

CS 103000  
Prof. Madeline Blount

Week 10:  
OBJECT-ORIENTED  
PROGRAMMING REVIEW!  
& SOCIOTECHNICAL  
SYSTEMS INTRO



*Dall-E 2: cats learning C++ in the forest on '90's technology*



# CLASSES + OBJECTS = NEW PARADIGM

- Procedural programming
- Functional programming
- Object-oriented programming (OOP)
  - *More* abstraction
  - *More* control





## OBJECT ORIENTED = NEW PARADIGM, classes

- Bjarne Stroustrup made C++ with classes in mind
- CLASS = make your own data type
- WHEN make a class?
  - When some data type will repeat
  - When your data will have multiple attributes
  - “Model” something in the world



### Lightbulb

**isOn** (boolean)

**watts** (number)

**turnOn()** (func)



### Microphone

**color** (string)

**isAnalog** (boolean)

**record()** (func)



### Animal

**color** (string)

**age** (number)

**speak()** (func)



### Date

**month** (number)

**year** (number)

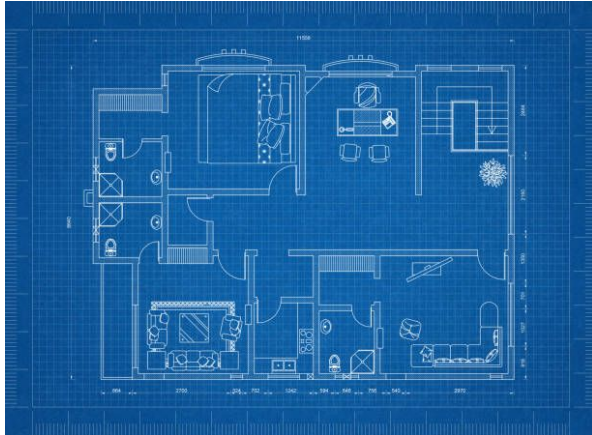
**toString()** (func)

# CLASS vs. OBJECT

- Class is the blueprint; object is an INSTANCE of the class

CLASS

blueprint



OBJECT

building





# CLASS vs. OBJECT

- Class is the blueprint; object is an INSTANCE of the class

CLASS

cookie cutter



OBJECT

cookie

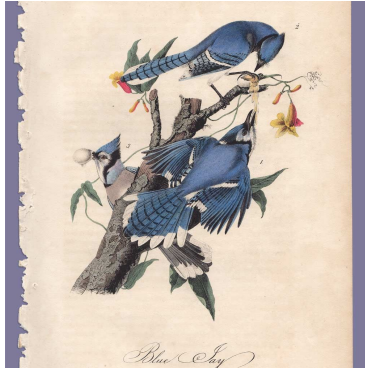


# CLASS vs. OBJECT

- Class is the blueprint; object is an INSTANCE of the class

CLASS

species



OBJECT

Actual birds in the world



# MAKING A CLASS

- Class definition
- Attributes, or member data (what are the THINGS that define the objects in this class? Size, name, color, rate, cost, etc.)
- Methods, or member functions (what are the things you can DO with the objects in this class)





# FILE STRUCTURE

imagine class called Movie...



main.cpp

#include



Movie.h

Class encapsulation,  
(attributes, member  
data, declarations)

#include



Movie.cpp

Class methods  
(function  
definitions)

compile: `g++ main.cpp Movie.cpp`



# *STRENGTH in COMMUNITY*

## Crown Heights Mutual Aid

Join a network of neighbors  
providing for one another

CROWN HEIGHTS MUTUAL AID is a network of neighbors supporting one another and the most vulnerable in our community in the face of this pandemic and the crises we face from climate change, state violence, and inequality. We all have something to offer and we all have something we need.

Join us at [crownheightsmutualaid.com/slack](https://crownheightsmutualaid.com/slack) or on Facebook at Crown Heights Mutual Aid

### What we had:

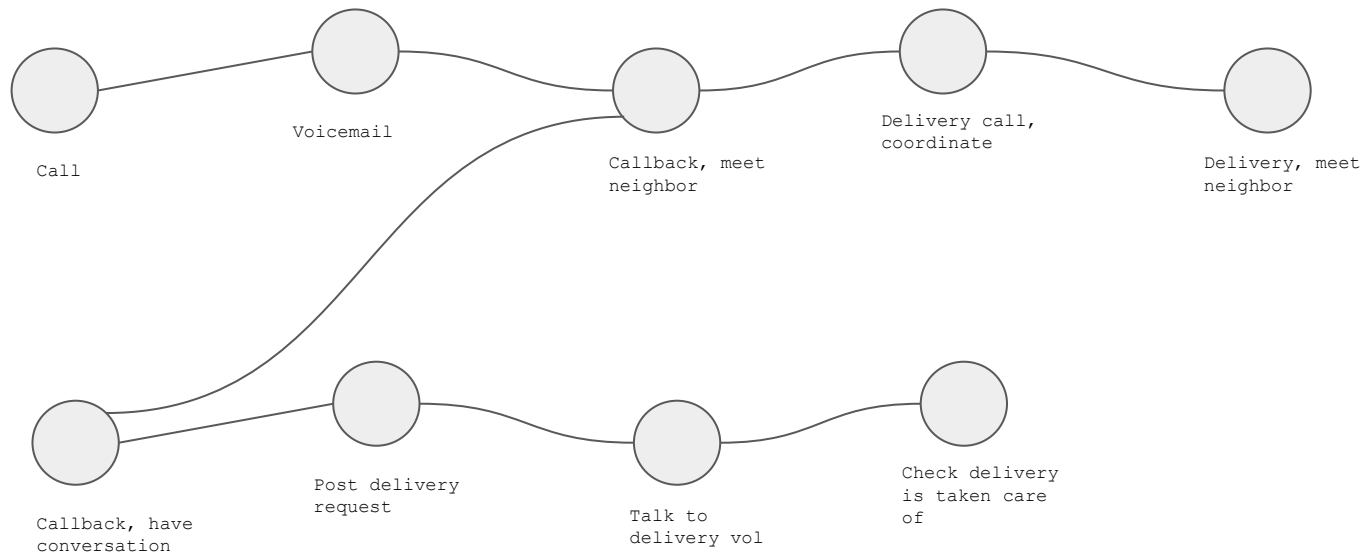
- **Need** list (growing) - turning to new places, everything shut
- **Volunteer base** (growing) - time, interest: delivery, phone calls, donations
- **Technical** savvy, for some (Slack, Facebook, Twitter, etc. - so much time on these platforms)
- **Small team** of coders (3-20), larger group using system
- **Security minded**

### What we needed:

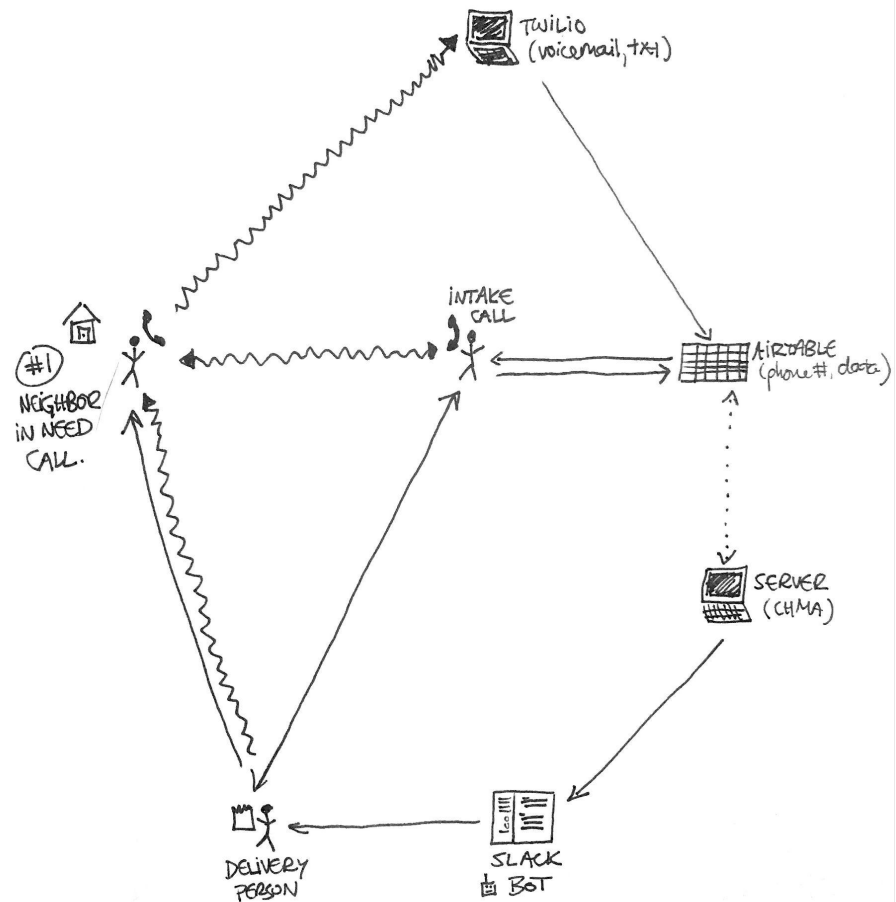
- Way to **connect** local neighbors in need with local neighbors able to give

## Systems/JOURNEYS: user/data

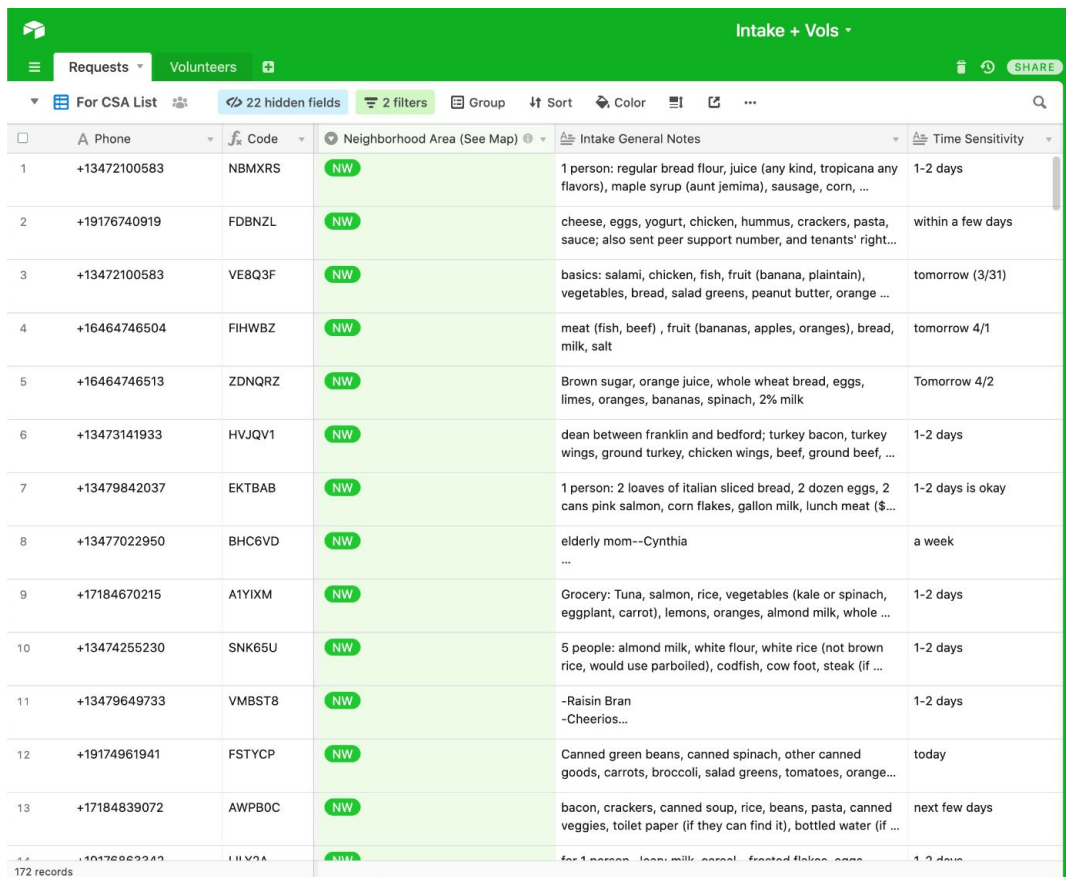
### [Neighbor in Need]



### [Intake Volunteer]



## Step 2: database, intake



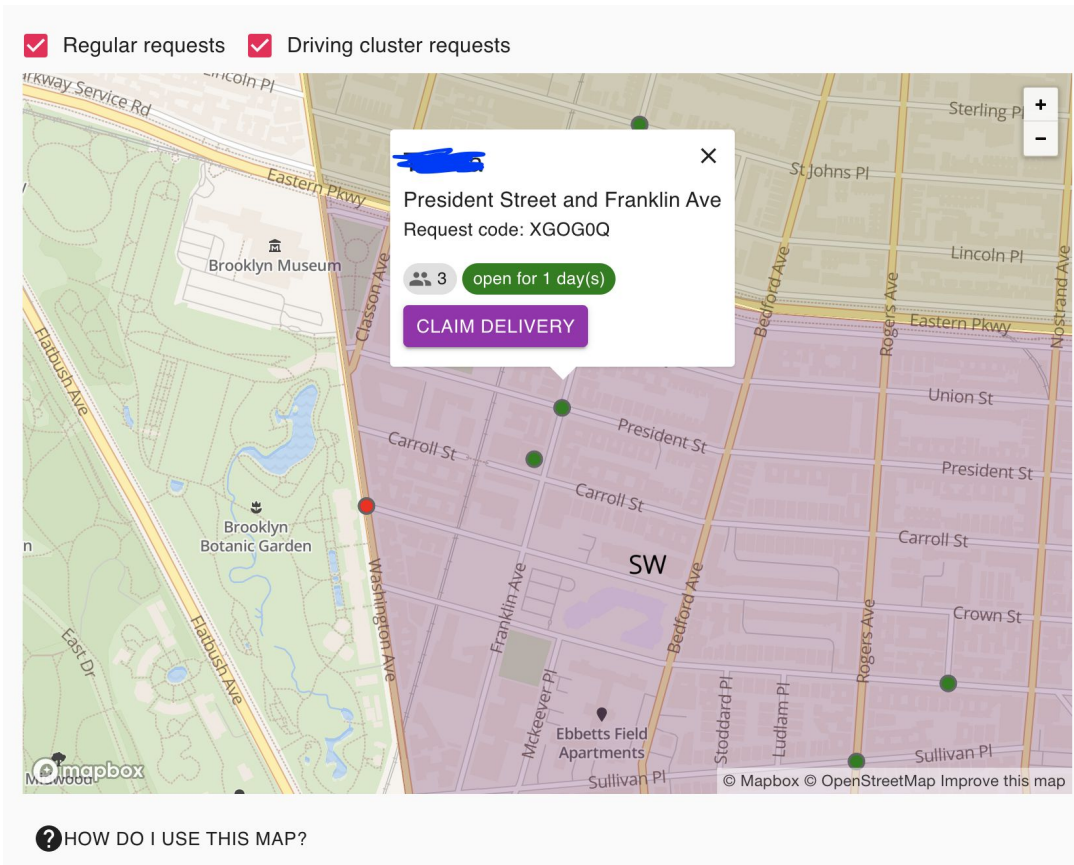
	Phone	Code	Neighborhood Area (See Map)	Intake General Notes	Time Sensitivity
1	+13472100583	NBMXRS	NW	1 person: regular bread flour, juice (any kind, tropicana any flavors), maple syrup (aunt jemima), sausage, corn, ...	1-2 days
2	+19176740919	FDBNZL	NW	cheese, eggs, yogurt, chicken, hummus, crackers, pasta, sauce; also sent peer support number, and tenants' right...	within a few days
3	+13472100583	VE8Q3F	NW	basics: salami, chicken, fish, fruit (banana, plantain), vegetables, bread, salad greens, peanut butter, orange ...	tomorrow (3/31)
4	+16464746504	FIHWBZ	NW	meat (fish, beef) , fruit (bananas, apples, oranges), bread, milk, salt	tomorrow 4/1
5	+16464746513	ZDNQRZ	NW	Brown sugar, orange juice, whole wheat bread, eggs, limes, oranges, bananas, spinach, 2% milk	Tomorrow 4/2
6	+13473141933	HVJQV1	NW	dean between franklin and bedford; turkey bacon, turkey wings, ground turkey, chicken wings, beef, ground beef, ...	1-2 days
7	+13479842037	EKTBAB	NW	1 person: 2 loaves of italian sliced bread, 2 dozen eggs, 2 cans pink salmon, corn flakes, gallon milk, lunch meat (\$...	1-2 days is okay
8	+13477022950	BHC6VD	NW	elderly mom--Cynthia ...	a week
9	+17184670215	A1YIXM	NW	Grocery: Tuna, salmon, rice, vegetables (kale or spinach, eggplant, carrot), lemons, oranges, almond milk, whole ...	1-2 days
10	+13474255230	SNK65U	NW	5 people: almond milk, white flour, white rice (not brown rice, would use parboiled), codfish, cow foot, steak (if ...	1-2 days
11	+13479649733	VMBST8	NW	-Raisin Bran -Cheerios...	1-2 days
12	+19174961941	FSTYCP	NW	Canned green beans, canned spinach, other canned goods, carrots, broccoli, salad greens, tomatoes, orange...	today
13	+17184839072	AWPBOC	NW	bacon, crackers, canned soup, rice, beans, pasta, canned veggies, toilet paper (if they can find it), bottled water (if ...	next few days
14	+19176862242	LLY2A	NW	for 1 person: brown milk, cereal, frosted flakes, eggs...	1-2 days

172 records

- “Intake” volunteer, uses the **relational** database (Airtable) like a call sheet; unique code generated
- First connection made: neighbor in need to neighbor on the phone (shifts, parties)
- Fills out fields that are empty from phone conversation
- **DATA SECURITY:** vulnerable; but only keeps first names, and cross street
- Volume ...



## Version 2.0 delivery system: web map

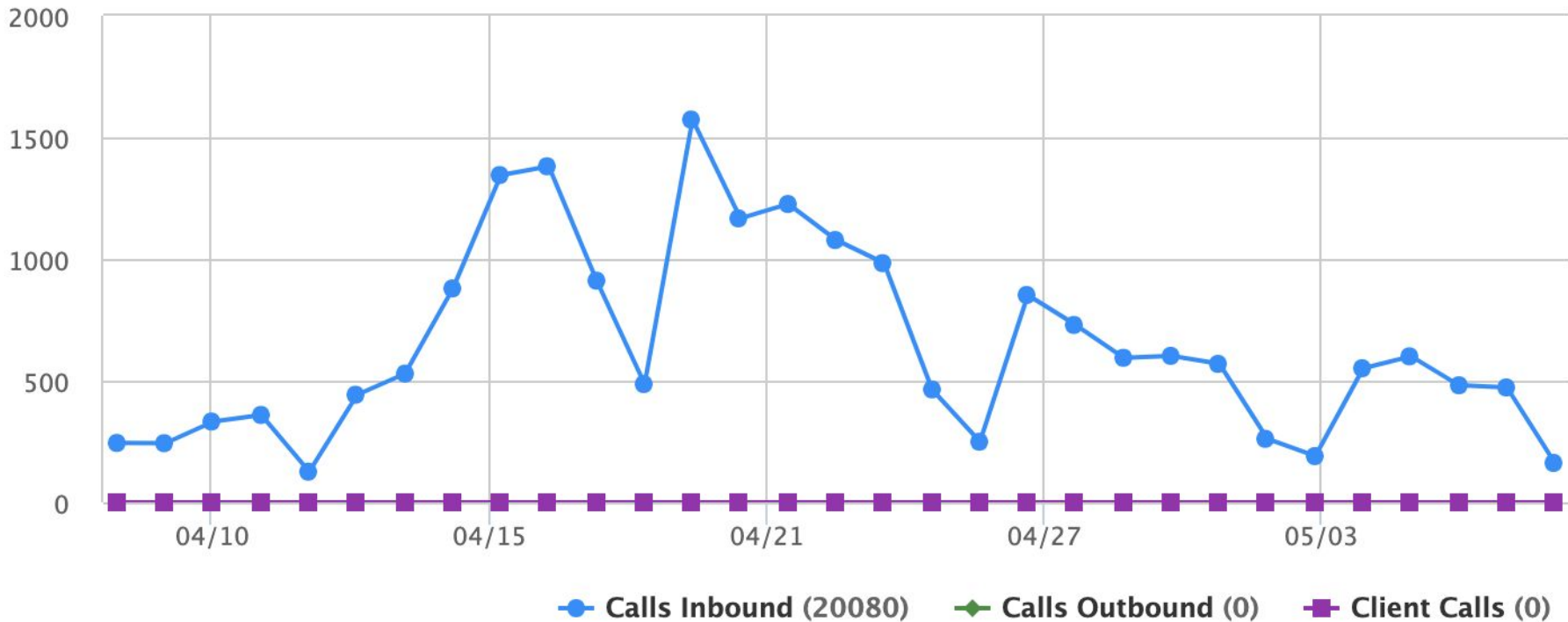


- When intake volunteer changed status column in Airtable to "Needs Delivery" call sent to endpoint on Node.js server
- Used Google Maps API to geolocate cross streets, place them on web map (front-end: Mapbox)



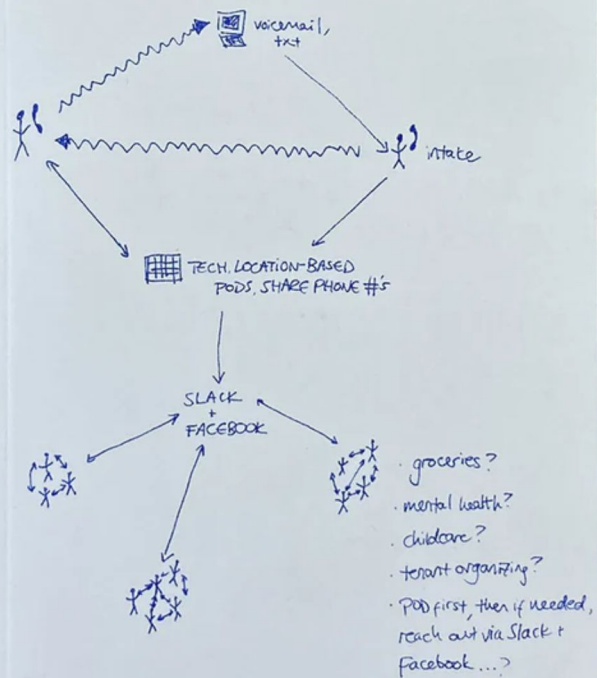
Calls

Last 30 Days ▾



# Rehearsing Solidarity

## Learning from Mutual Aid



**WE THE PEOPLE  
MUST HELP  
EACH OTHER!**





# FILE STRUCTURE

imagine class called Neighbor



main.cpp

#include



Class encapsulation,  
(attributes, member  
data, declarations)

Neighbor  
.h

#include



Neighbor.c  
pp

Class methods  
(function  
definitions)

compile: `g++ main.cpp Neighbor.cpp`





# CONSTRUCTOR

- object initialization function, runs automatically
- declared in **public** encapsulation
- Funny definitions syntax ... **DOES NOT HAVE RETURN TYPE!**

example: class named Neighbor

```
Neighbor::Neighbor() {  
  
}
```