

ENV421: Community Research
for Social and Environmental
Change

Meal Care

Final Presentation

Presentation by Acacia, Alice,
Assouma, Danny, Jenny, Zhaopeng



Study Overview and Key Considerations

Who is MealCare?

Scope of Research

Methods

1

2

3

The Survey



CALLING ALL UOFT STUDENTS:

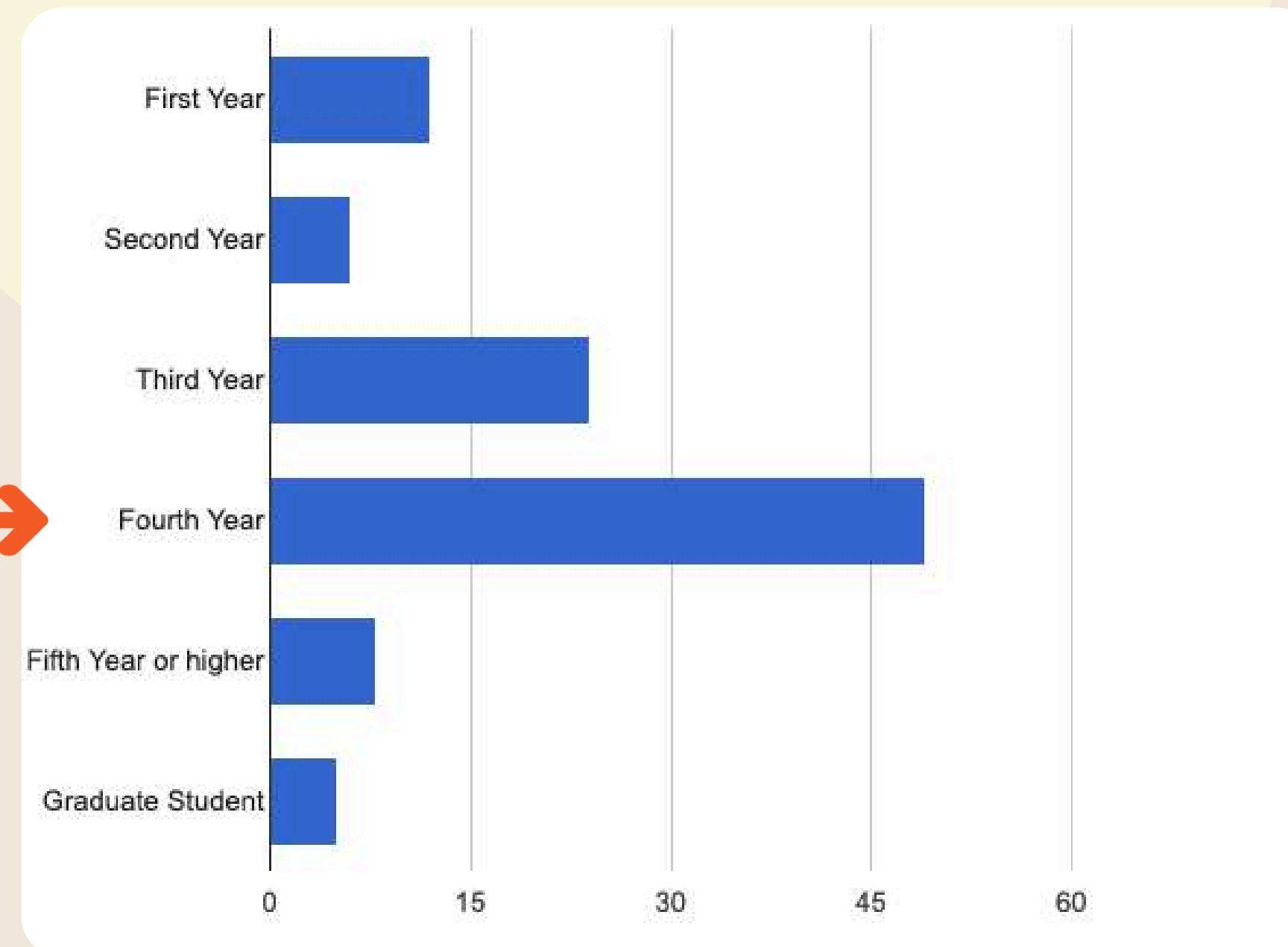


FILL OUT A QUICK
SURVEY ON
COMMUNITY FRIDGES
FOR A CHANCE TO
WIN 1 OF 4 \$25 GIFT
CARDS

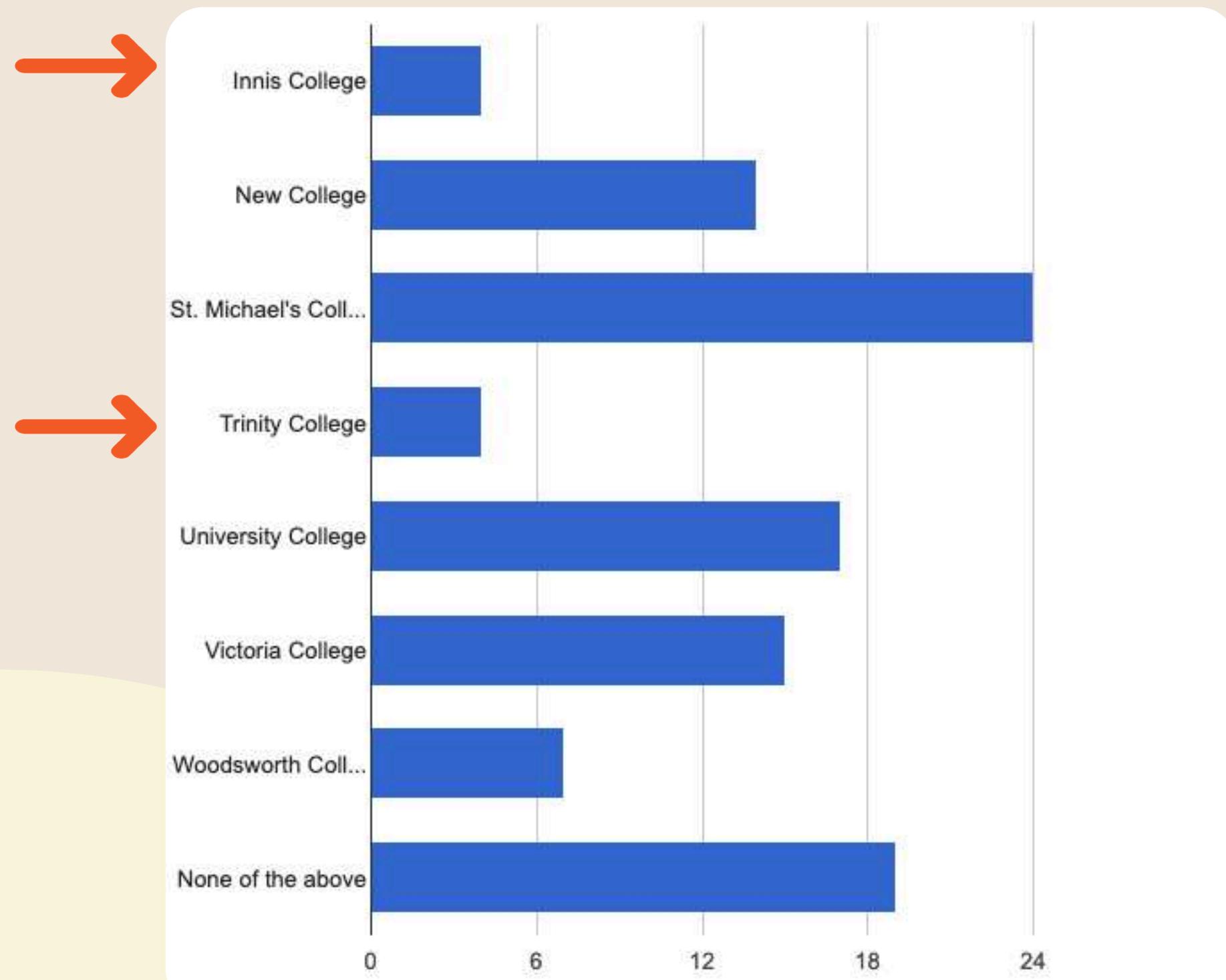
MUST BE A UOFT STUDENT TO PARTICIPATE

Background Information

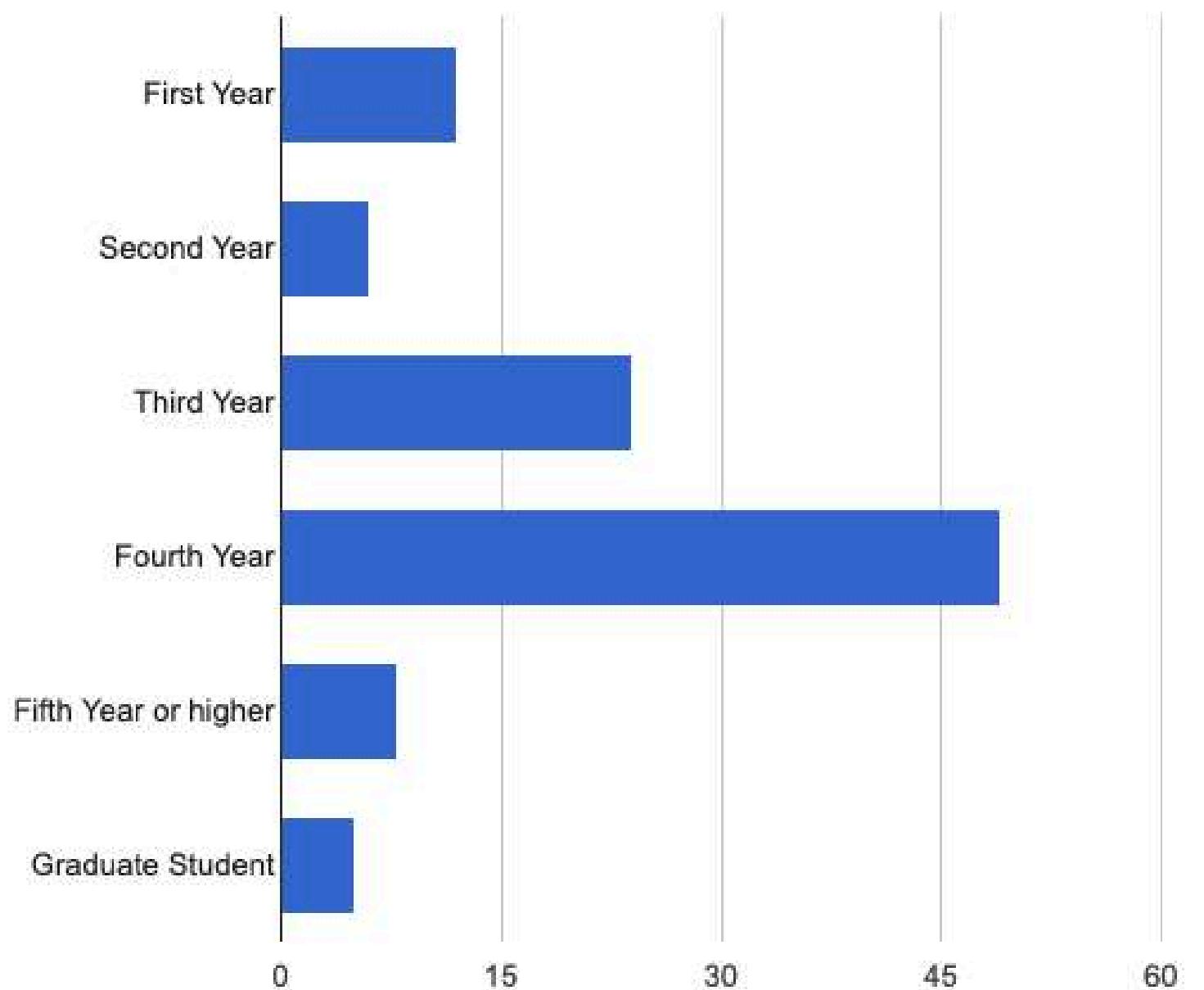
What year are you in your studies?



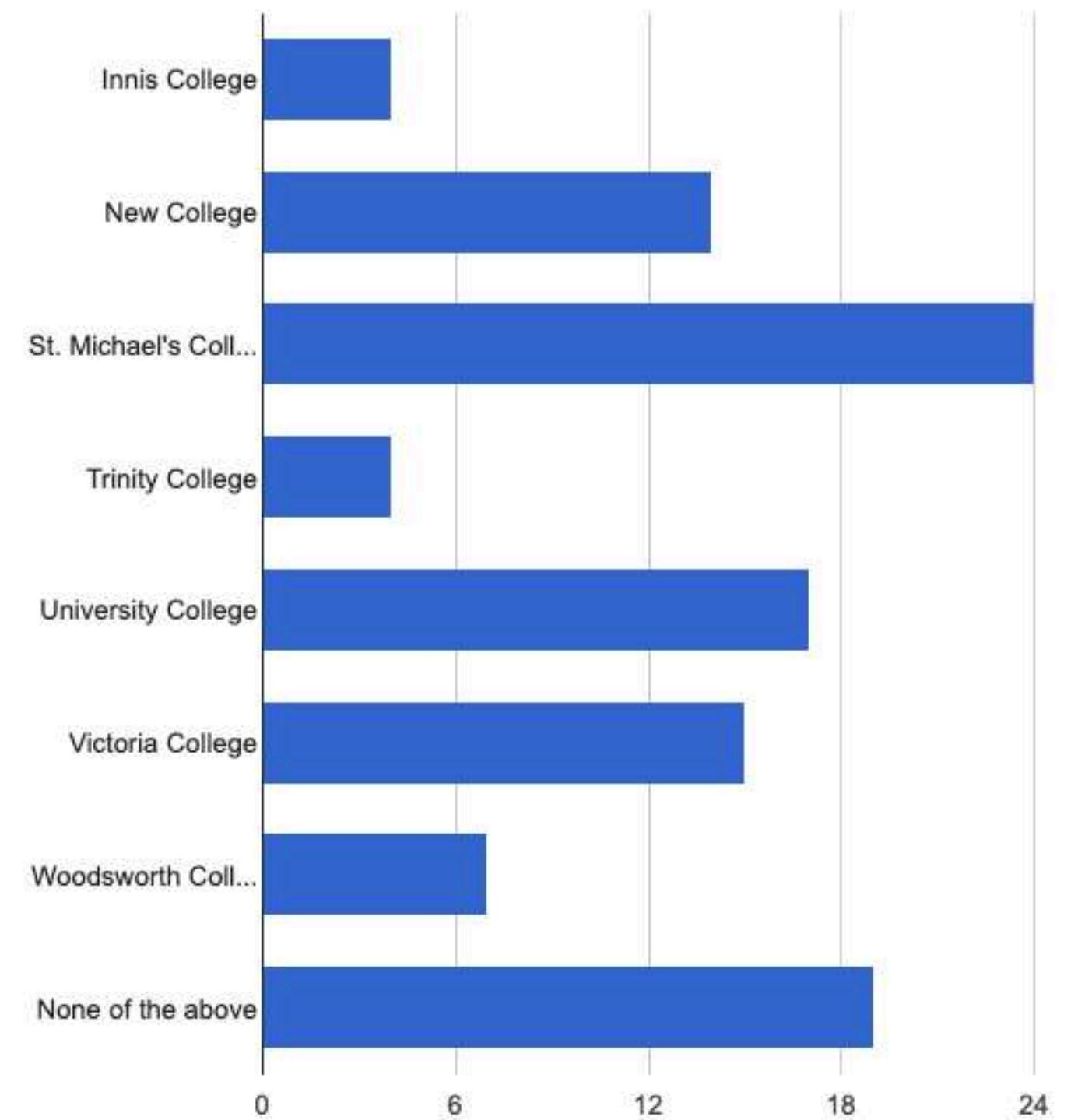
What college are you in at UofT?



What year are you in your studies?

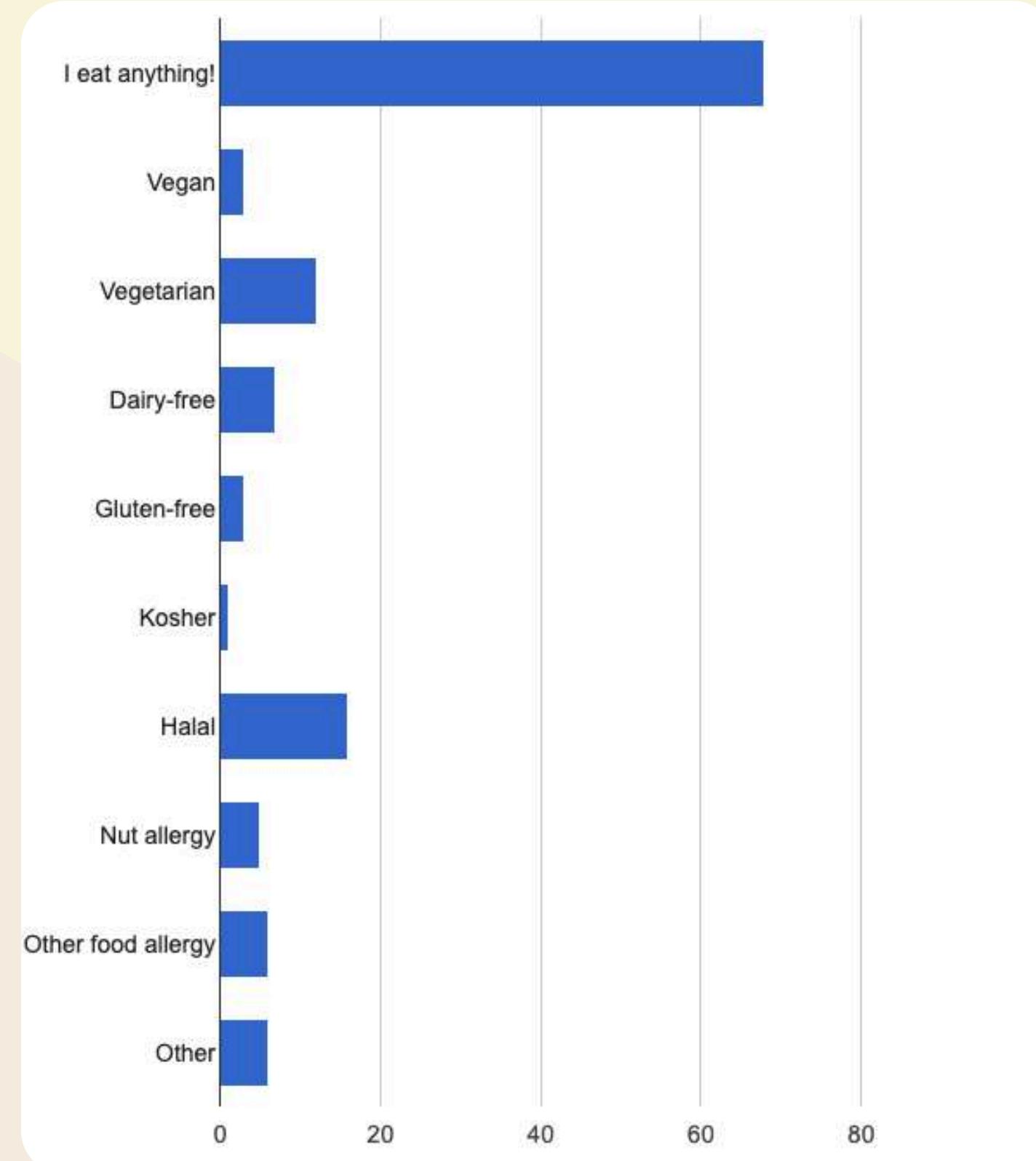


What college are you in at UofT?

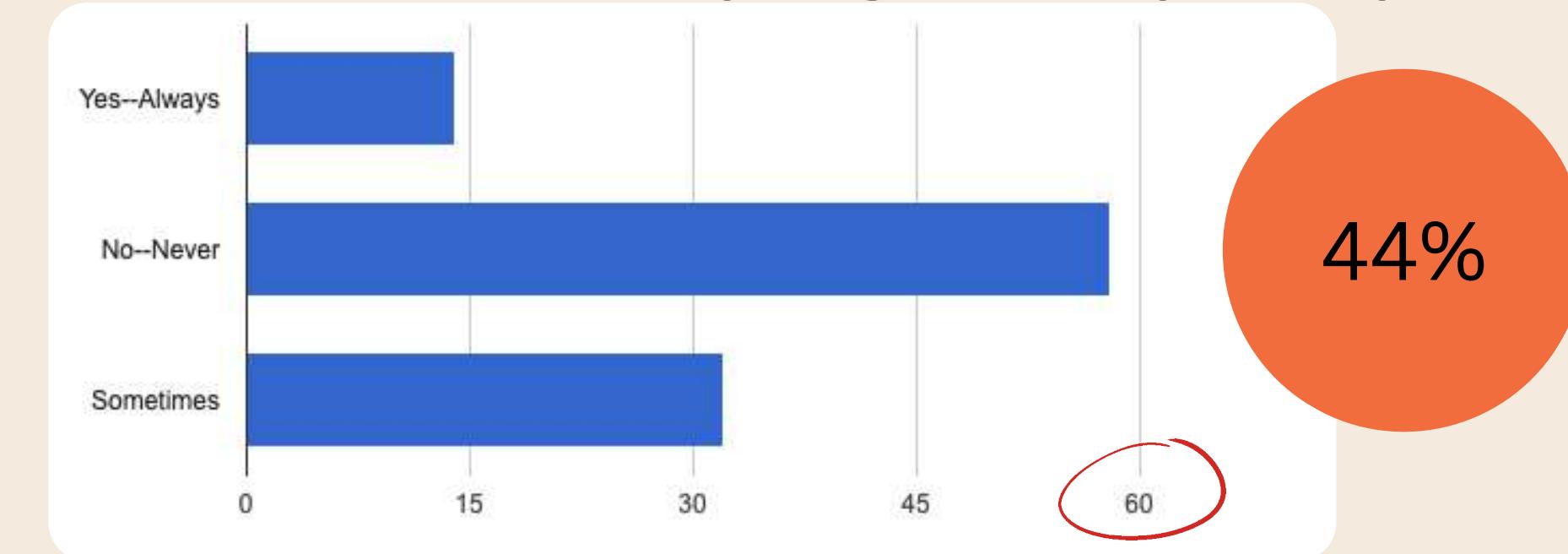


Food Insecurity Screening and Diet

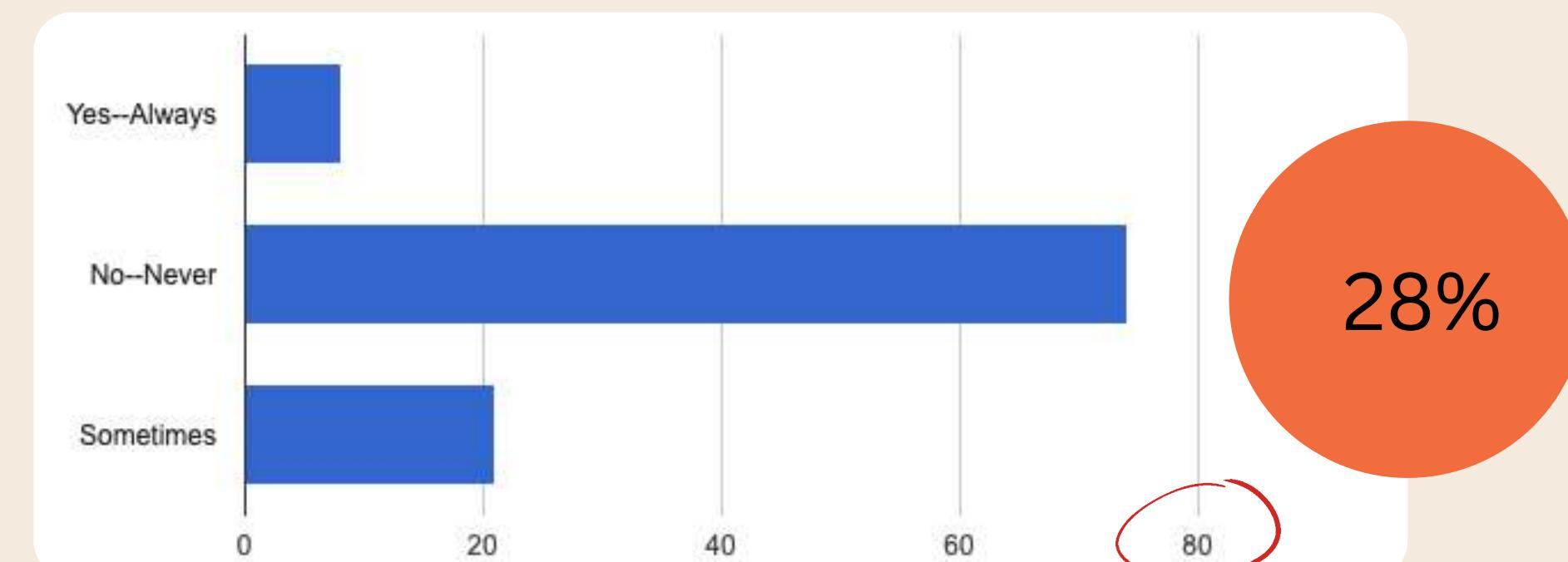
What does your diet look like?



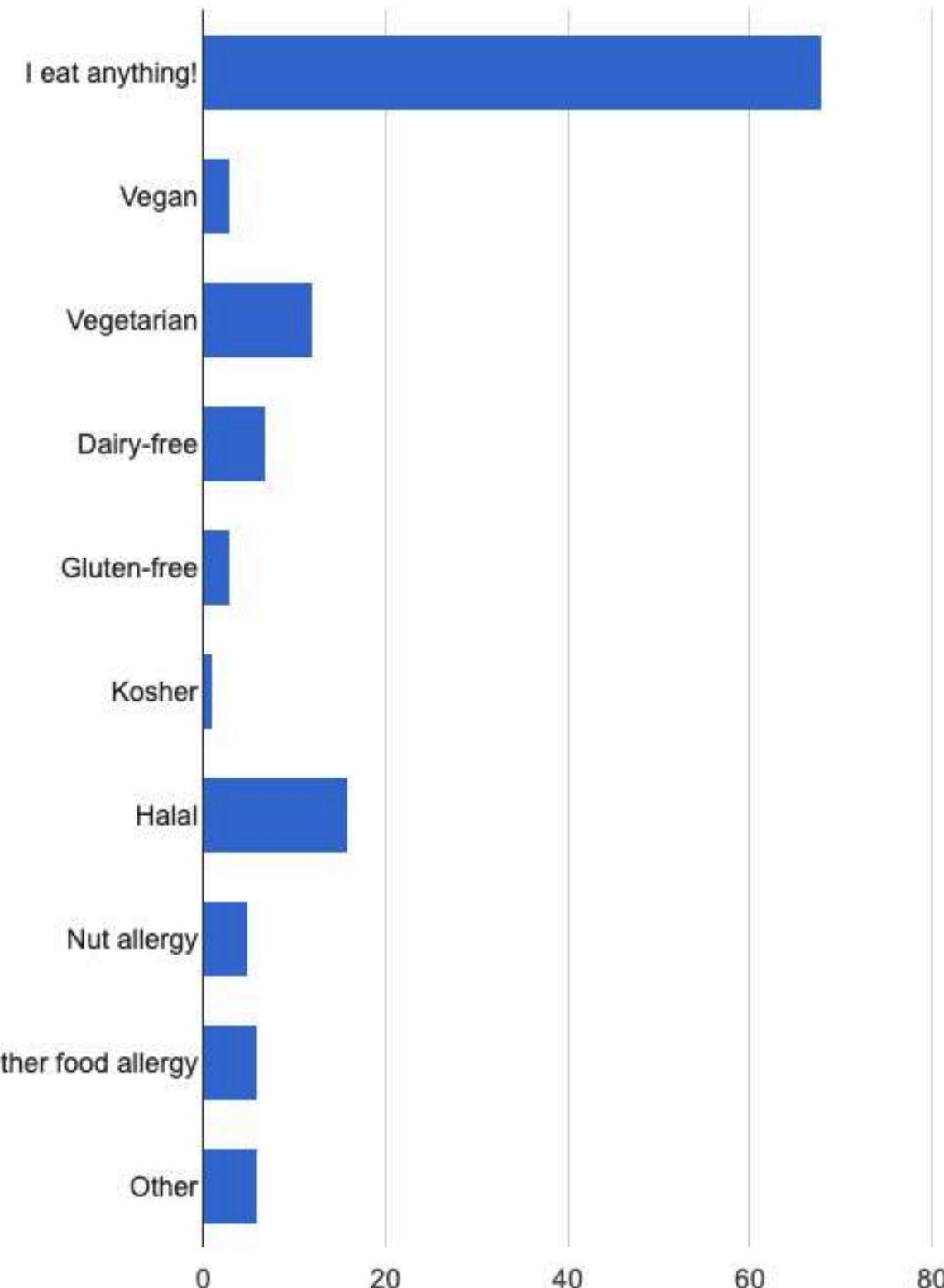
Within the past 12 months, have you worried that your food would run out before you got money to buy more?



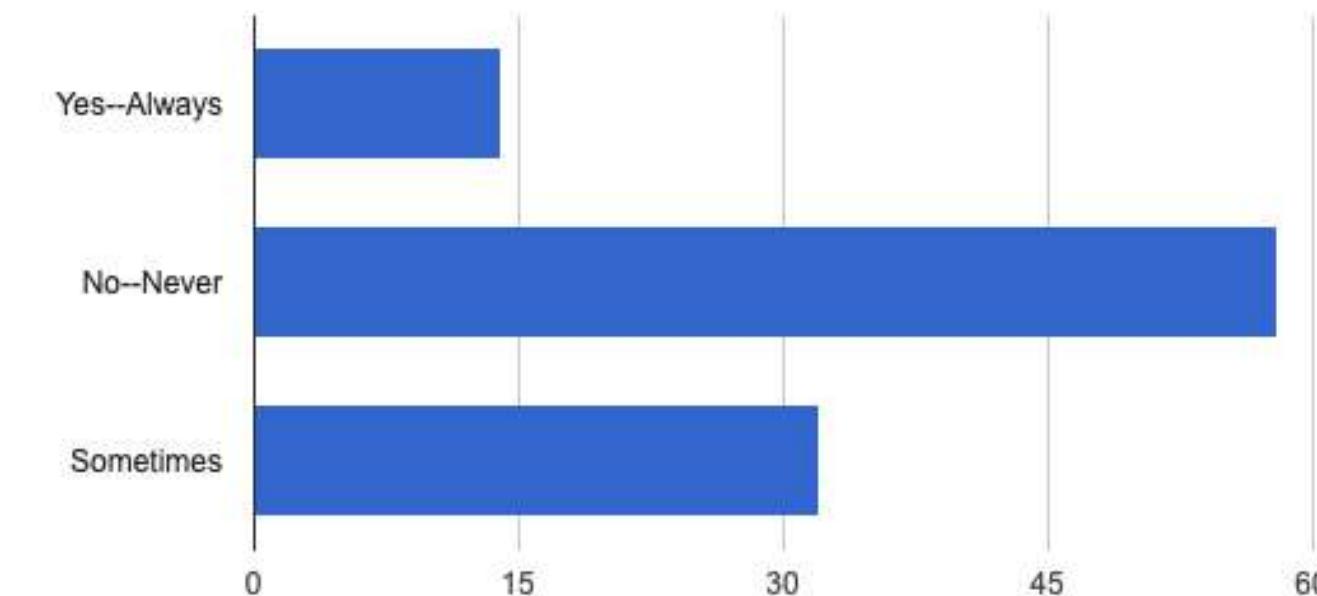
Within the past 12 months, did the food you buy not last and did you not have money to get more?



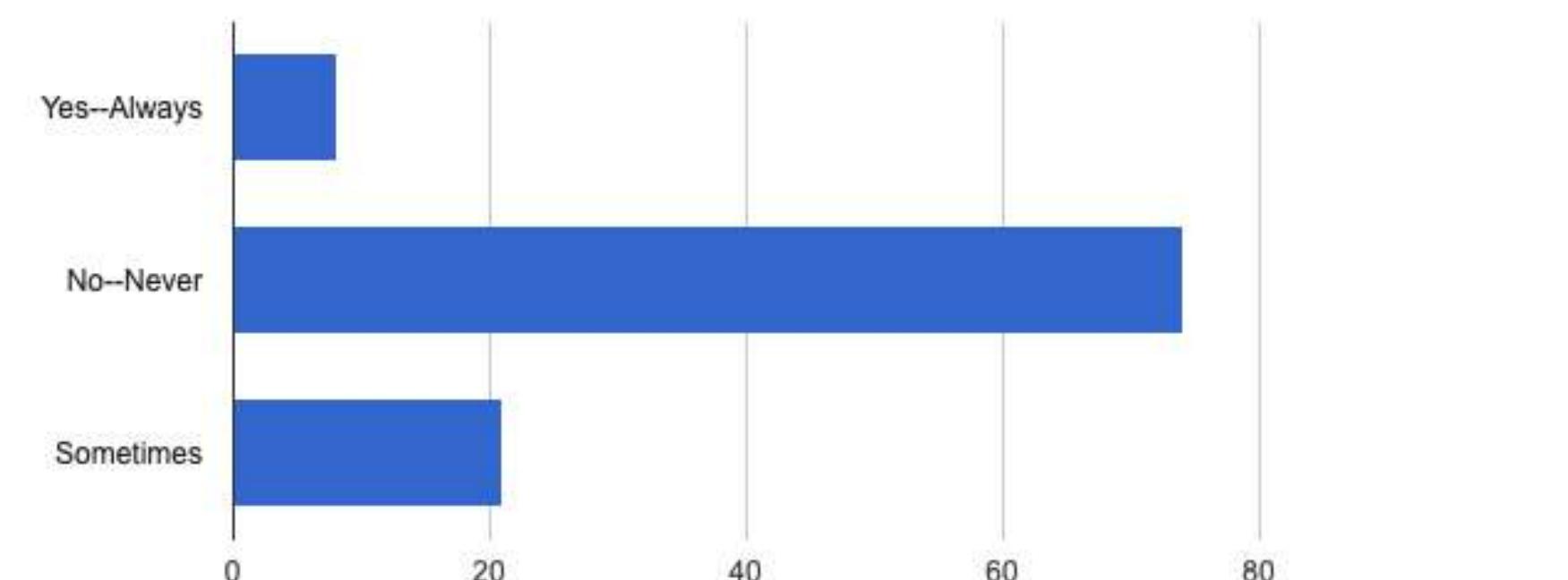
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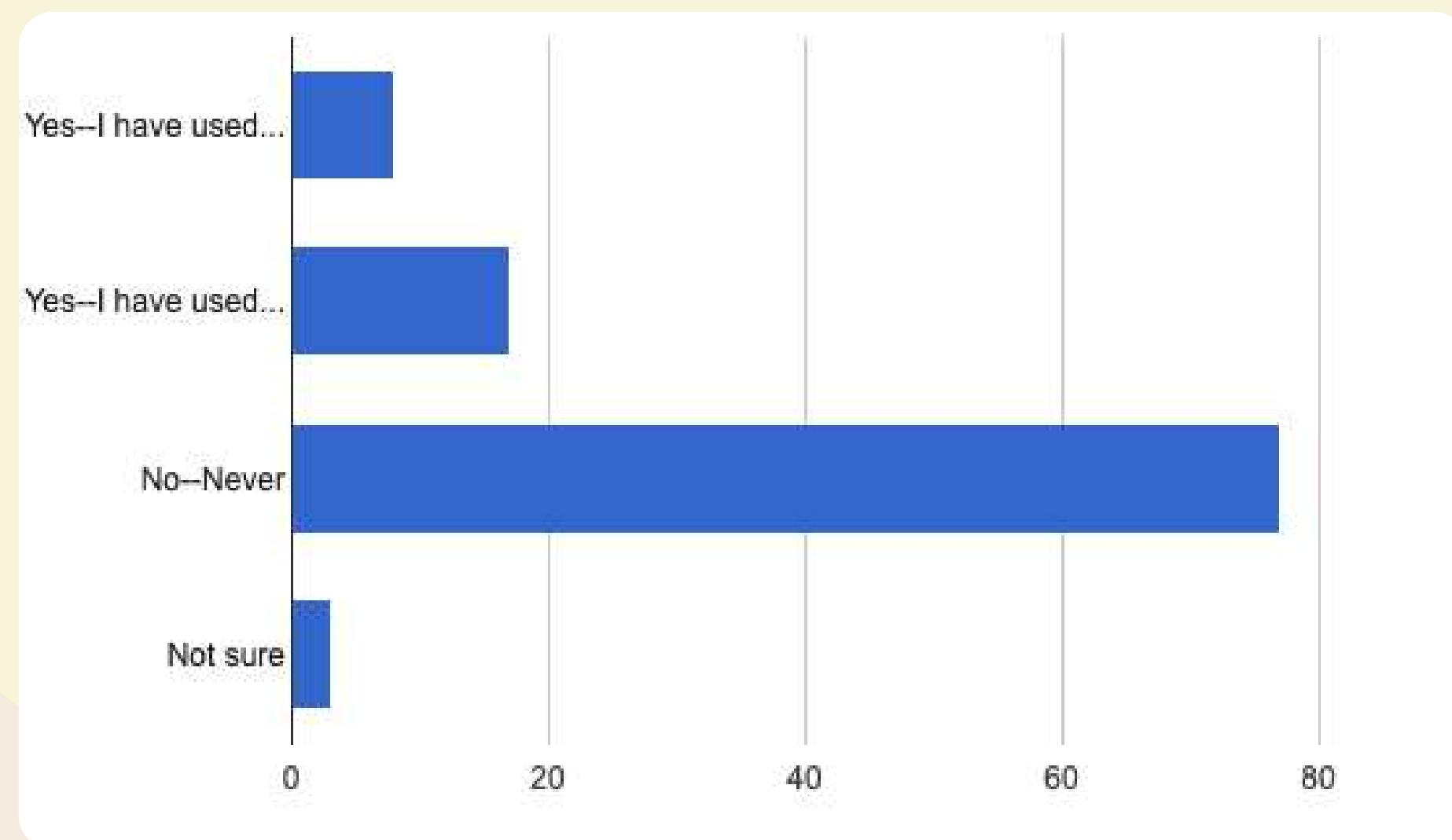


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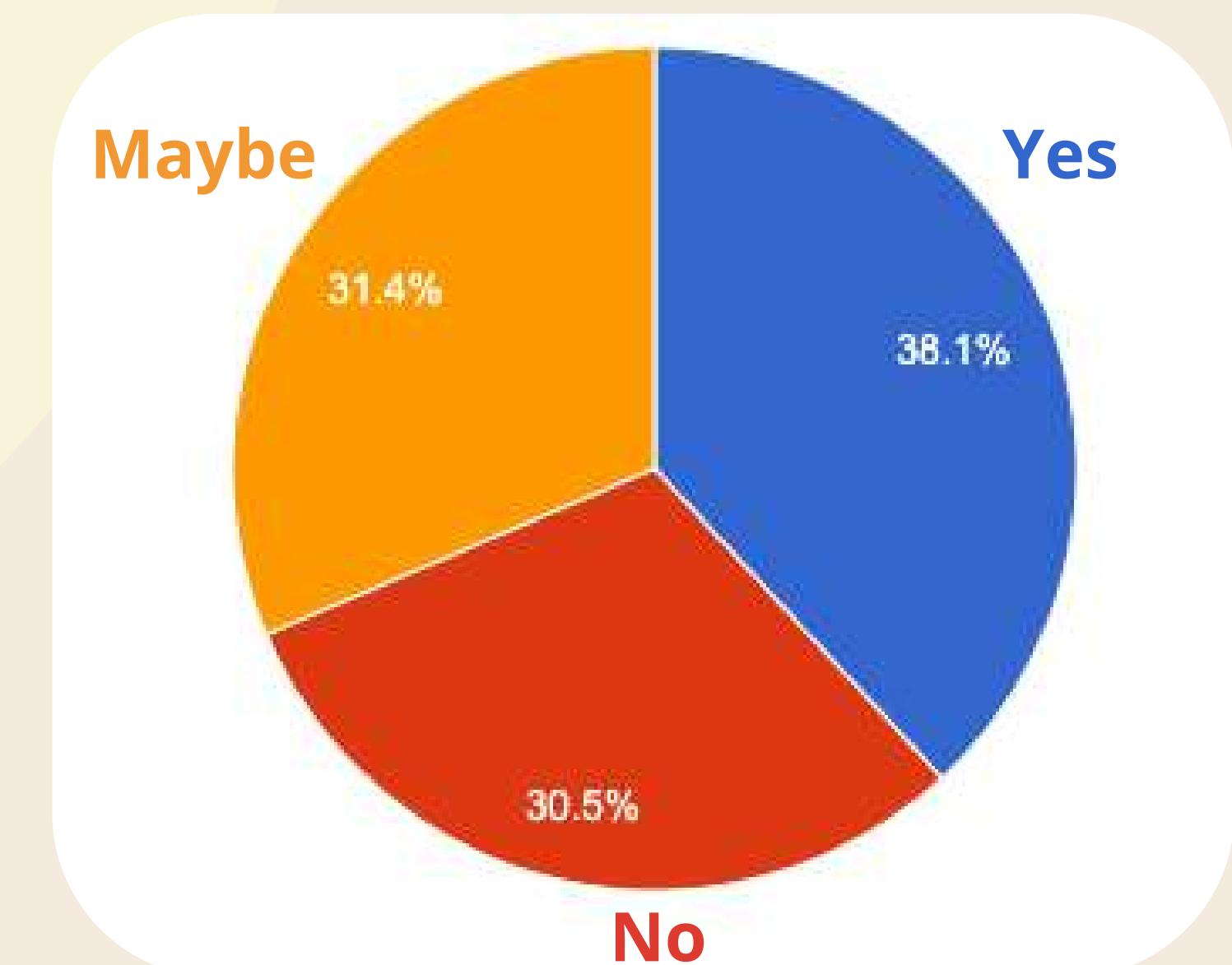


Current and Potential Usage

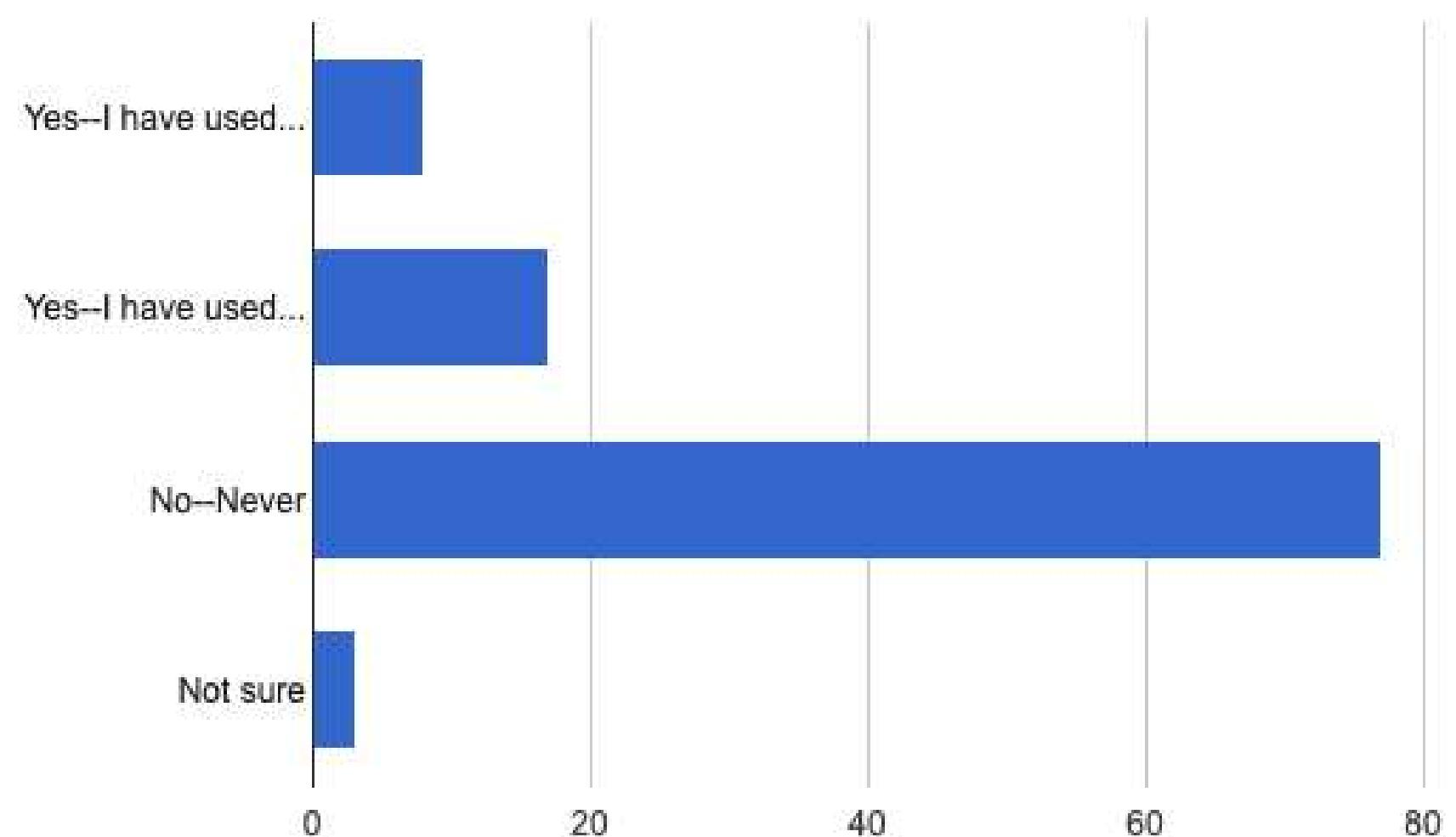
Have you ever used a community
fridge?



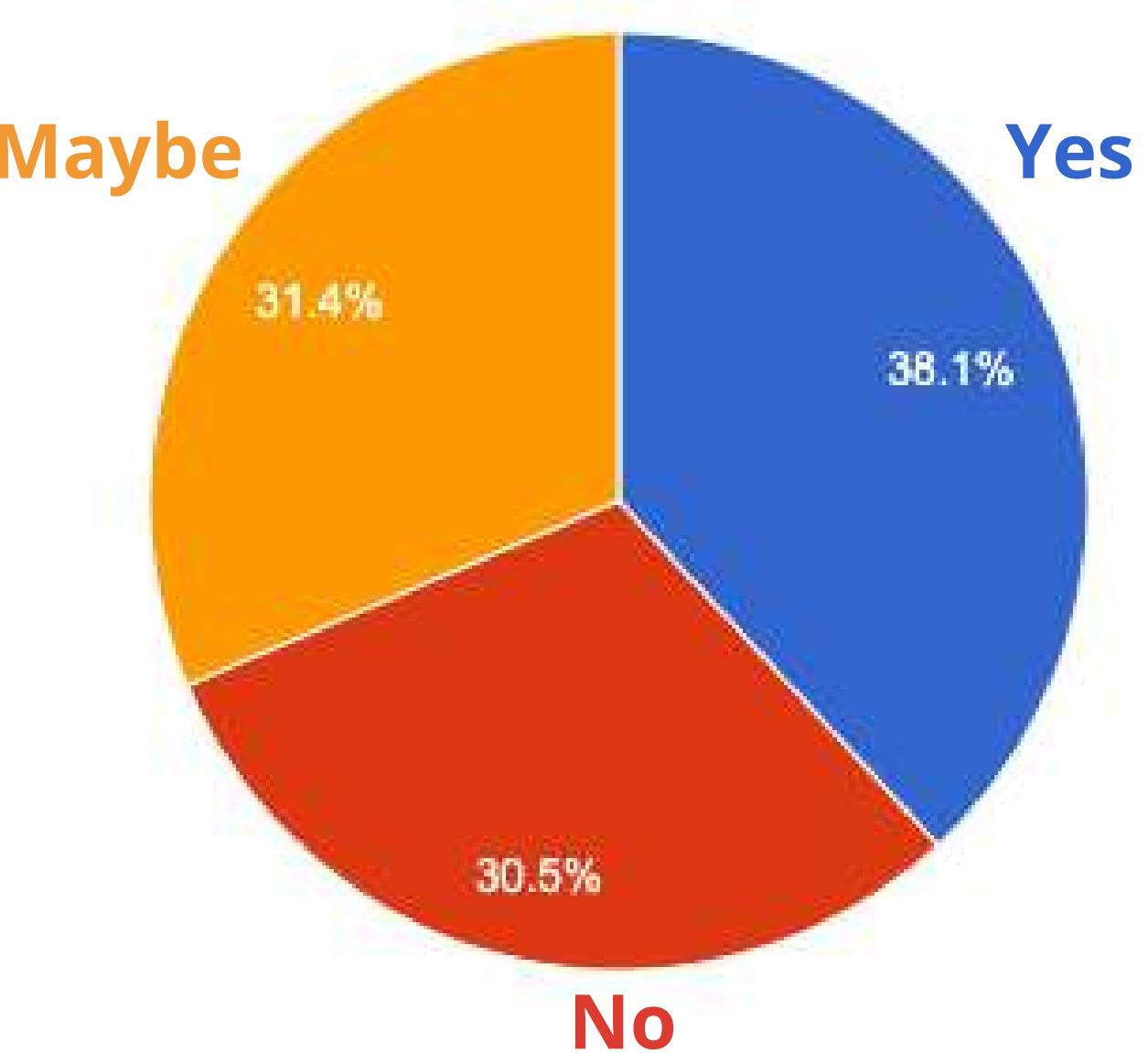
Would you use a community
fridge if it was located in a
convenient location for you?



Have you ever used a community fridge?



Would you use a community fridge if it was located in a convenient location for you?



On the Map

Sidney Smith	29
Robarts	26
Medical Science Building	14
Victoria College	13
Hart House	13
University College	12
UTSU	11
Bahen	10
Gerstein	10
St Michael's	10

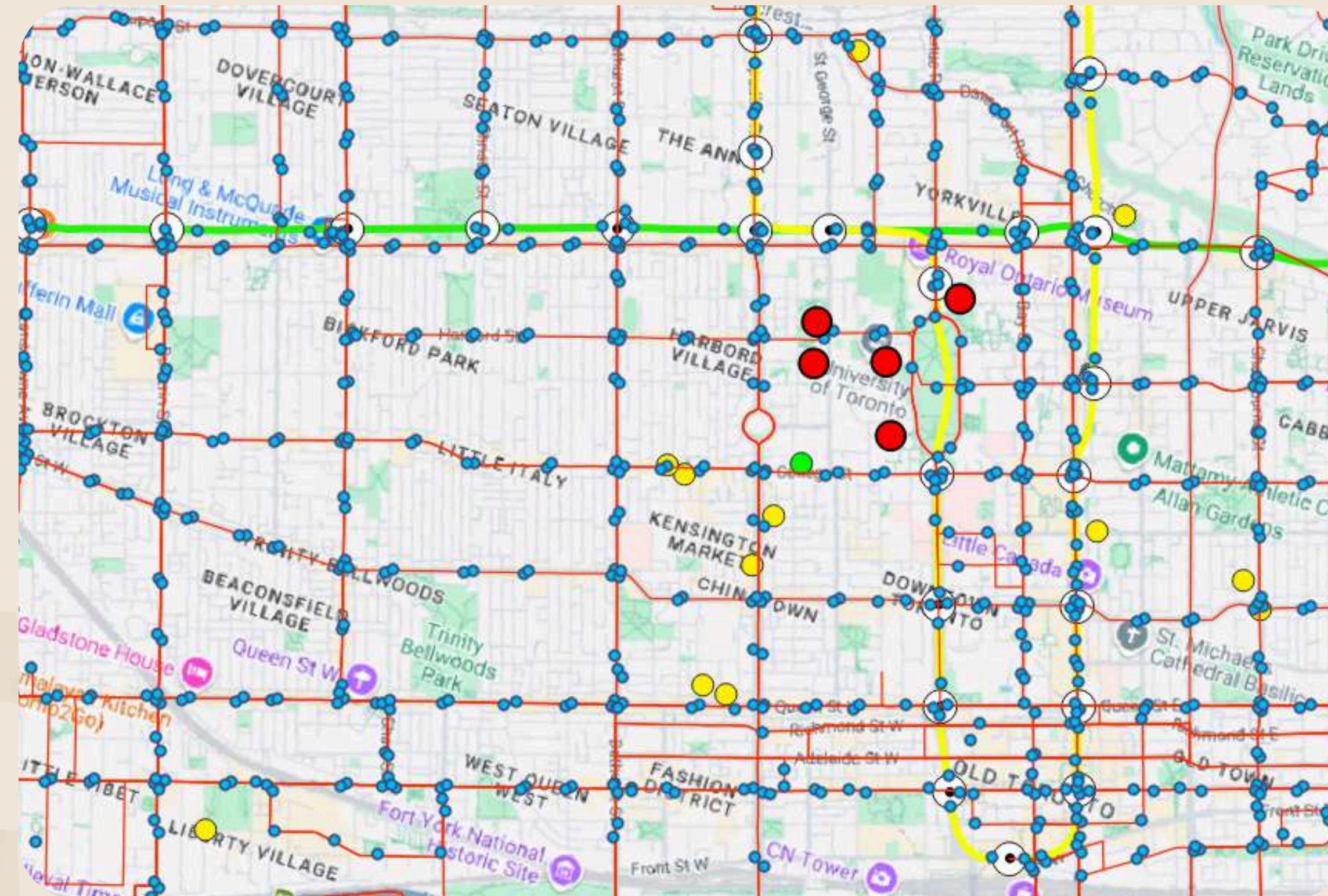


Which building(s) do
you think are
optimal locations
for campus
community fridges?

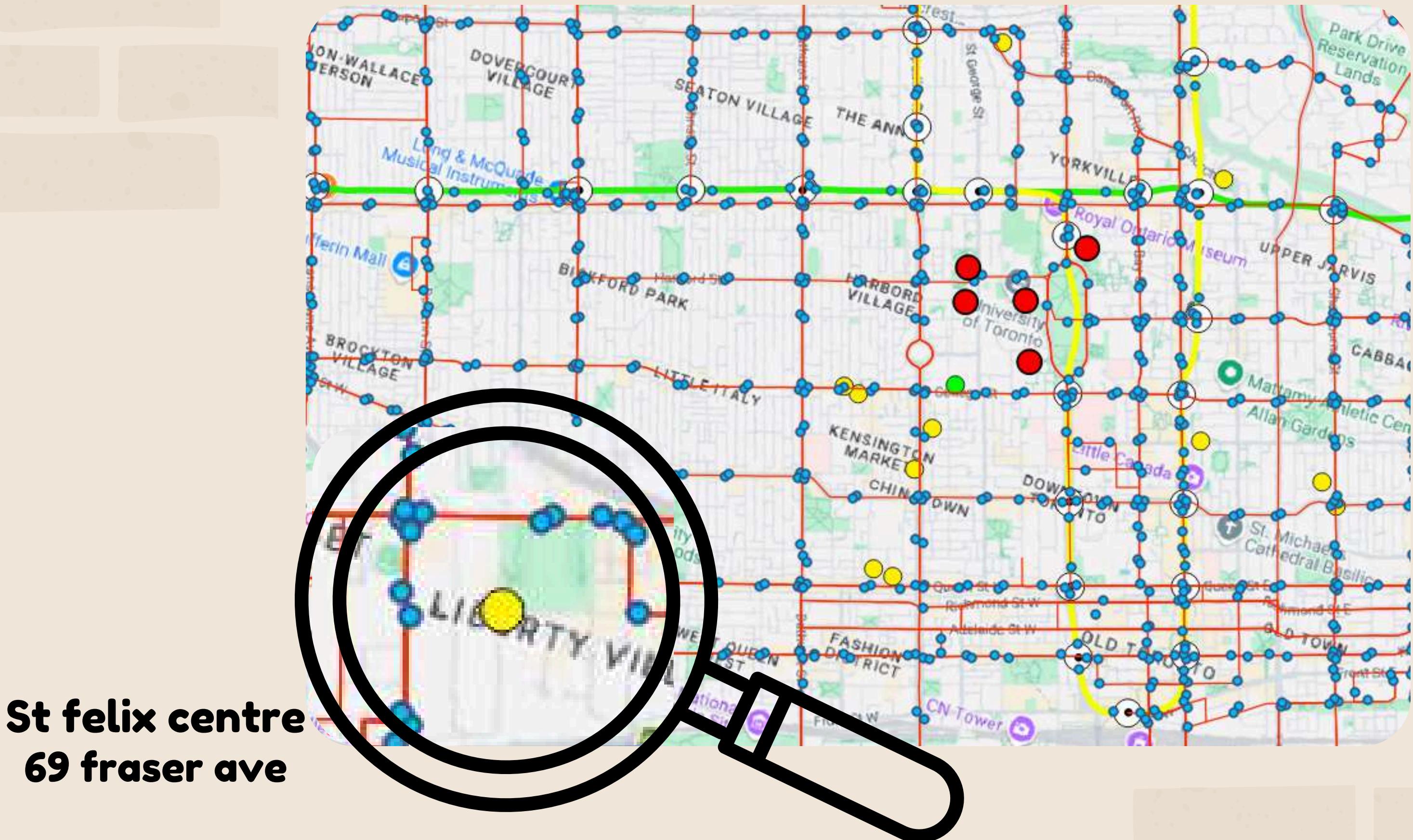
Niche Choices

Innis College	8
Varsity Arena	4
Athletic Centre	3
McLennan	3
Commuter Centers	2
OISE	2
Earth Science Building	2
Myhal	2
Student Center	2
Kelly	2
Victoria Student Pub	2
Convocation Hall	1
Woodsworth	1
Rotman	2
Daniels	1
Exam Center	1
Queen's Park	1

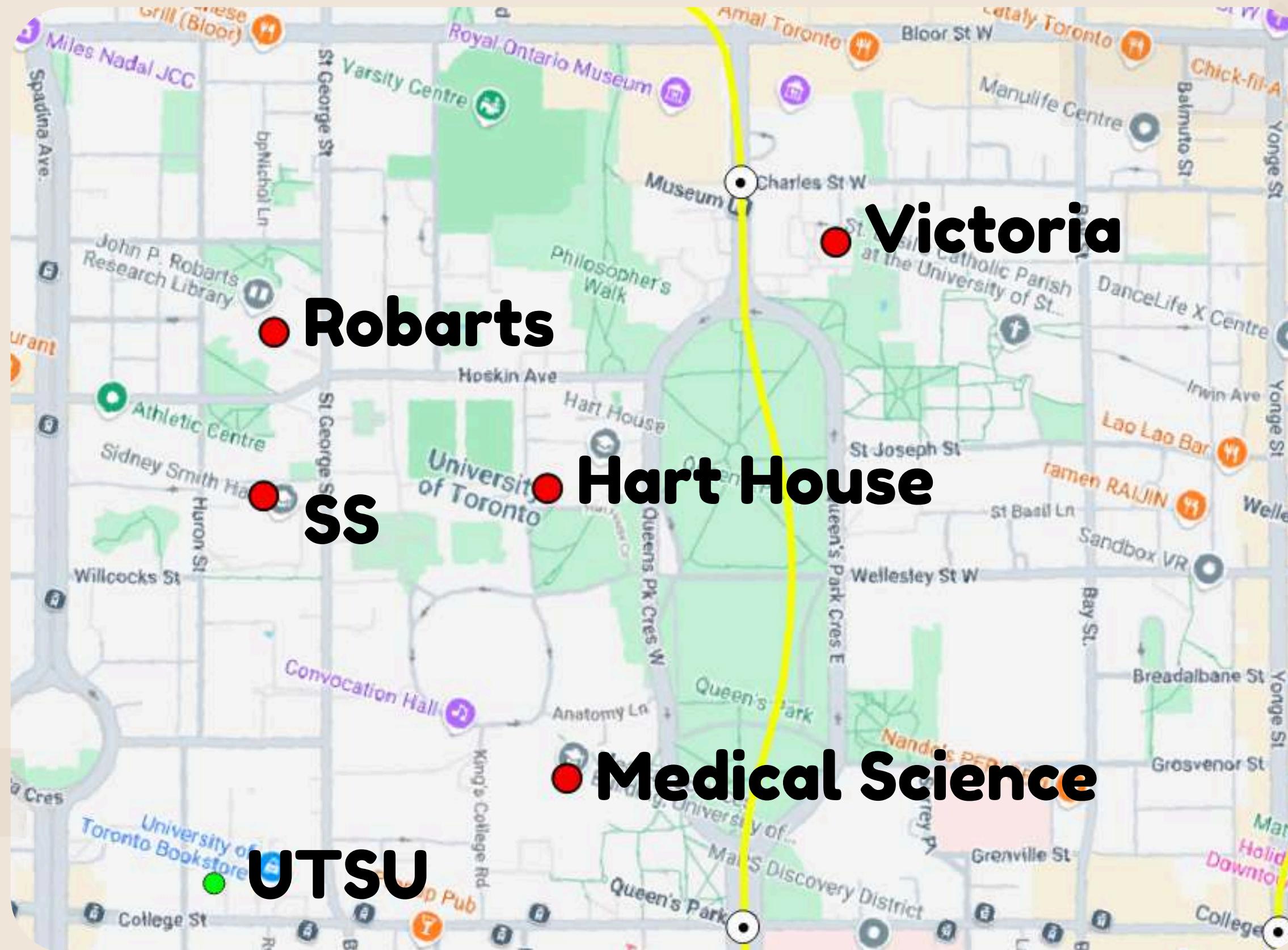
Locations Map



Locations Map

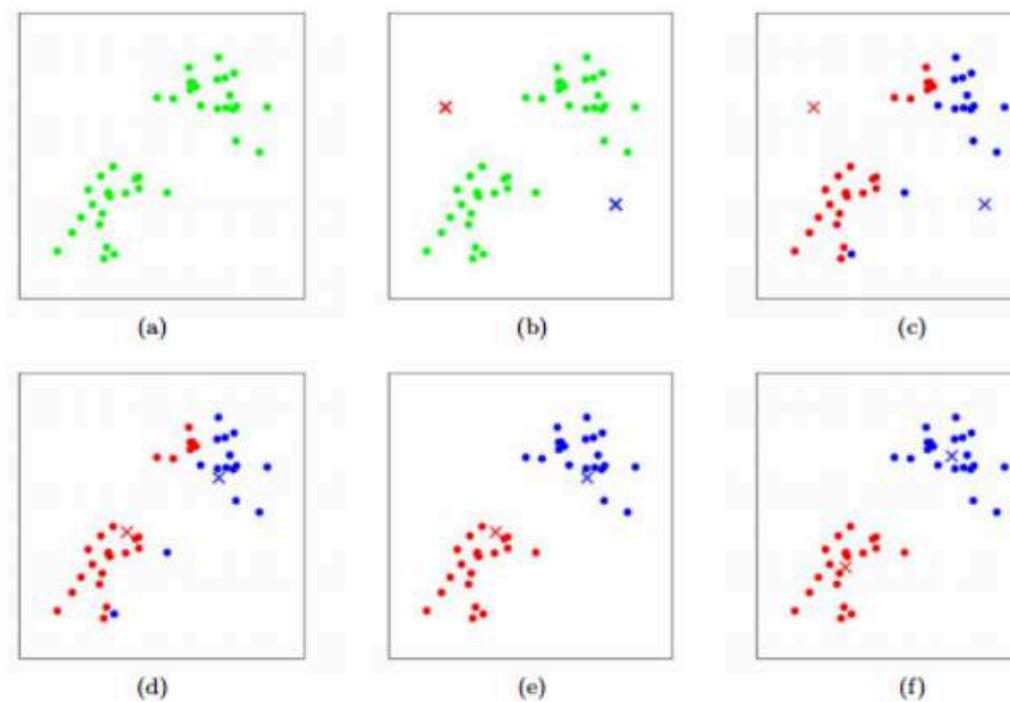


Locations Map



1

K-Means finds the best centroids by alternating between (1) assigning data points to clusters based on the current centroids (2) choosing centroids (points which are the center of a cluster) based on the current assignment of data points to clusters.



k-means clustering

Article Talk

文 28 languages

Read Edit View history Tools

From Wikipedia, the free encyclopedia

Not to be confused with [k-nearest neighbors algorithm](#).

k-means clustering is a method of [vector quantization](#), originally from [signal processing](#), that aims to [partition](#) n observations into k clusters in which each observation belongs to the [cluster](#) with the nearest [mean](#) (cluster centers or cluster [centroid](#)), serving as a prototype of the cluster. This results in a partitioning of the data space into [Voronoi cells](#). **k-means clustering** minimizes within-cluster variances ([squared Euclidean distances](#)), but not regular Euclidean distances, which would be the more difficult [Weber problem](#): the mean optimizes squared errors, whereas only the [geometric median](#) minimizes Euclidean distances. For instance, better Euclidean solutions can be found using [k-medians](#) and [k-medoids](#).

The problem is computationally difficult ([NP-hard](#)); however, efficient [heuristic](#) algorithms converge quickly to a [local optimum](#). These are usually similar to the [expectation–maximization algorithm](#) for mixtures of [Gaussian distributions](#) via an

Part of a series on	
Machine learning and data mining	
Paradigms	[show]
Problems	[show]
Supervised learning (classification • regression)	[show]
Clustering	[show]
Dimensionality reduction	[show]
Structured prediction	[show]
Anomaly detection	[show]
Artificial neural network	[show]

Research

- Find an algorithm for this matter
- Make researches and comparison
- Do it

2



es: Assume we have several locations in campus and several partner's locations. If the location is suggested/desired in the survey, then top 5 +10, to the location has a community fridge already then -8 extra points. If the location is close to a subway station then extra +3 extra points. If the location is close to a partner's (food source) location then extra +3 extra points. If the location has a residence (customer source/high population density) then extra +5 extra points. If the location is close to a potential storage locations then extra +5 extra points. The definition for close is <100m visually.

```
#Set K means
kmeans = KMeans(n_clusters=3, random_state=42)
kmeans.fit(data[:, :2]) # Only use lat and long

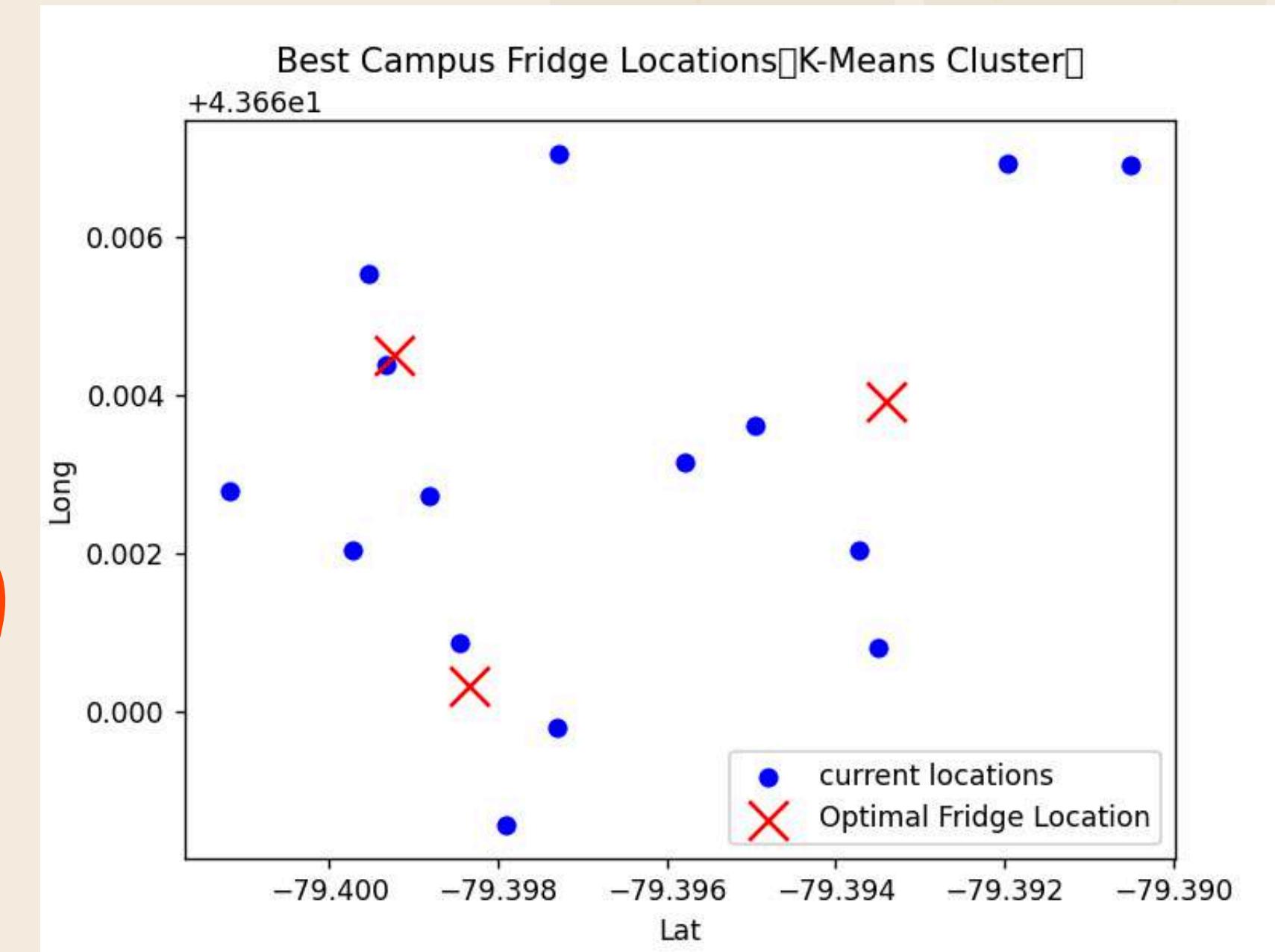
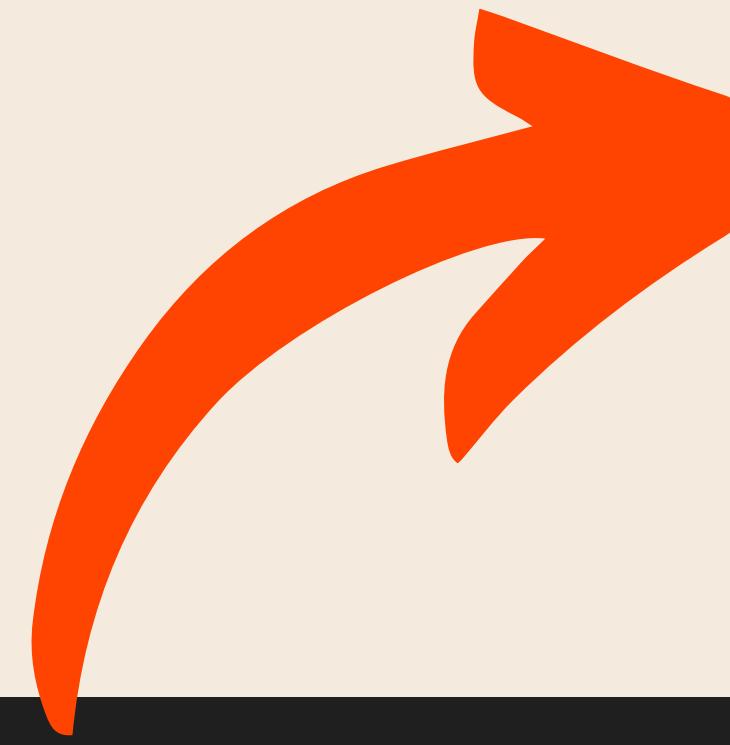
# Get the center of cluster
optimal_fridge_sites = kmeans.cluster_centers_

# Visualization
plt.scatter(data[:, 1], data[:, 0], c='blue', label="current locations")
plt.scatter(optimal_fridge_sites[:, 1], optimal_fridge_sites[:, 0],
           c='red', label="Optimal Fridge Sites")
plt.xlabel("Lat")
plt.ylabel("Long")
plt.legend()
plt.title("Best Campus Fridge Locations (K-Means Cluster)")
plt.show()
```

Program

- Learn to code K-means
- Design weight factors
- Do it

3



```
✓ print(optimal_fridge_sites)
```

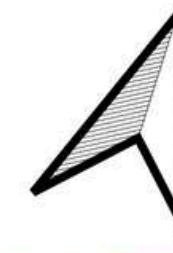
```
[[ 43.66391283 -79.39340433]
 [ 43.6603255  -79.39833825]
 [ 43.6645014  -79.399223 ]]
```

Output

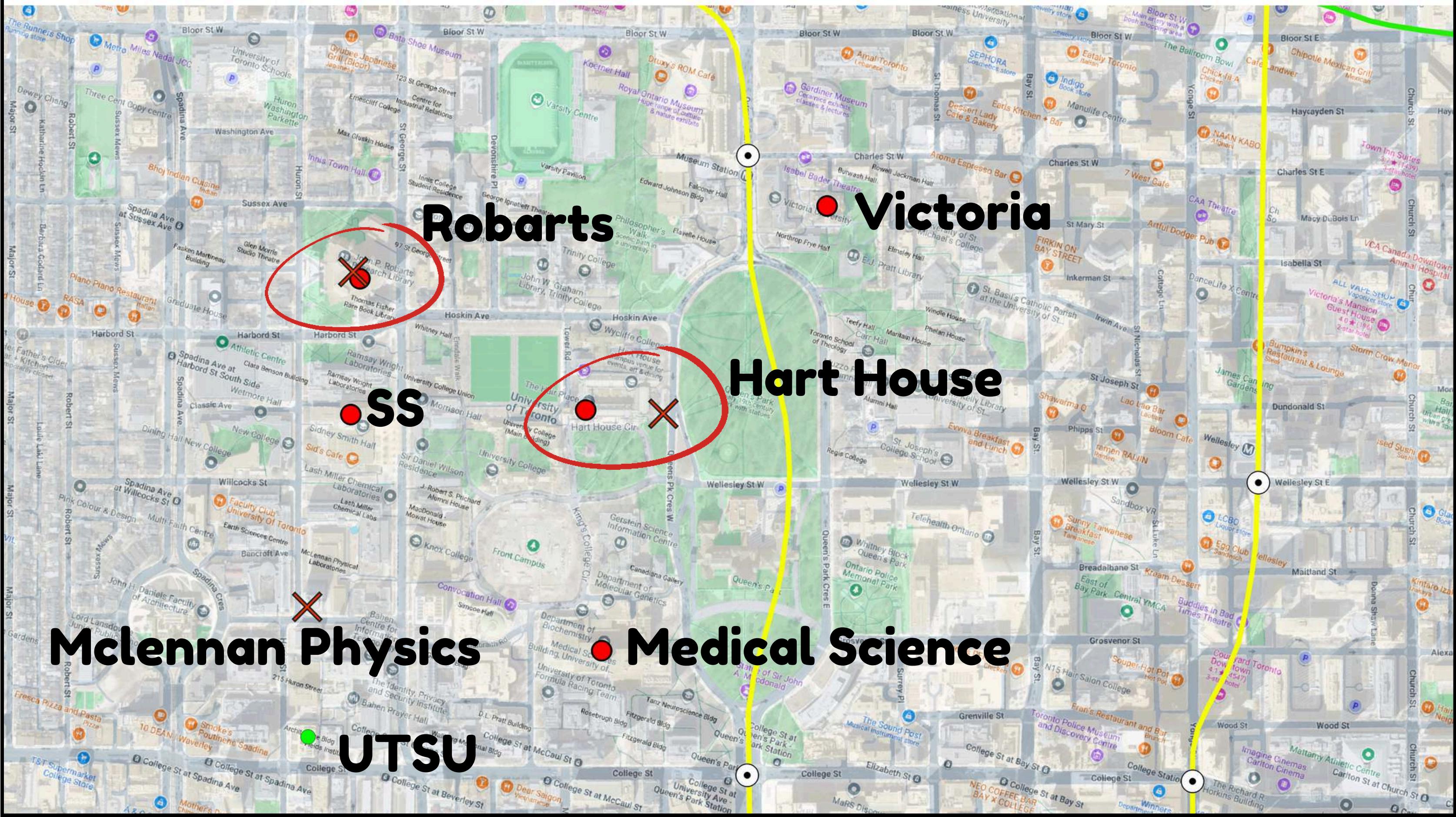
- Run the code
- Combine it with the map
- Do it

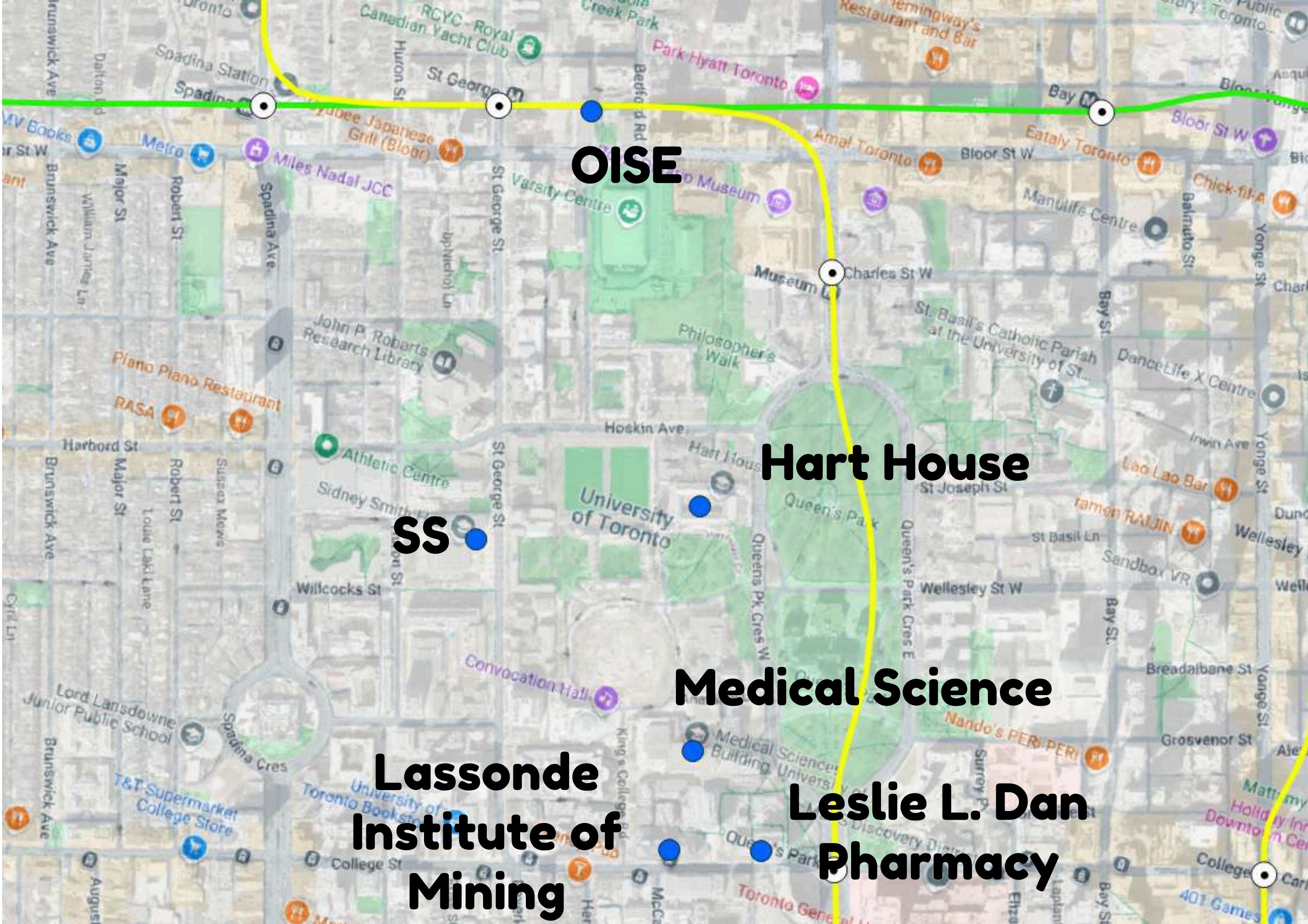
K-Mean Result Map

0 100 200 m



X k_mean_locations
● Survey Fridge Locations





OISE

Hart House

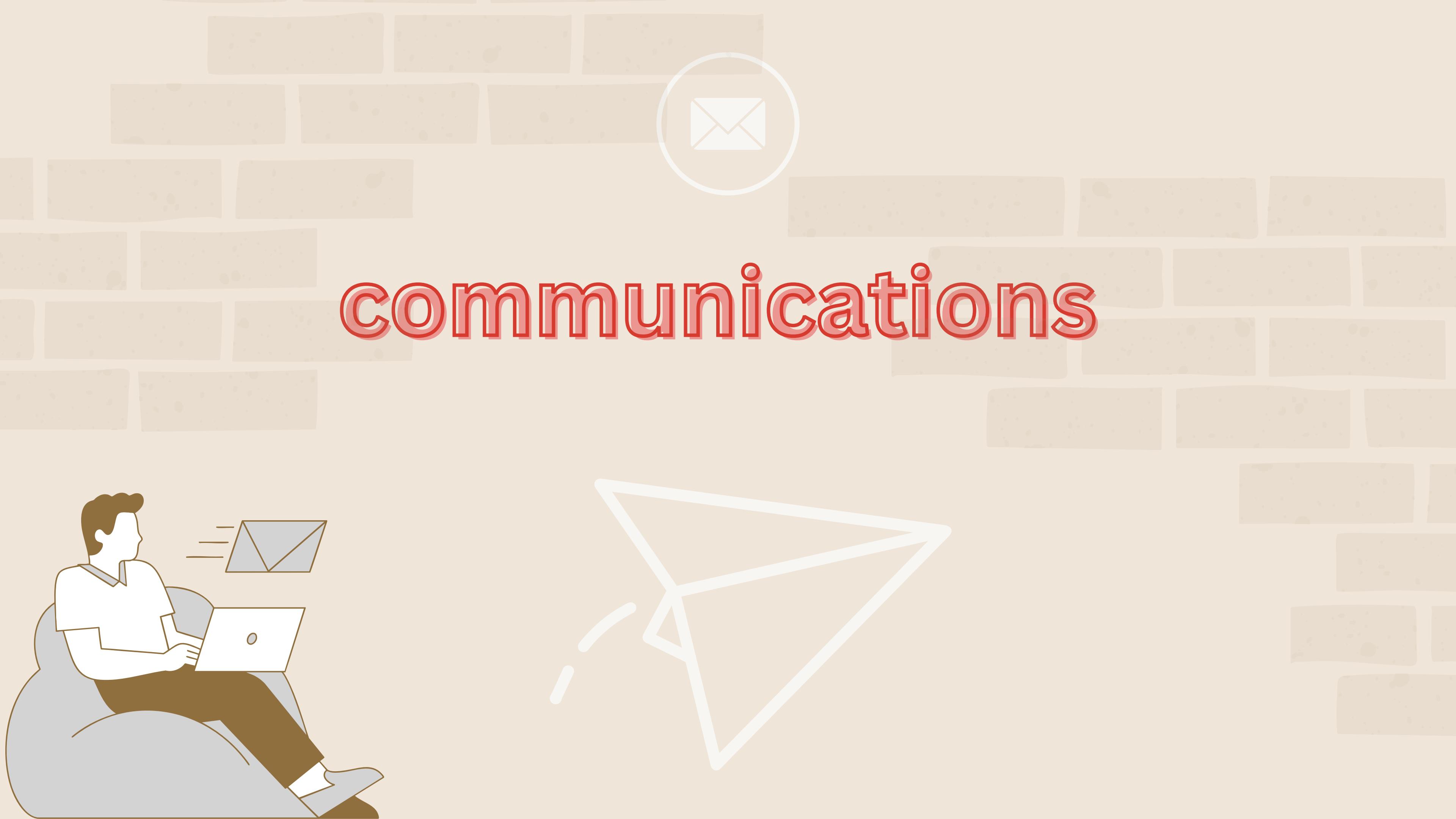
Medical Science

Leslie L. Dan
Pharmacy

Lassonde
Institute of
Mining



Proposed Locations for storage locations



communications



Budget

A	B	C	D	E
1 Category	Items	Quantity	Each cost	Total cost
2 Equipment	Trolleys	3	120	360
3	Weighing Scales	3	100	500
4	Basic Cleaning Products	10	30	300
5	Deck Box	3	300	900
6	Fridges	3	520	1560
7 Security & Accessibility	Locks	3	30	90
8	Signage for fridge locations	10	30	300
9 Logistics & Operations	Reusable food containers	20	20	400
10	Additional shelving inside fridges	10	30	300
11	Trash & compost bins	10	50	500
12 Advertising & Outreach	Posters	50	1	50
13 Staffing & Volunteer Support	volunteer incentives	5	25	125
14	training sessions	3	50	150
15				
16				
17				Total cost:
18				5535
19				
20				

Feedback on the Fridge

I've noticed that the **form** on the meal care fridge in the UTSU (and possibly other locations) **does not get replaced in a timely manner when it is full**, which suggests that the fridges themselves **may not be getting checked often enough by volunteers/folks from the meal care community.**

UTSU has
one on 5th floor
always runs out..

The MealCare fridges are
not currently on the official campus map, I think it could be worth looking into getting the fridges added.

It could be helpful to have more frequent postings on the **Mealcare Instagram** about what is currently in the fridges, so students know what to expect.

Feedback on the Survey

There should be a section on this form where you say if you live with your parents or not, are a commuter/student living on campus (has access to dining hall)/student living off-campus (has even more reduced access to food).

wouldn't be using these fridges but I know they would be **super helpful** for others who would need them!

I think you should include a question about whether people would like to contribute to a community fridge, because while I typically do not need to resources I would love to contribute to provide for others.

Is a community fridge referring to something available in a **fully public space** or rather in a dorm or something?



Thank you for Listening

Comments or Questions?

