.

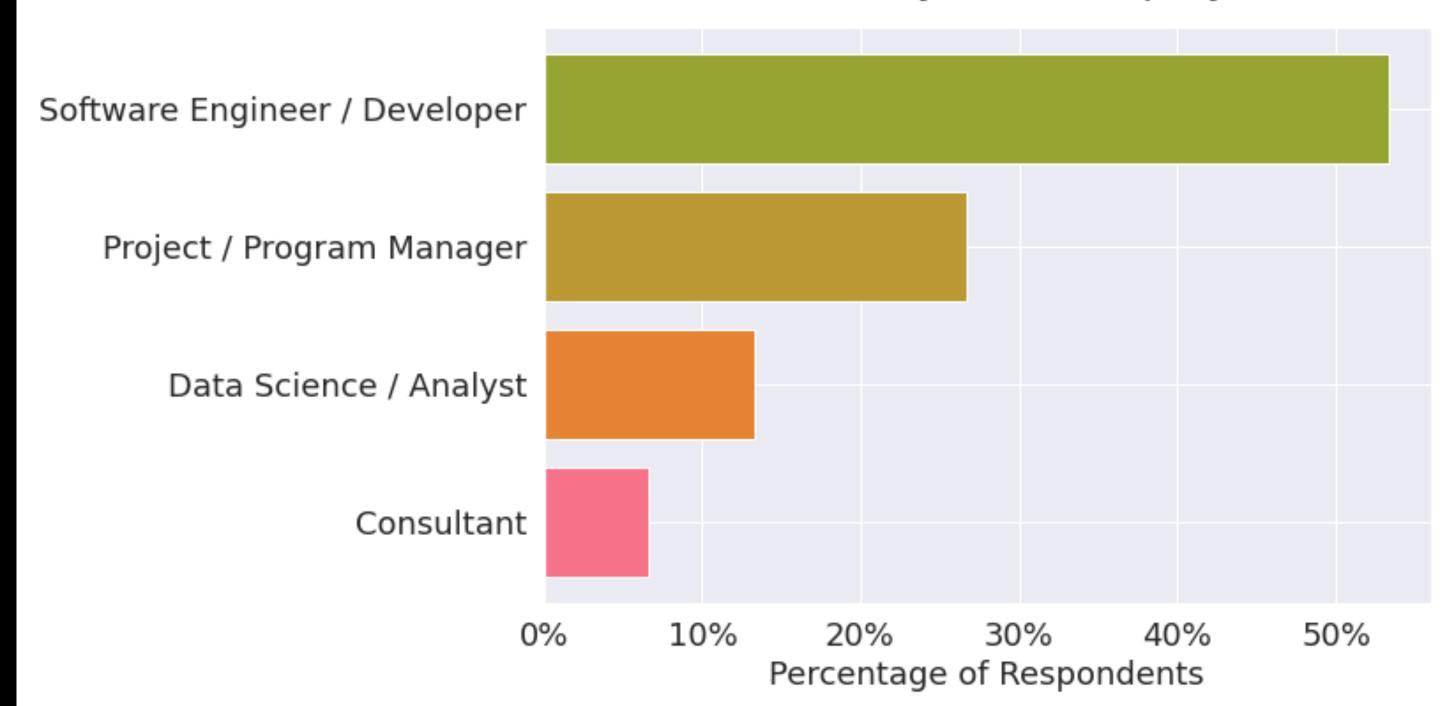
Will you be working for a company you had a co-op at?



The most common job title is Software Engineer / Developer.

A class of many talents, our full time jobs showcase our diverse skills, from software developers to project, product, program managers to data science and consultants.

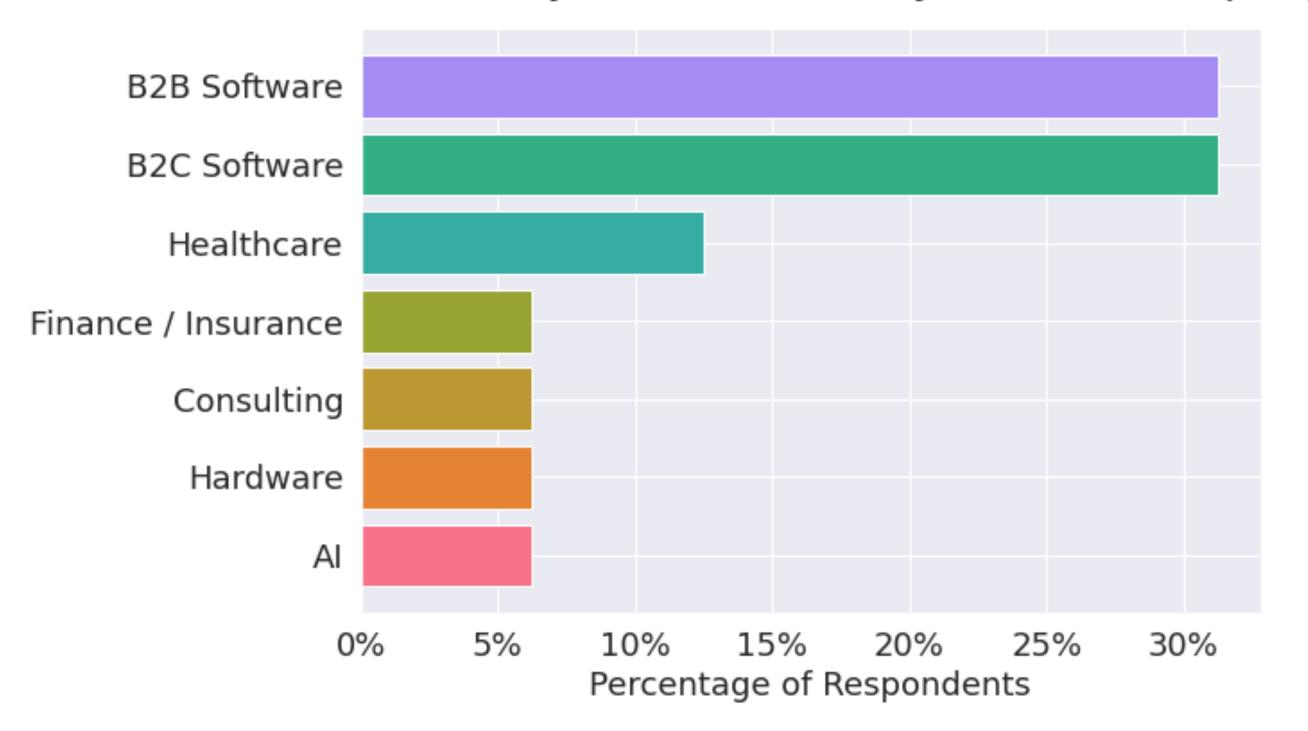
## What role will you be employed in?



Software / Technology industry is the most common with 62% of the class working in it.

Tech seems to be where most full time offers came from.

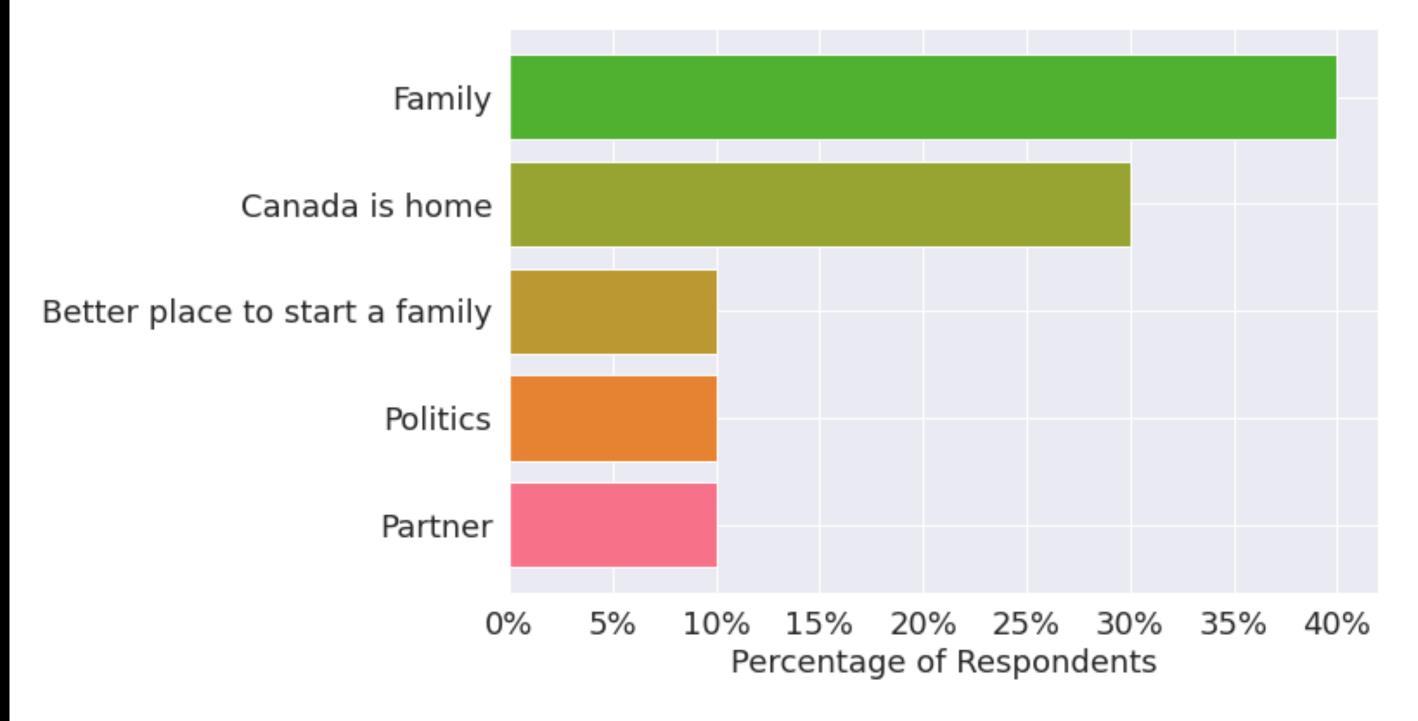
## What industry best describes your next company?



Family is the most common reason for returning to Canada, at 40%.

Home is where the heart is, and where the family is.

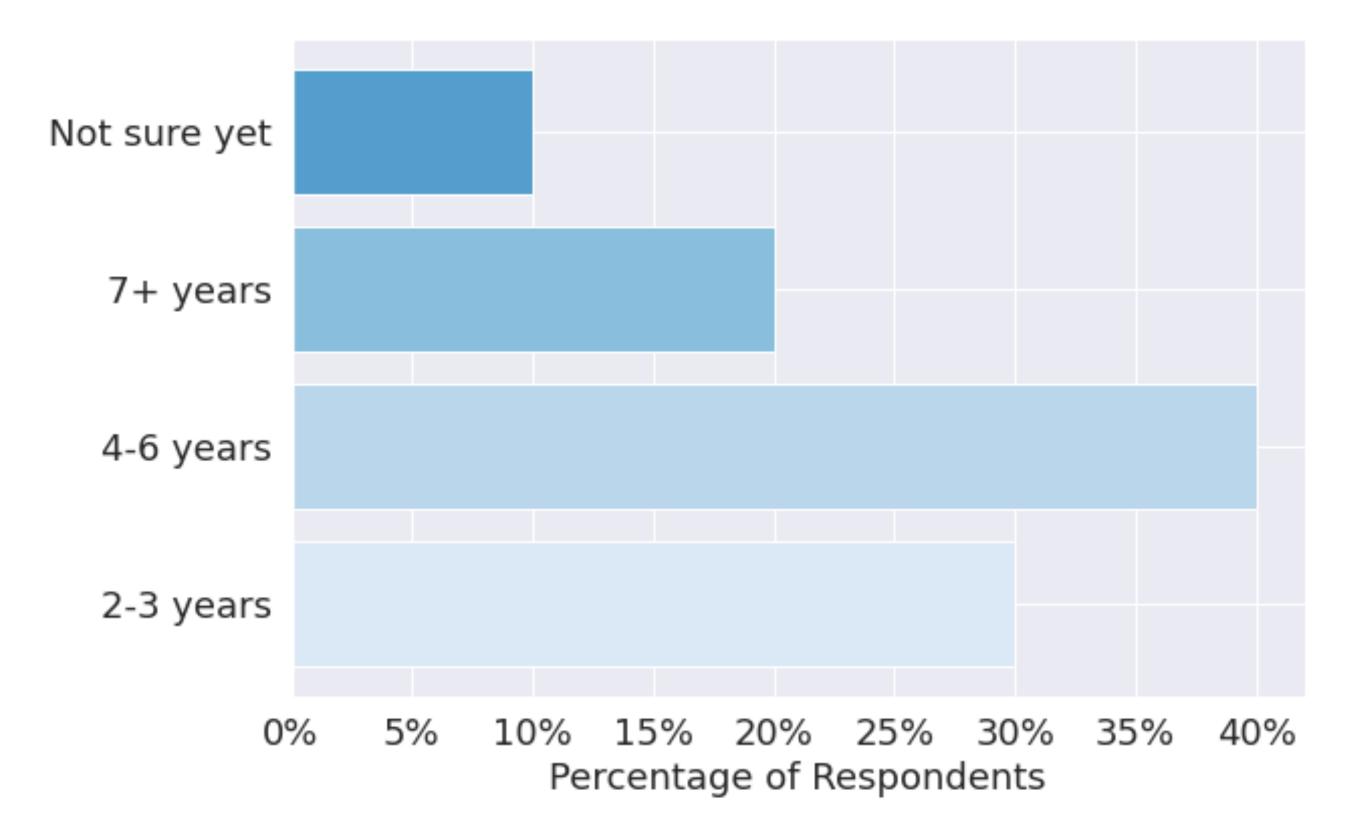
If your job is outside of Canada but you see yourself returning, why?



4-6 years is the most common expected time to stay in the US for.

No one is planning to go for just a year and come back, some are gonna be there more than 7 ?

If your job is outside of Canada, when do you plan on returning?



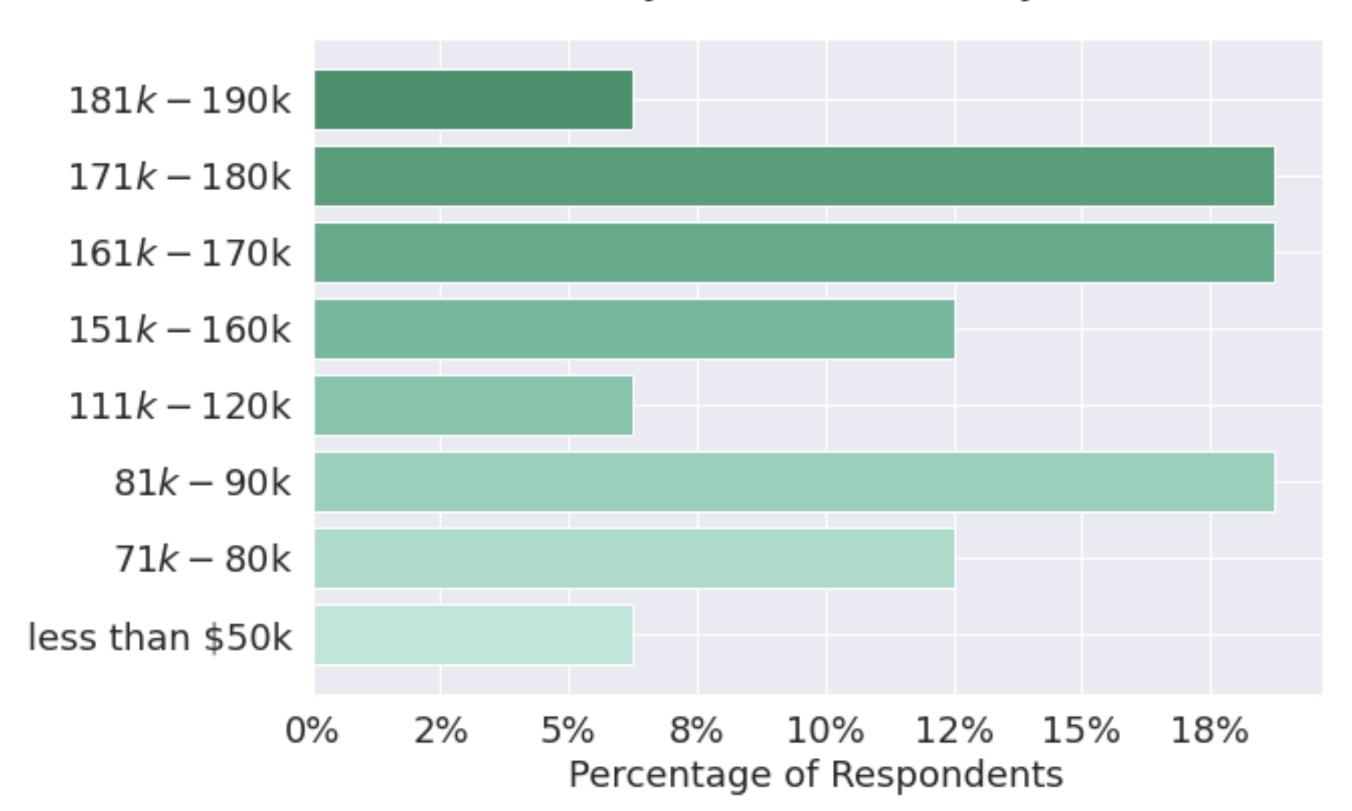
# ~\$130K

is the average salary, in CAD.

38% are making more than \$161k CAD.

As per the 2016 Canadian census, the 99th income percentile (i.e. top I percent) for 23 year olds is \$87,884. The 99th income percentile for 27 year olds is 128k.

#### What will be your annual salary (in CAD)?



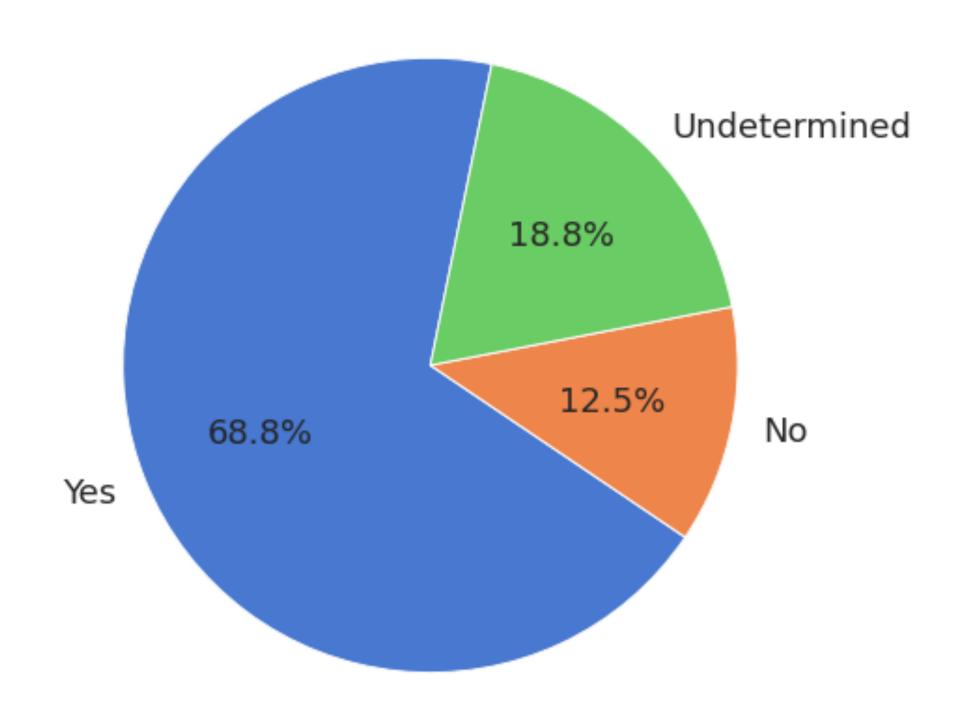
68.8%

of full time offers included some form of stocks / equity.

Folks, if you've signed your contract and its undetermined, I feel like thats a no.

It's quite possible we were unclear with our question.

## Were you offered equity or stocks?

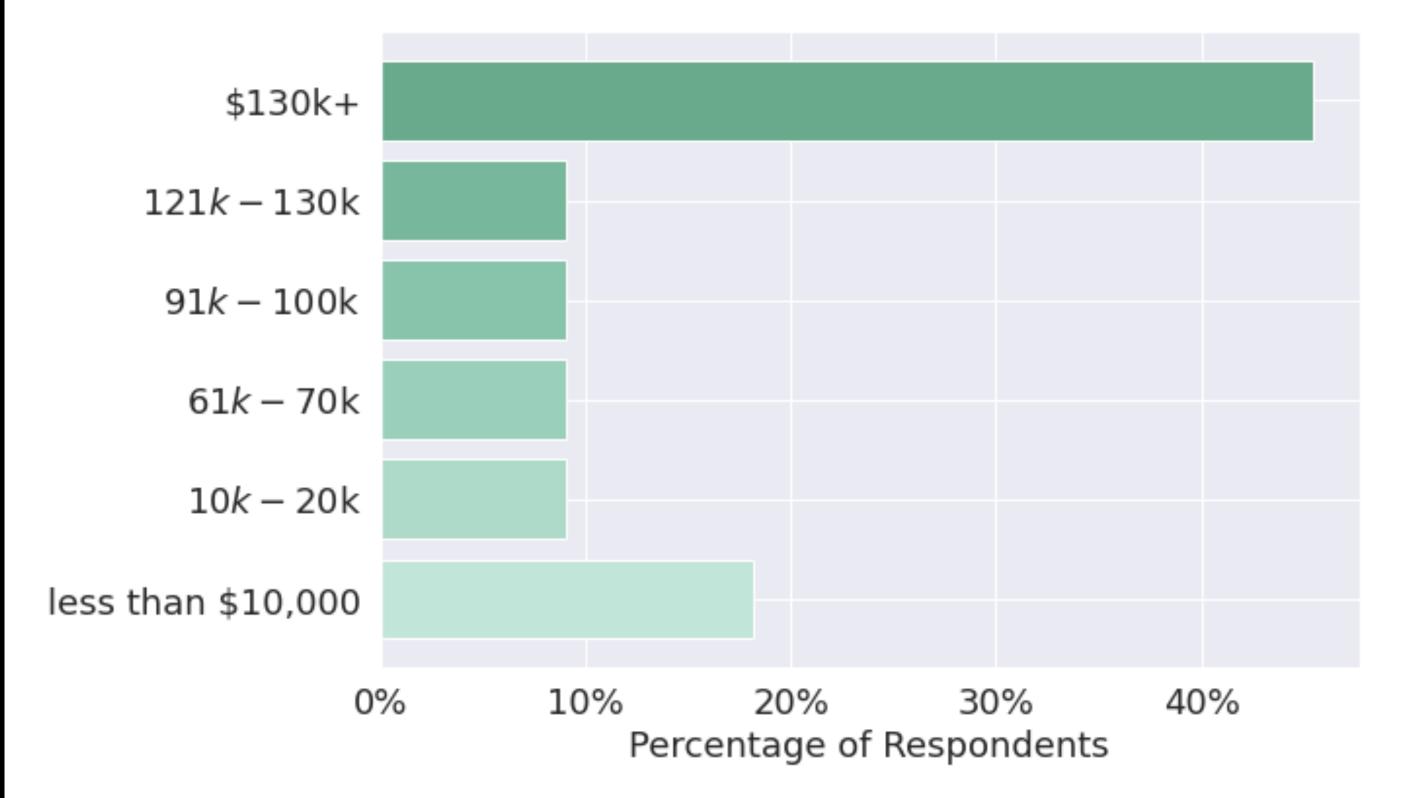


# 130 4

was the most common amount of equity/stocks offered

Clearly, we messed up this range. We did not expect the amount to be so high!

If yes, how much equity or stocks were offered (in CAD)?

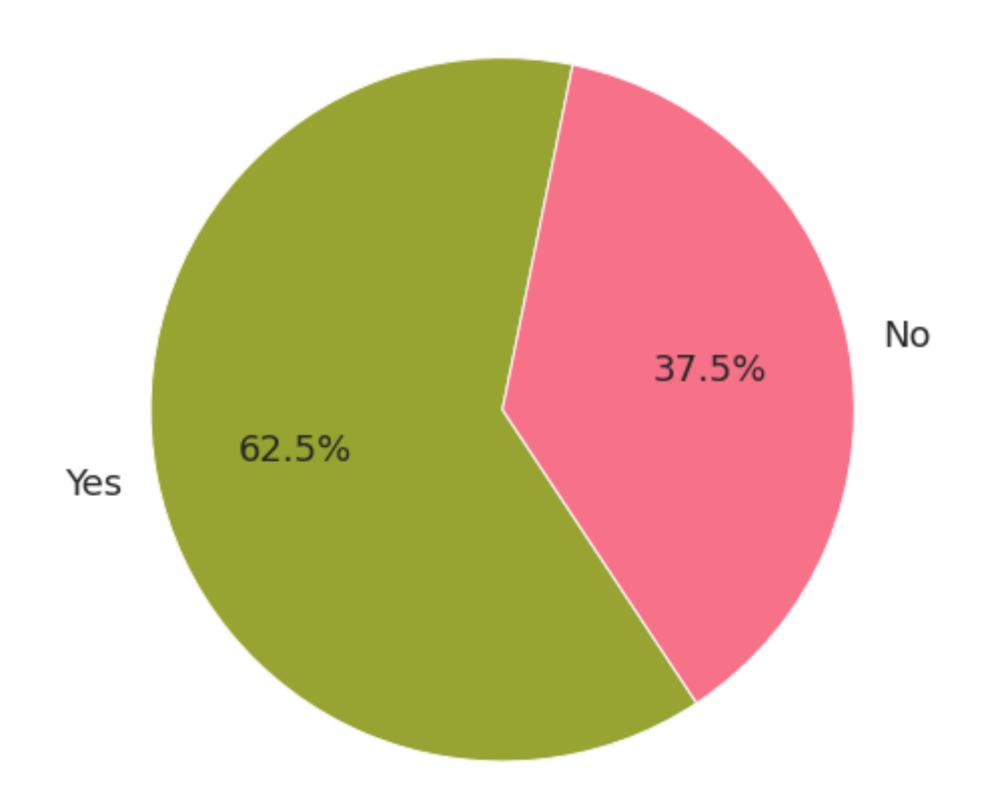


63%

of full time offers included a signing bonus

Some offers came with relocation bonuses and assistance.

## Were you offered a signing bonus?

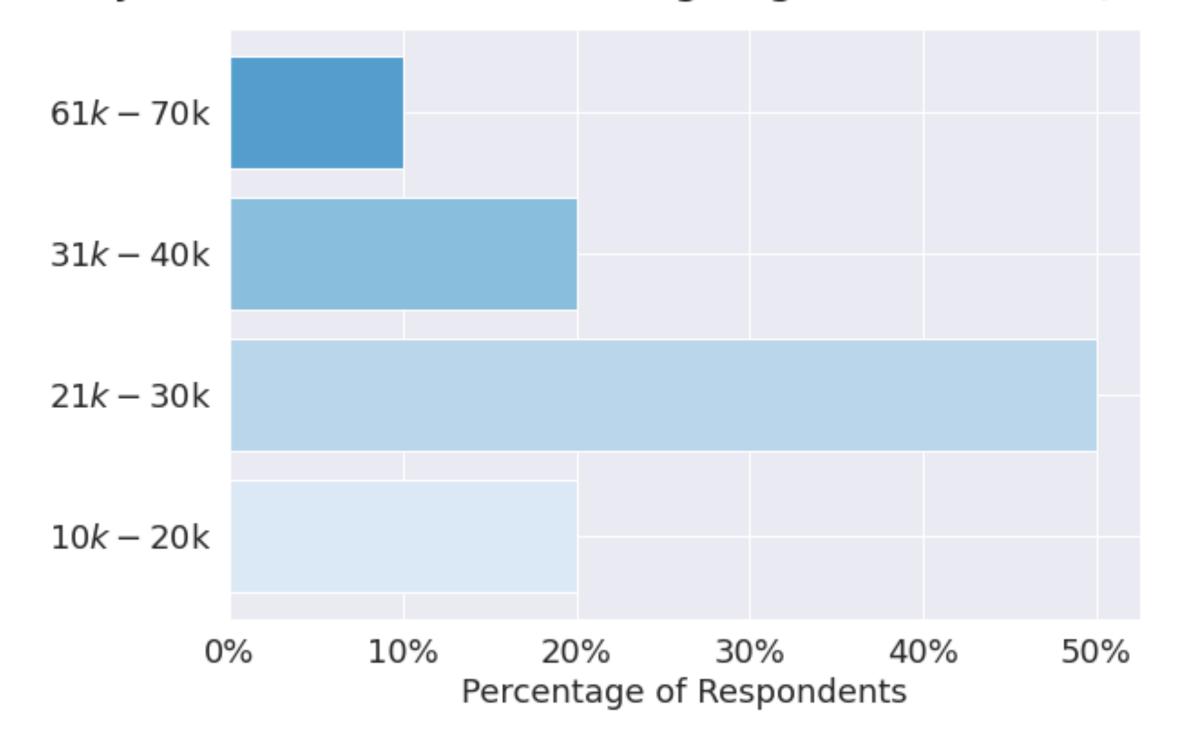




was the most common signing bonus offered

From those that were lucky to get one.

If yes, how much was the signing bonus worth (in CAD)?



Academics Pre-Uni

Academics in University

Waterloo Experience: Social

Health at UW

Co-op Experience

Future: Finances & Career

Future: Reflection

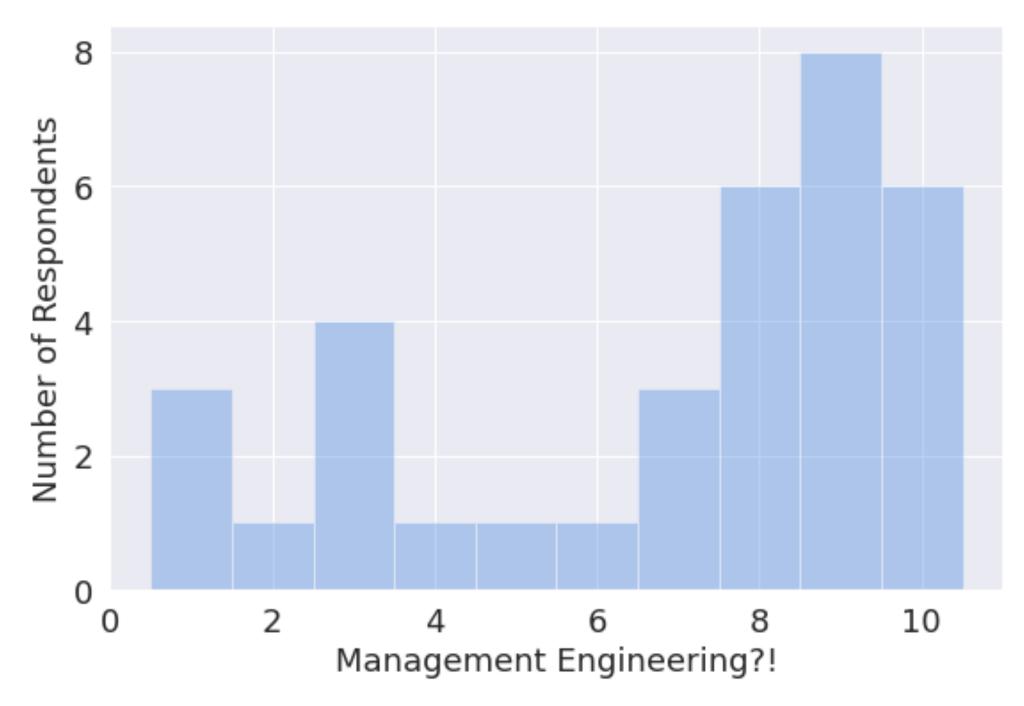




was the average certainty in selecting Management all over again

Even after everything we've been through, most indicated they would choose Management Engineering again if they needed to.

## Would you choose Management Engineering again?

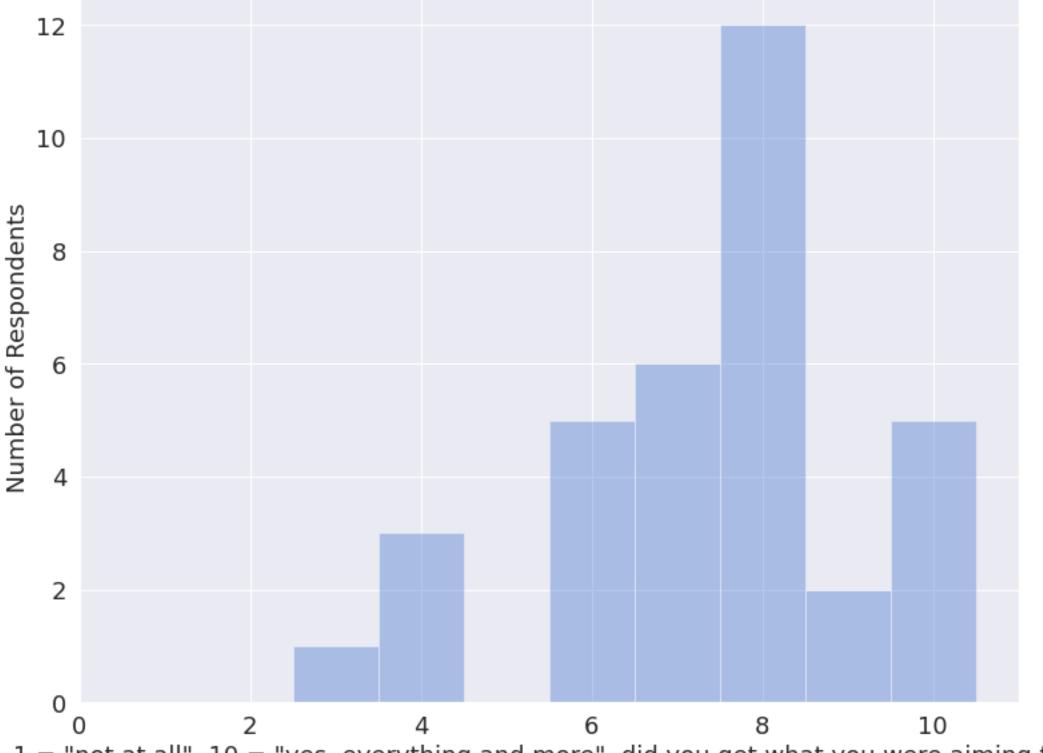


# 7.4/10

was the average response of whether we got what we were aiming for.

We managed to get what we came for.

Did you get what you were aiming for out of management?

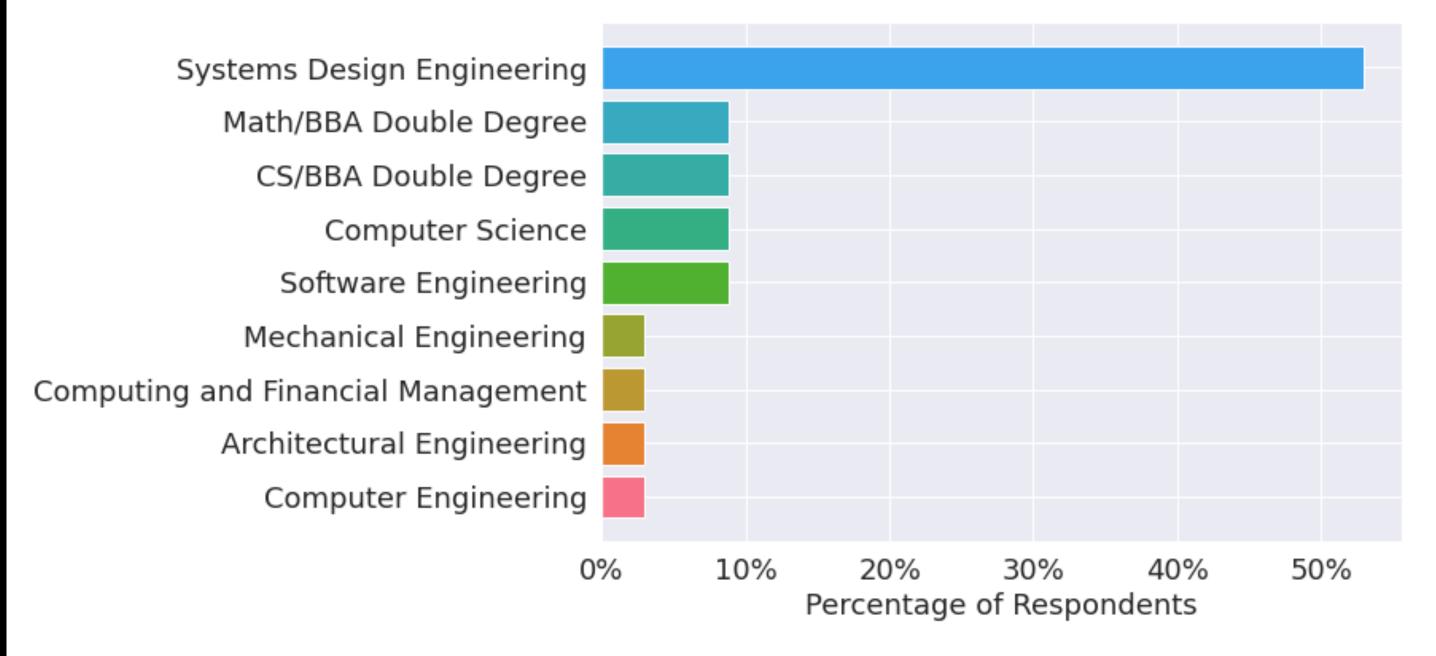


1 = "not at all", 10 = "yes, everything and more", did you get what you were aiming for?

Systems Design
Engineering would have
been the next program we
would end up in.

If we were still at Waterloo, we would have almost all chosen SYDE as an alternative program.

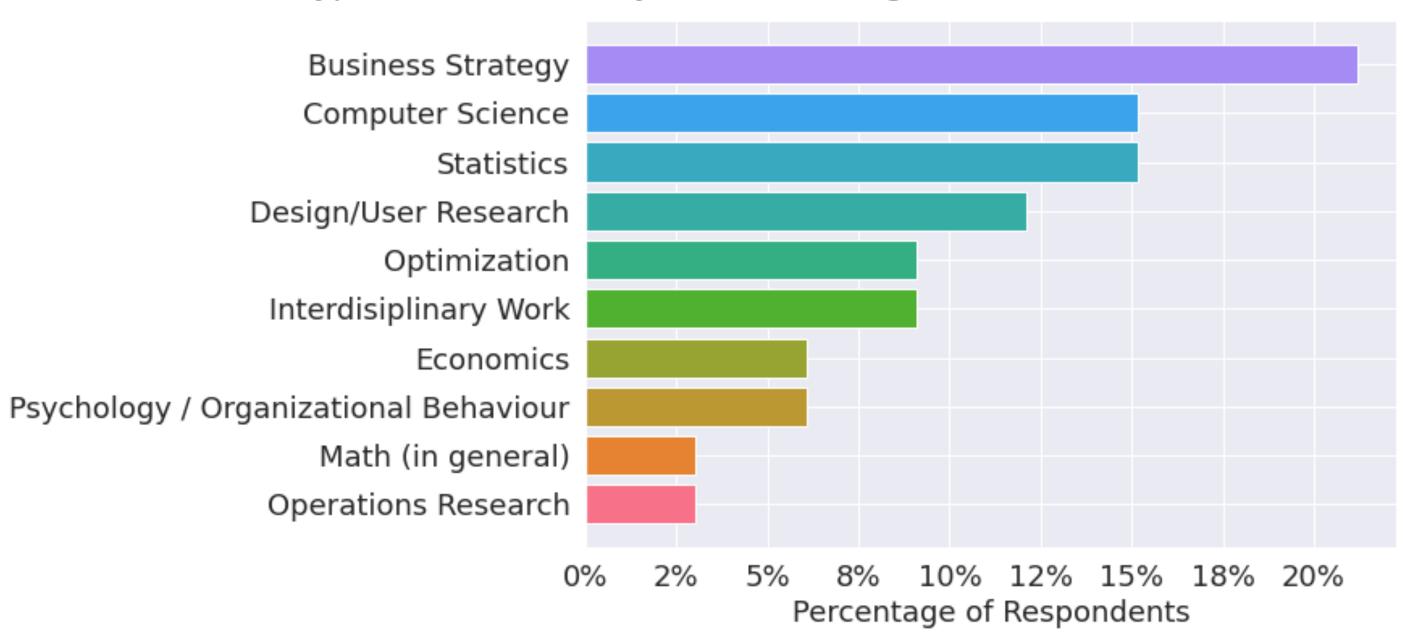
# What program would you have selected at Waterloo if you hadn't done Management Engineering?"



We expected more Business Strategy, Computer Science and Statistics courses in particular.

Apparently we expected more of basically everything. Technical, non-technical. Mathematics, business.

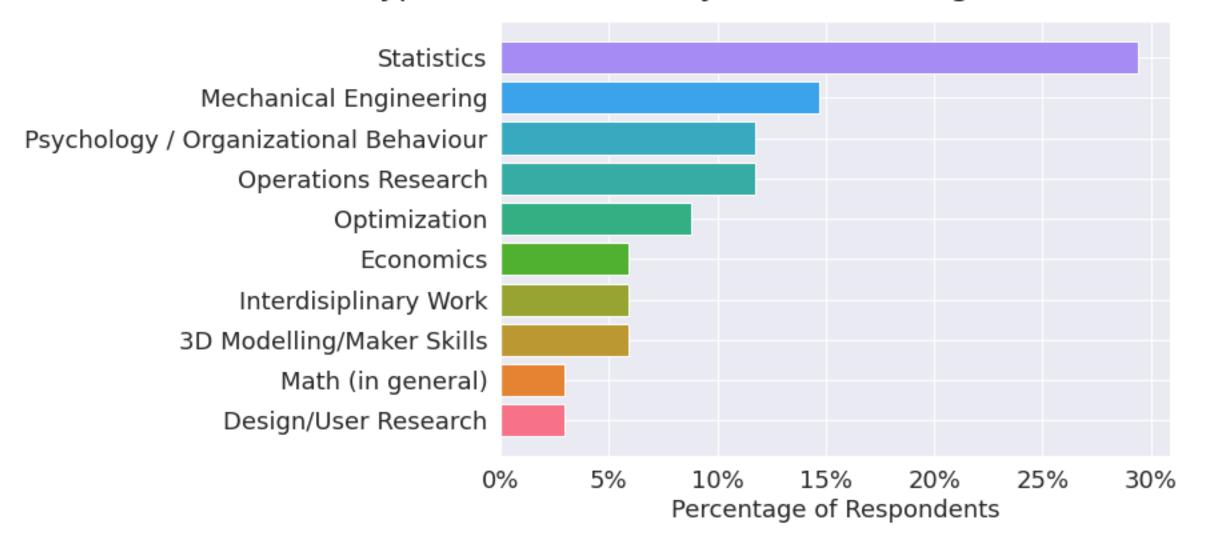
#### What types of courses did you think management would have more of?



Statistics and mechanical engineering courses occurred more than anticipated.

Those that didn't expect more statistics expected less. Seriously, we didn't expected this much stats.

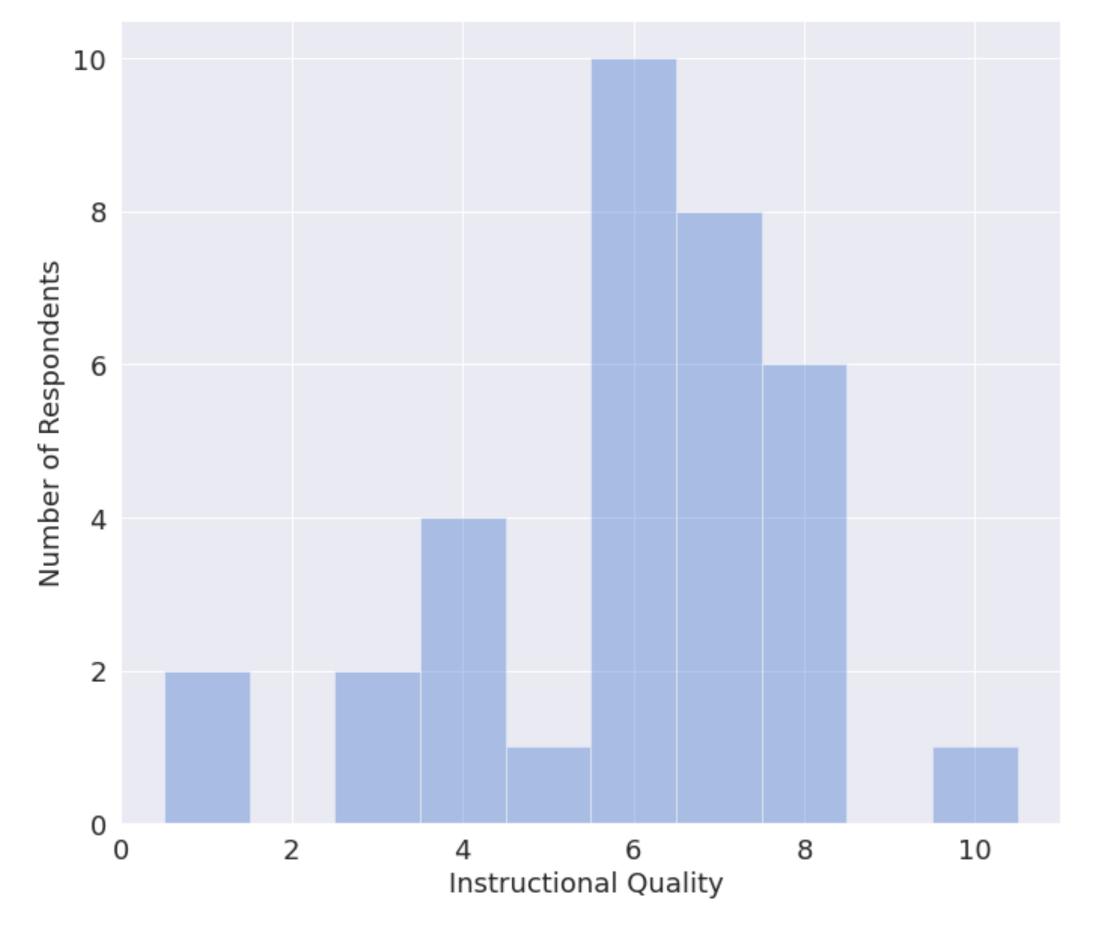
#### What types of courses did you think management would have less of?



satisfaction with instructional quality in the Management Sciences department.

Realistic or not, we had high expectations for the quality of our instructors.

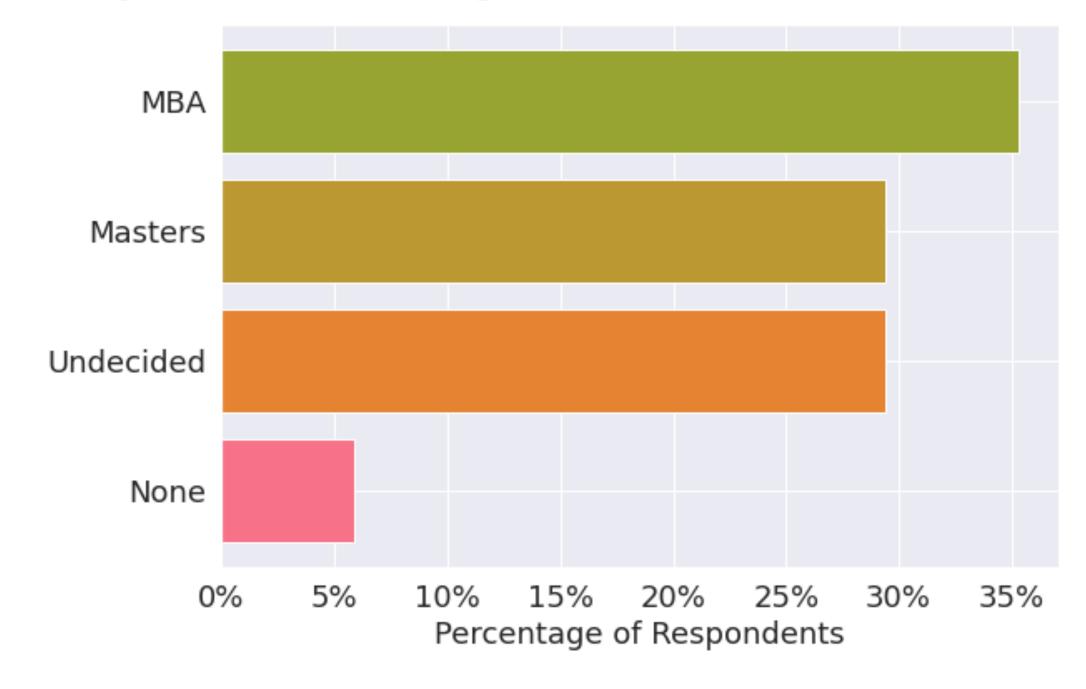
How satisfied were you with professors in the management department?



An MBA was the most popular choice for those considering more school.

Guess we could gain the business experience other programs thought we got in our undergrads.

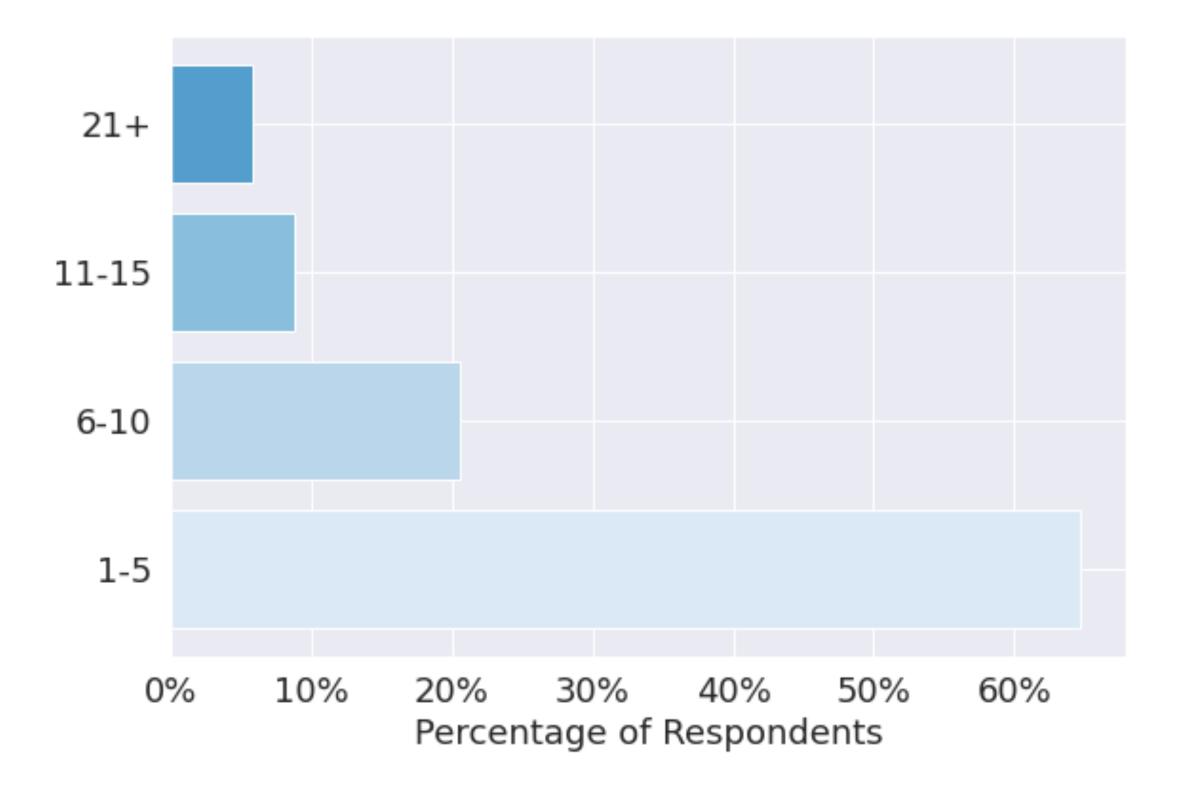
Would you consider doing more school? If so, what would you do?



anticipate staying in touch with 1-5 members of our class

No-one picked 0, but seriously, who are the 2 people that expect to stay in touch with more than 21 others? Clearly not everyone feels the same way.

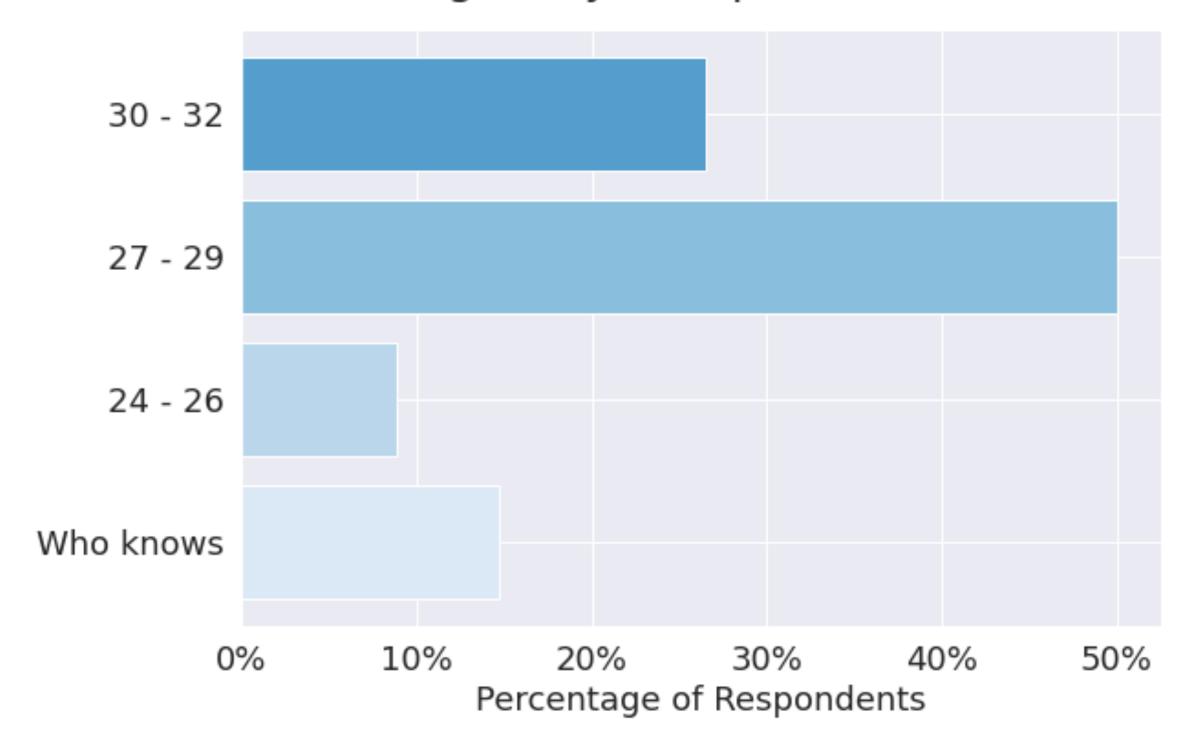
# How many management 2020 classmates do you see yourself staying in touch with 10 years from now?



27-29 is the most popular age to get married.

I'll be waiting for my wedding invitation in... 5ish years!

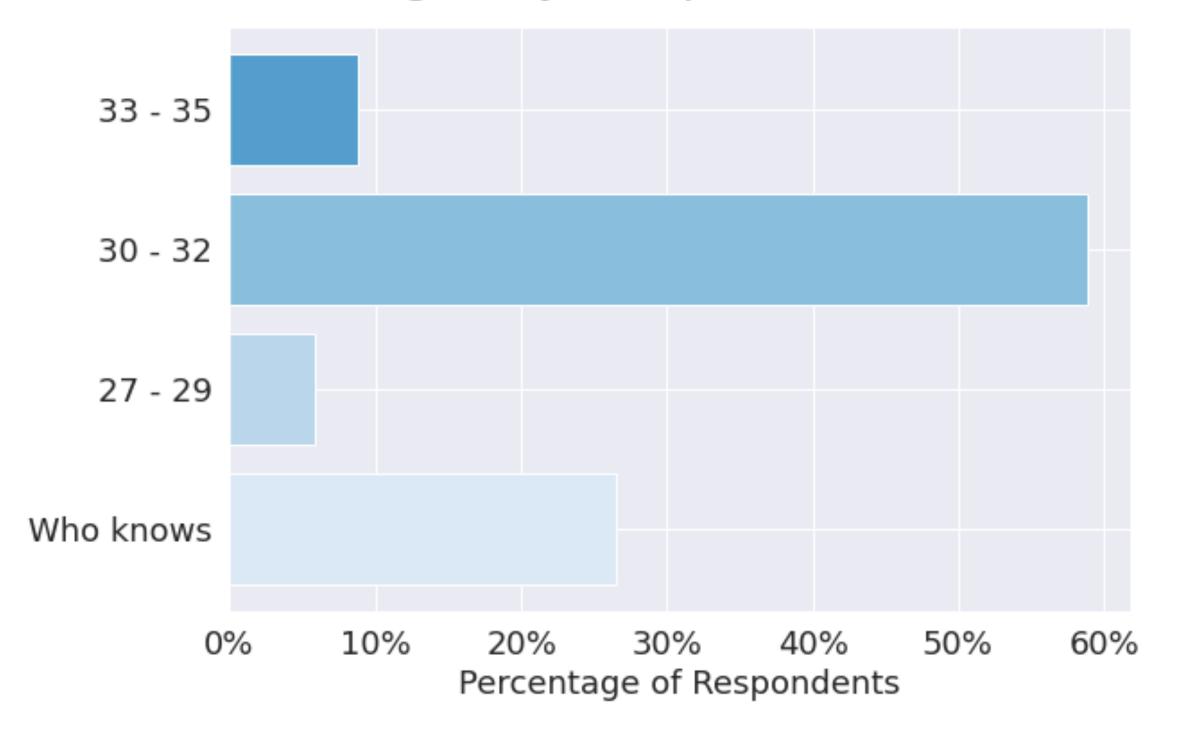
## At what age do you expect to be married?



30-32 is the most expected age to have kids.

Who knows comes in a (sorta) close second.

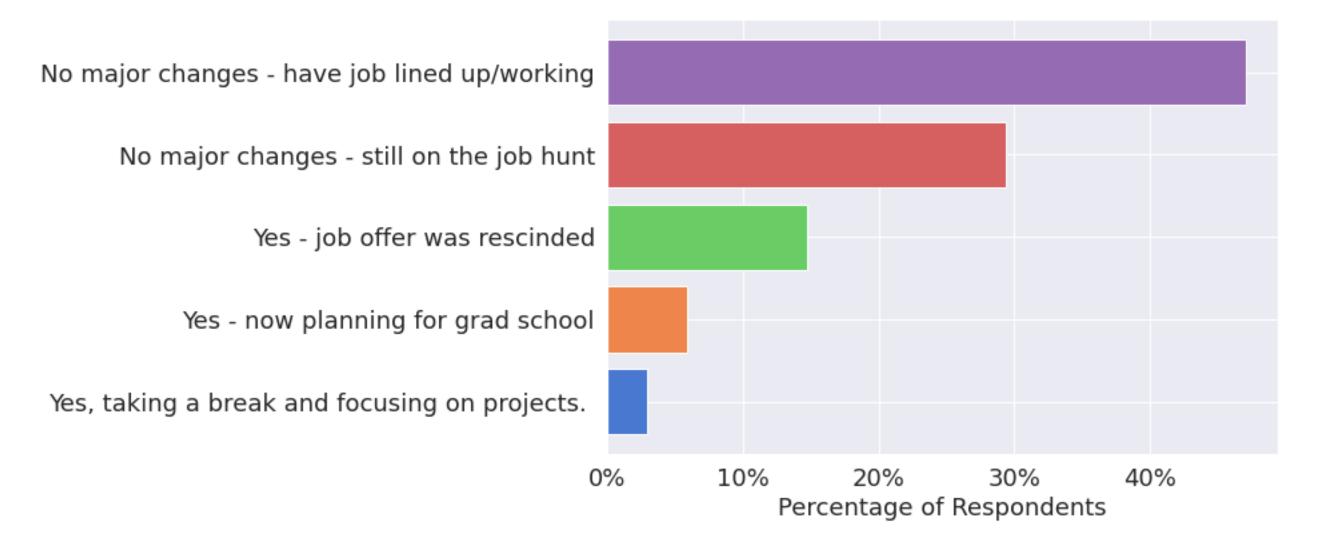
### At what age do you expect to have children?



didn't have work-related plans changed due to COVID-19.

Let's be real, 100% of our lives have changed.

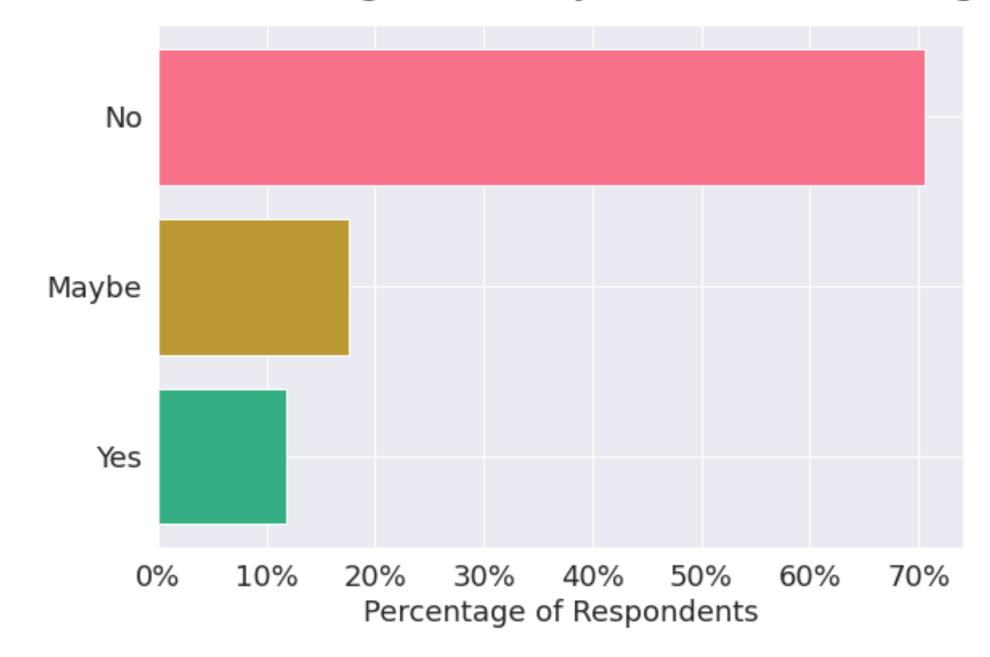
#### Has COVID-19 changed your post graduation plans?



will think differently about where they want to live now.

COVID-19 has changed a lot of things.

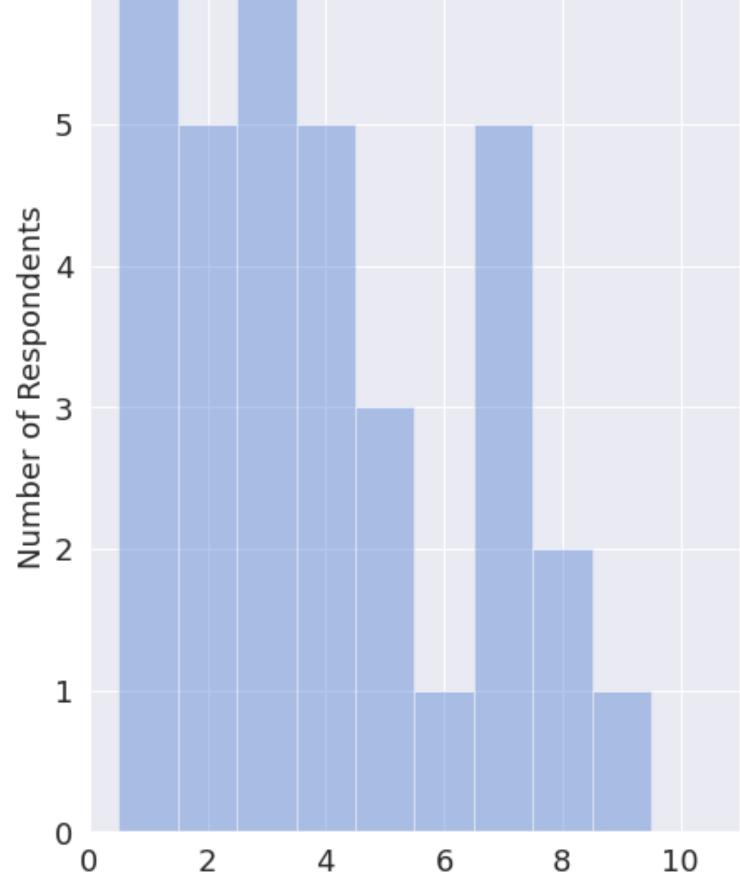
#### Has COVID-19 changed where you want to live longer term?



On average, we felt less academic stress as a result of the COVID-19 pandemic.

4B was definitely different than expected... but not necessarily more stressful academically.

How much added academic stress did you experience due to COVID-19 during the last term?



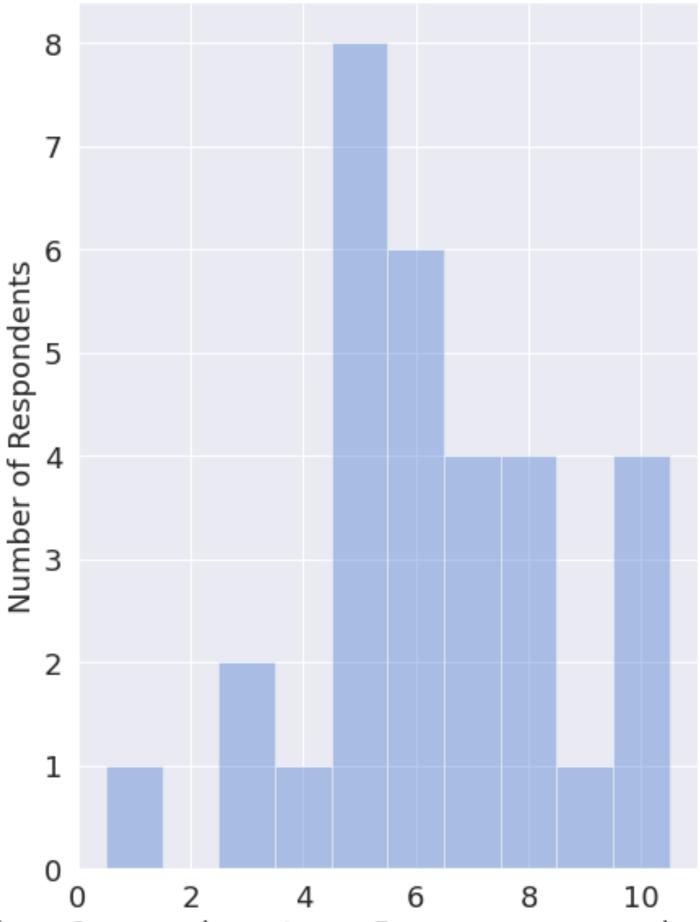
Academic Stress (where 1 = way less stress, 5 = same as normal and <math>10 = way more stress)

On the other hand, job search related stress increased as a result of COVID-19.

Although COVID-19 has definitely changed what the job market looks like, recovery seems to have already started - roughly 40% of the Canadian jobs lost in March and April have been recovered.

Source: <u>TD</u>

How much added job search stress did you experience due to COVID-19 during the last term?



Job Search Stress (where 1 = way less stress, 5 = same as normal and <math>10 = way more stress)

# What advice would you give to yourself in first year?

# Managing Stress

Don't stress out. Academics isn't everything. SF isn't everything. Everyone is coming into this with an inflated sense of self, including yourself. Adjust your expectations and conduct yourself accordingly.

Relax, you got this

If you need help then you have to ask for it.

It's okay to take time for yourself - your health (mental & physical) is important!

Proactive Learning

Learn how to self-learn quicker

Take your education into your own hands. Be proactive

Be proactive with your job search. Enjoy your undergrad experience and try new things!

Make time to meet people, do things that bring you happiness, and do whatever you can to manage your stress.

Don't fall behind on lectures.

Go to class.

Take it easy, don't stress so much

Always keep learning!

Don't be scared to switch program

# Enjoy, relax, be proactive and remember to make time for what's important to you.

# Enjoyment & Encouragement

Balance is key

Explore your options and be adventurous, you won't get this chance again

Don't compromise on sleep and diet - this includes not living on residence.

Invest more into your hobbies and exploring new hobbies

You are just as smart as everyone else. :)

Spend more time seeking community and friends. School is stressful but get out and enjoy yourself!

Everything will be okay. Should go out more

Everything will be okay! You will get through this!

Work hard, but at the end of the day (unless you're doing post-grad studies) your average won't matter to anyone so don't get so focused on grades that you forget to enjoy your time in university.

Enjoy it and make lots of friends.

Enjoy your time at university, work hard and don't stress.

Enjoy the time, it goes by so fast

Be involved, make connections and don't stress about the grades you get, especially in first year

Keep calm, all struggles take time but in the end, if you work hard and smartly, everything works out.

Invest in bitcoin then sell when it hits 17k. Also you're ace

# When thinking about your overall Management Engineering experience, is there anything you wish was different?

# Jobs

The program helped us explore career paths earlier. The class was really helpful to each other once we started specializing and had a clue what we wanted to do.

There was more clarity in future jobs

That the courses/profs in MGTE were better. We can certainly hold our own when it comes to co-op competition, but academically I feel like we don't get as much out of our 5 years as other engineering programs.

# Personal Experience

I had gone to class.

I was more ambitious during the first couple years of my undergrad.

3B was easier

I'd have been more disciplined in first year

# I wish...

# Profs / the department

They gave us a better way to explain our program instead of everyone coming up with their own version of what we do

There was less operations research, statistics and optimization courses. These parts of the program were significantly under emphasized on Management Engineering marketing and information materials.

We had some better profs

I hadn't stressed about passing as much and that our professors understood that we had more going on than just their course.

Not really, I think I just chose the wrong program

I got more involved

Some courses were thrusted on us which were not necessary. We need more options to select our own courses.

We had better profs with better teaching methods. Chance to apply more of what I learned in school on the job.

I understood why management engineering is looked down on. The faculty really didn't advertise the program properly. That really sucked. On top of that, it really just felt like i was just a number, no one cared about what really is going on in my life and the professors assumed that your academics were your entire life.

We had more electives

# Did you learn/experience anything you didn't expect to, or have a change in perspective that your Waterloo experience helped shift?

# School

Operations research as an entire field.

Waterloo terms are hard, stressful, and depressing at times. But if done right it sets you up for really enjoyable co-ops and gives you a head start post grad.

Didn't expect so much pressure and so many things to manage at once. Helped me learn how to manage real life working situations better.

I was able to explore so many different types of companies. I learnt how to deal with different people, and about industries I didn't know existed. I knew school would be hard but I didn't expect it would be as hard as it was.

# People

Values, better teamwork, ideologies and overall understanding of different peoples beliefs

Learned about different people and developed a better understanding of people

Meeting many different people from different backgrounds. More comfortable to engage with them

# Some loved Waterloo, some didn't. But everyone learnt a lot about themselves and valued coop experiences. The big picture Co-op

Investing in activities that increase energy (exercise, time with pets) while decreasing academic time actually kept my average the same.

Stress less, in 5 years, it will be nothing

Career is not everything

I've learned that it's important to be focused enough to have goals but flexible enough to adapt if you don't meet your goals.

I learnt how to put up with shit. People's shit, prof's shit, co-op's shit. I hated being in waterloo. I was away from my friends and family and partner. Sure, i got a decent education, but waterloo literally destroyed me mentally and physically.

Co-op is so valuable - I don't think I realized how much of an advantage we have because of co-op at the beginning

Co-op was the best part of the program. It helped guide and direct my career path and determine what I do and do not like in a job.

Applicable industry experience, living independently

Co-op terms and experience helped discover what I wanted to get out of my career, what type of work I did and didn't like.

I really did not expect to be learning about software development and I did not expect to like it as much as I did. Now I have a full-time software engineering job lined up in Silicon Valley which I never would have expected and I also would not have been open to moving to another country if it weren't for my co-op experiences.

#### FINAL REMARKS

# APPRECIATION & DISCLAIMERS

The creation of this profile wouldn't have happened without inspiration from previous Systems Design, Software and Biomedical Engineering class profiles. Huge shoutout to SYDE 2019 for publishing their class profile on GitHub.

This survey and its results don't represent our entire class nor the program as a whole. The survey was conducted completely independently of the Management Engineering department, Faculty of Engineering and/or the University of Waterloo.

# Thank you!

Management 2020

**SYDE 2017** 

**SYDE 2019** 

**SYDE 2018** 

BME 2019

**SOFTWARE 2018** 

SOFTWARE 2020

#### FINAL REMARKS

# BYE MANAGEMENT, BYE WATERLOO

Management Engineering was an adventure that helped shape who we are and our careers. The most common learning was to enjoy the time, use coop to your advantage and use your class as a support system!

Thank you for taking the time to read and learn about our class! We hope you enjoyed learning about our class as much as we enjoyed making the profile!

If you're interested in learning more, about the profile or Management Engineering, feel free to reach out to us!

## Meghan Stronach and Aaron Yim

