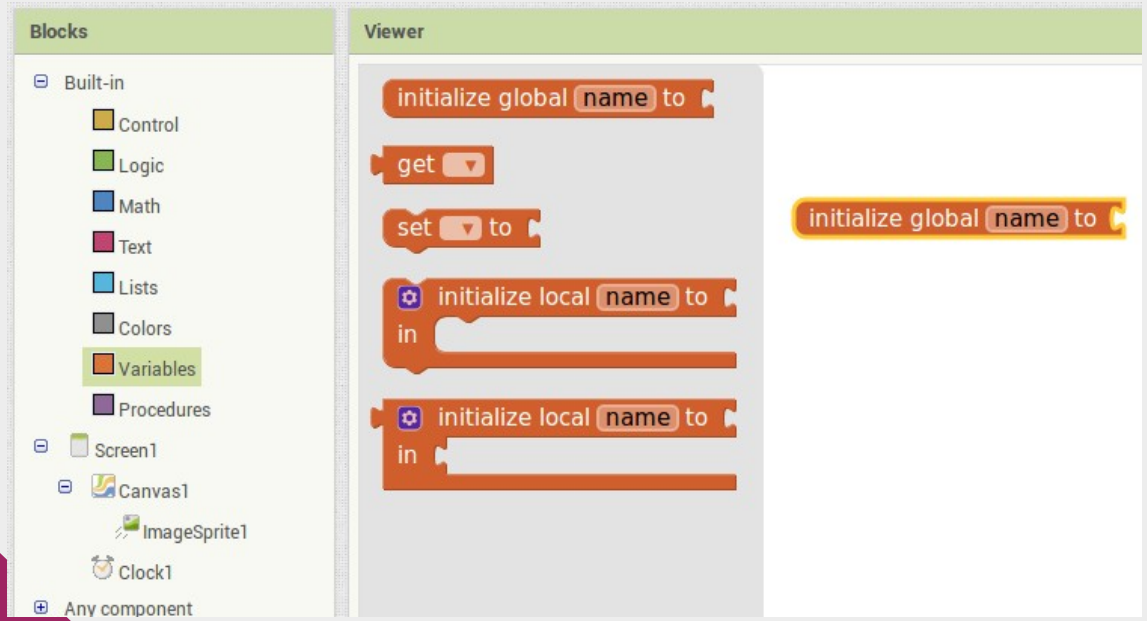
APP Design (Day 3)

- Review
- Problem Solving
- Detecting motion
- Sending SMS
- Inter-app communications
- Map
- Mini-Project

MIT APP INVENTOR

Review

- What do we use variables for?



Review

- The score is a value that can change
- In computer programming, we store such values in a **variable**

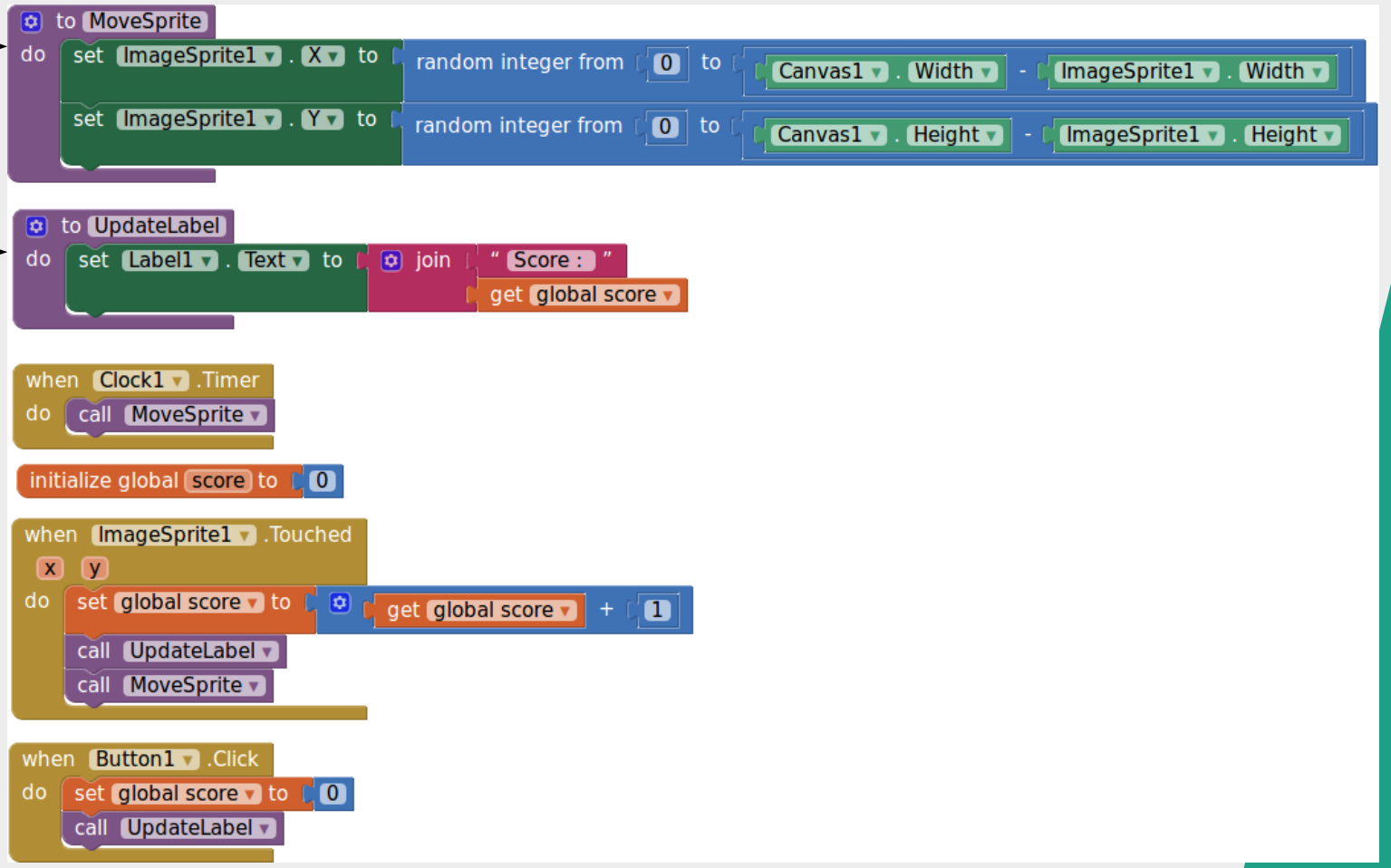
Variables
Nearly all programming languages have variables.

Variables can store numbers, text, boolean, and many more.

Review

What is this?

Or this?

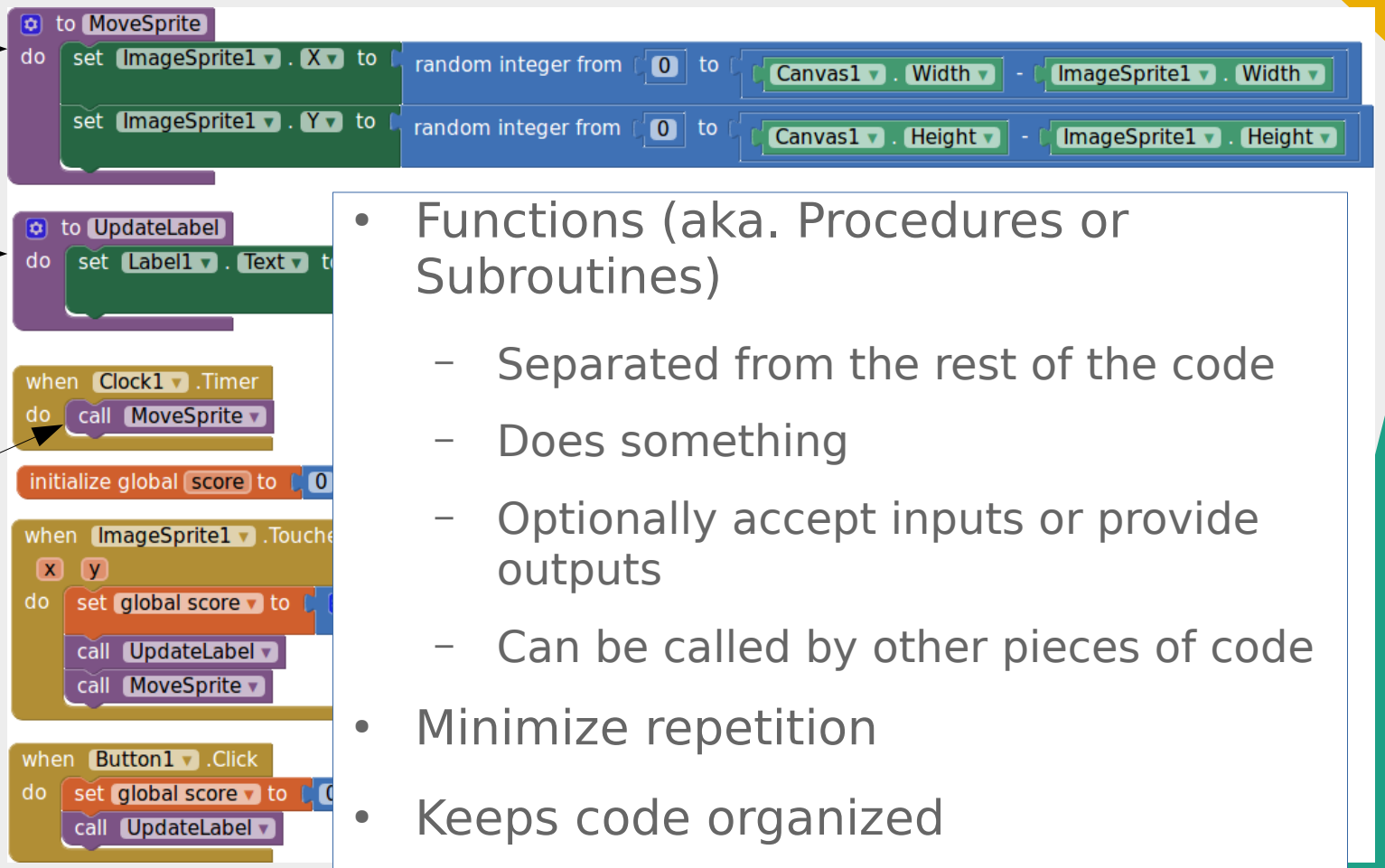


Review

This is a function...

This one too...

Calling of a function

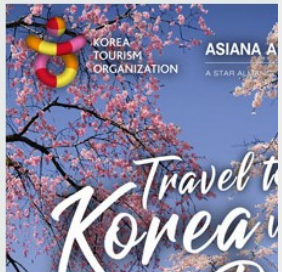


- Functions (aka. Procedures or Subroutines)
  - Separated from the rest of the code
  - Does something
  - Optionally accept inputs or provide outputs
  - Can be called by other pieces of code
- Minimize repetition
- Keeps code organized

Can these be prevented?

Man dies after suffering heart attack while jogging in Macritchie

A jogger in his 50s was found lying motionless along the MacRitchie Nature Trail near Singapore Island Country Club. PHOTO:



Steve Cram's brother dies while jogging

by CLARE KITCHEN, Daily Mail

The brother of athletics hero Steve Cram collapsed and died while out jogging, it has emerged. He was 39

Kevin Cram, 39, a fitness fanatic, was running alone near his home in Cardiff when he suffered a suspected heart attack.

He was found slumped by the roadside on Tuesday evening by a passer-by and taken to hospital.

Solving the problem

1) Problem Selection
   (I've done this for you...)
2) Understand the problem
   (Read, Research, Talk to experts...)
3) Define the problem
4) Ideate (...think of a solution)
5) Prototype
6) Test!

Time to Work

- Understand the problem
  - Search online about similar cases
  - Learn about heart attacks and how to prevent or treat them
- Define the problem
  - You can’t stop a heart attack, so it’s not meaningful to say that “heart attacks” are the problem
  - What then is the problem?
- **You have 10 mins to work on this**

Understand the Problem

- Best time to treat a heart attack is within one to two hours of the first onset of symptoms
- 90% to 95% of heart attack victims who reach the hospital survive
- Victims often discovered late

Define the Problem

- Heart attack victims are not found until it is too late
- Especially for joggers in isolated areas
- Need a way to notify others that a heart attack (...or other emergencies) has occured

Ideate

- Create an app that...
  - Detects when the user is not moving for sometime
  - Notify others of your location
  - Display location on a map

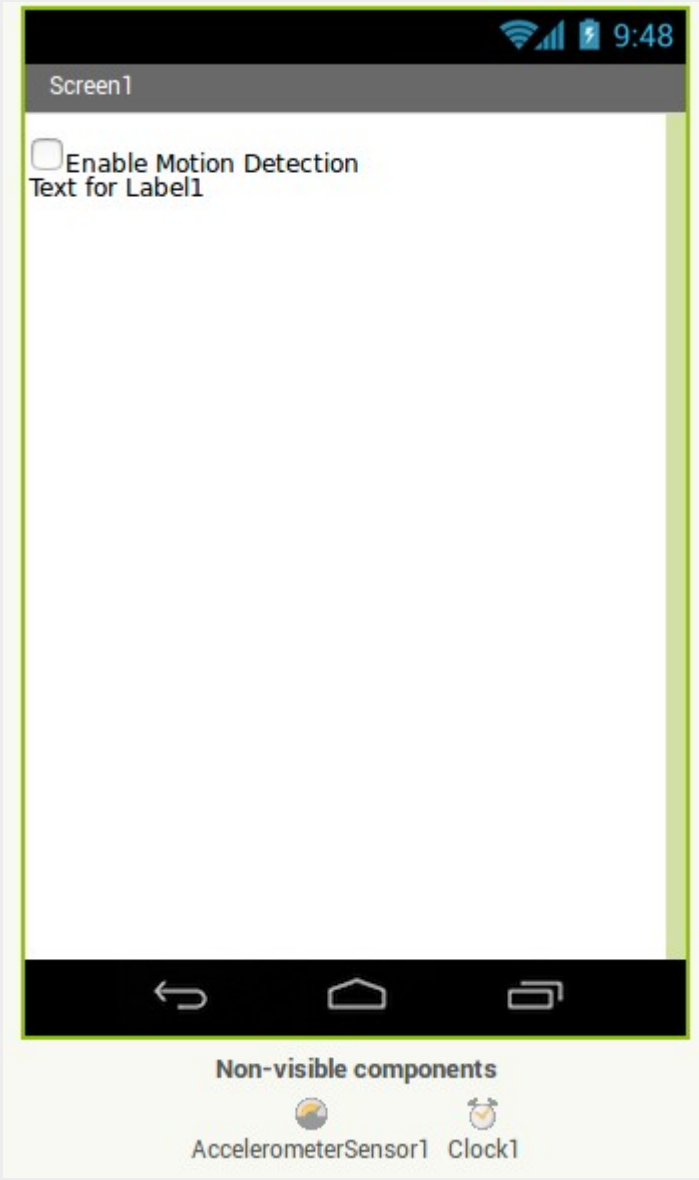
Prototype

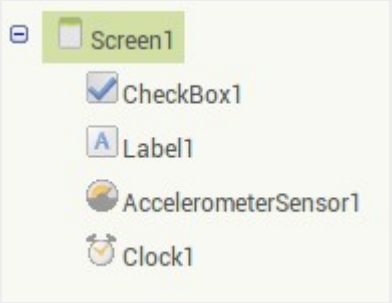
- When prototyping, don’t try to do everything at once
- Add features in gradually

Detect Motion

Add in...

- Checkbox (enable or disable motion detection)
- Label (for testing)
- Accelerometer (Detects motion)
- Clock (Measure time)

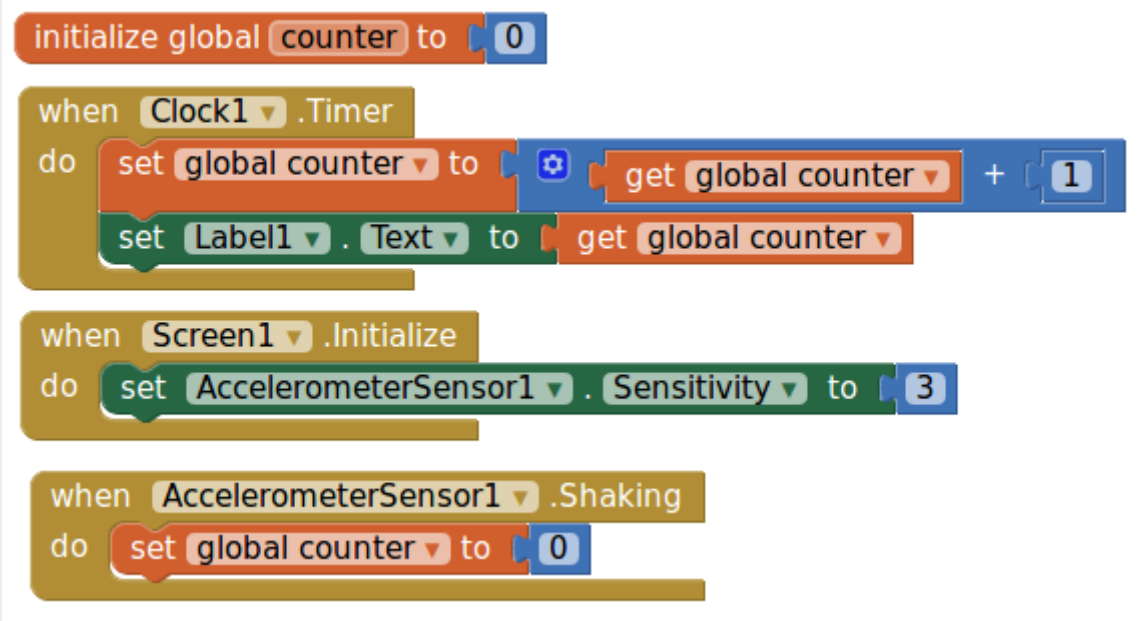




Detect Motion

In the blocks editor...

- Use a **variable** to track how many seconds has passed and display on screen
- Reset to zero when the phone is shaken
- Set sensitivity to 3 (high)



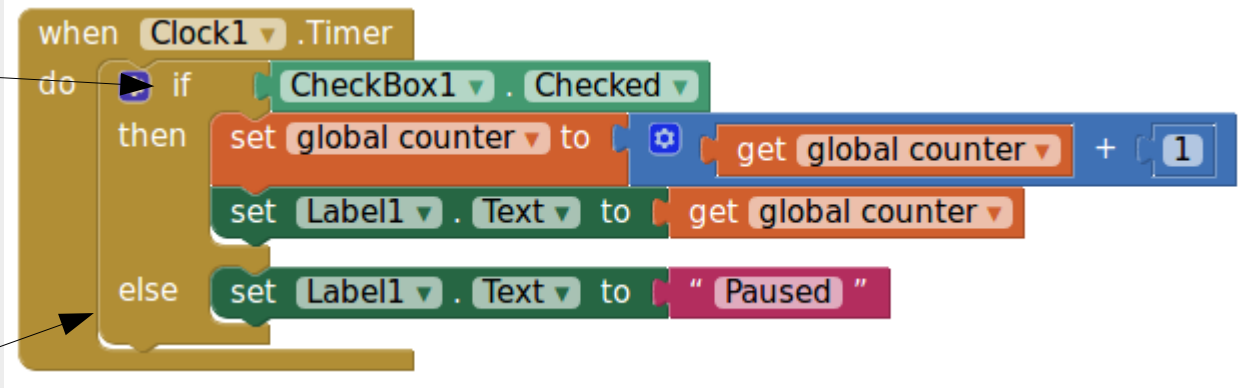
Challenge

- We haven’t used the checkbox yet
- Change the program, so that the counter only increases if the checkbox is checked
- Hint: Use an “if” block

Solution

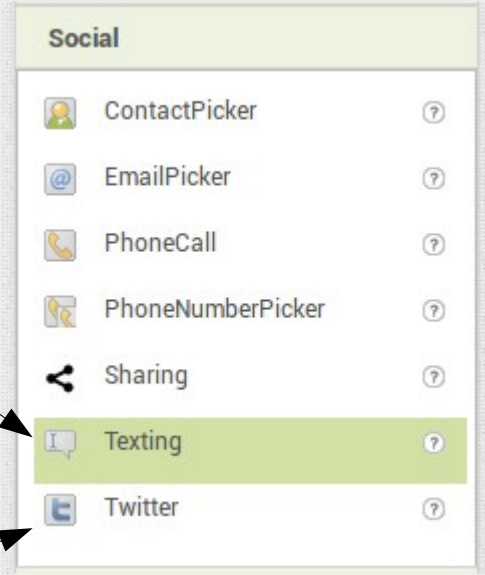
Only increase the counter if checkbox is checked...

...else we'll set the text to "Paused". (optional)



Calling for Help

Add in a “Texting” component. This is used for sending SMS.



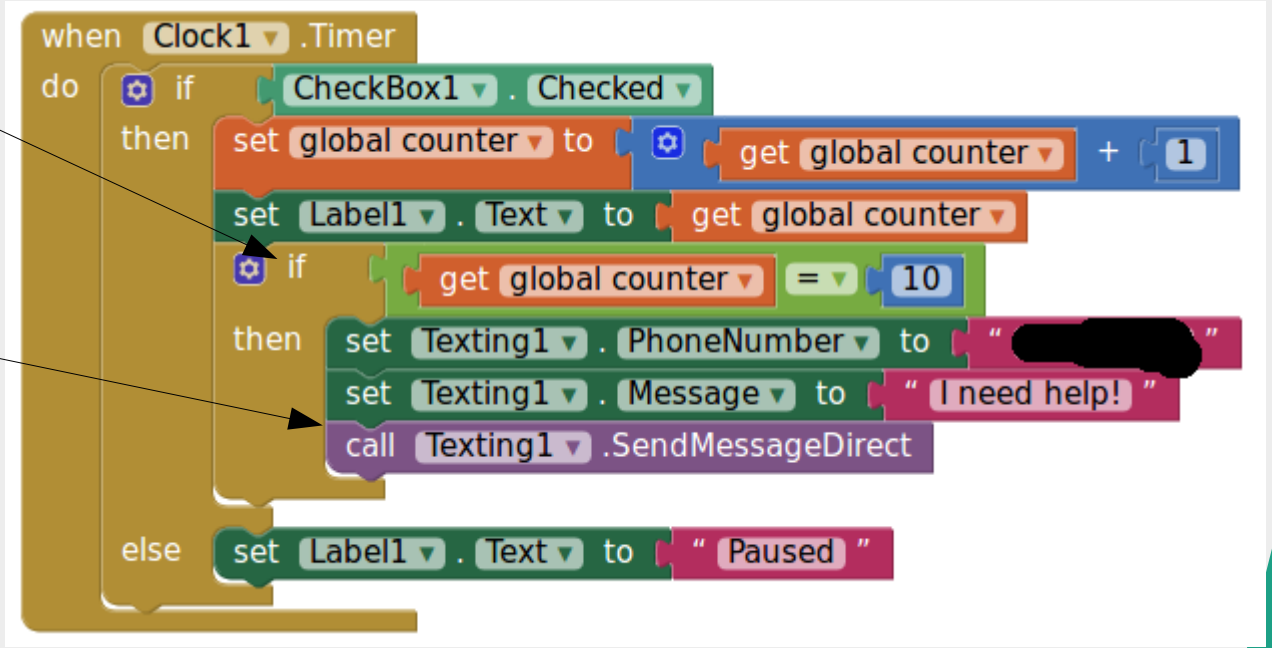
…calling for help via Twitter… probably won’t be as effective. But it’s up to you.

Calling for Help

When the counter reaches 10...

...set the phone number and message, and send the SMS directly

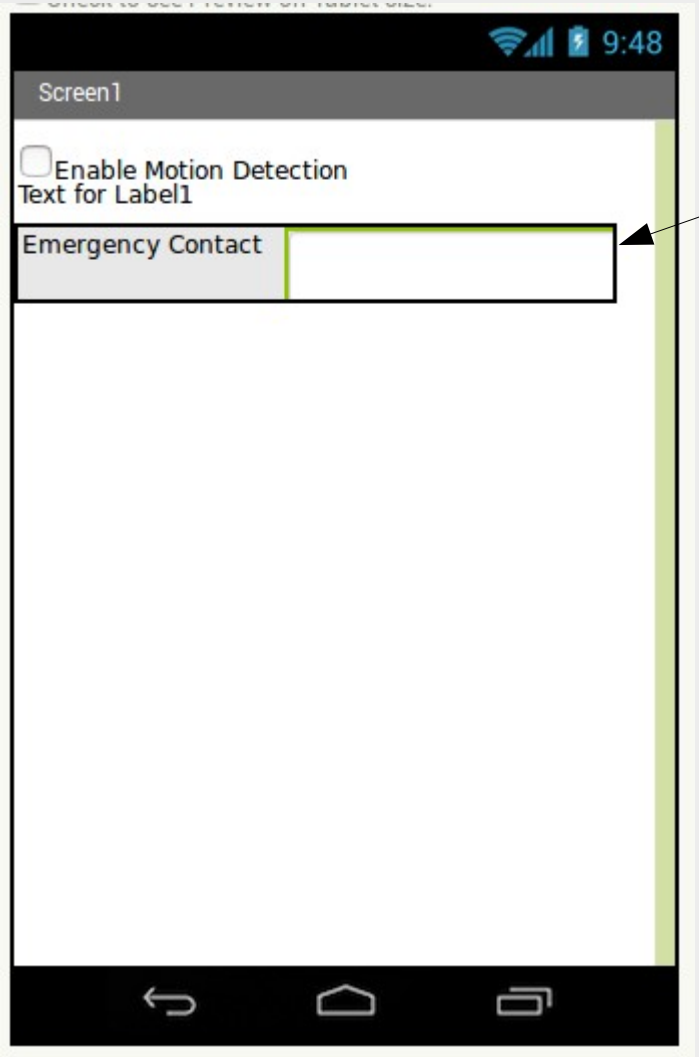
Note:
You may need to enable the SMS permission for App Inventor



Challenge

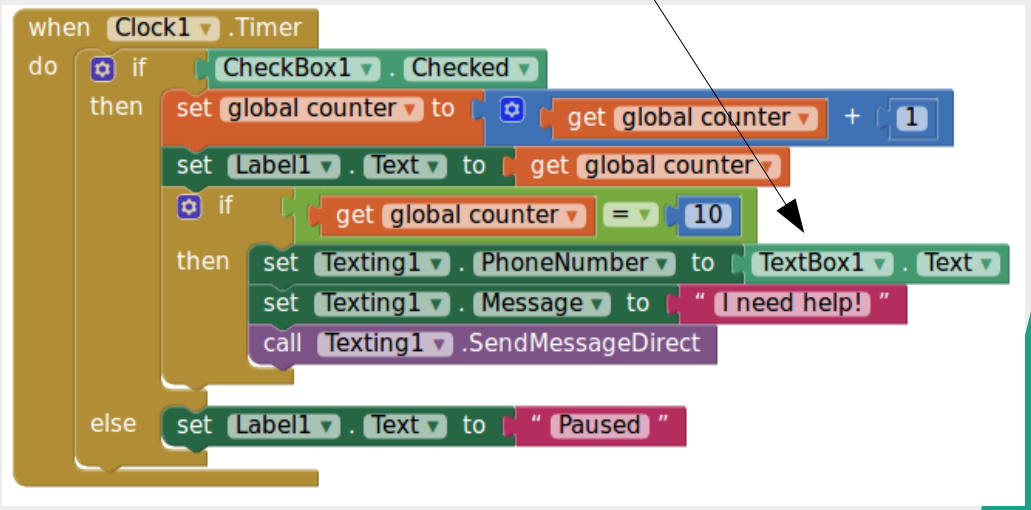
- The phone number is fixed in the program
- Change the program to allow the user to set the phone number
- Optionally, allow the user to set their own message as well
- Hint: You'll need to add a textbox

Solution



Add a textbox...

...and use the textbox value to set the phone number



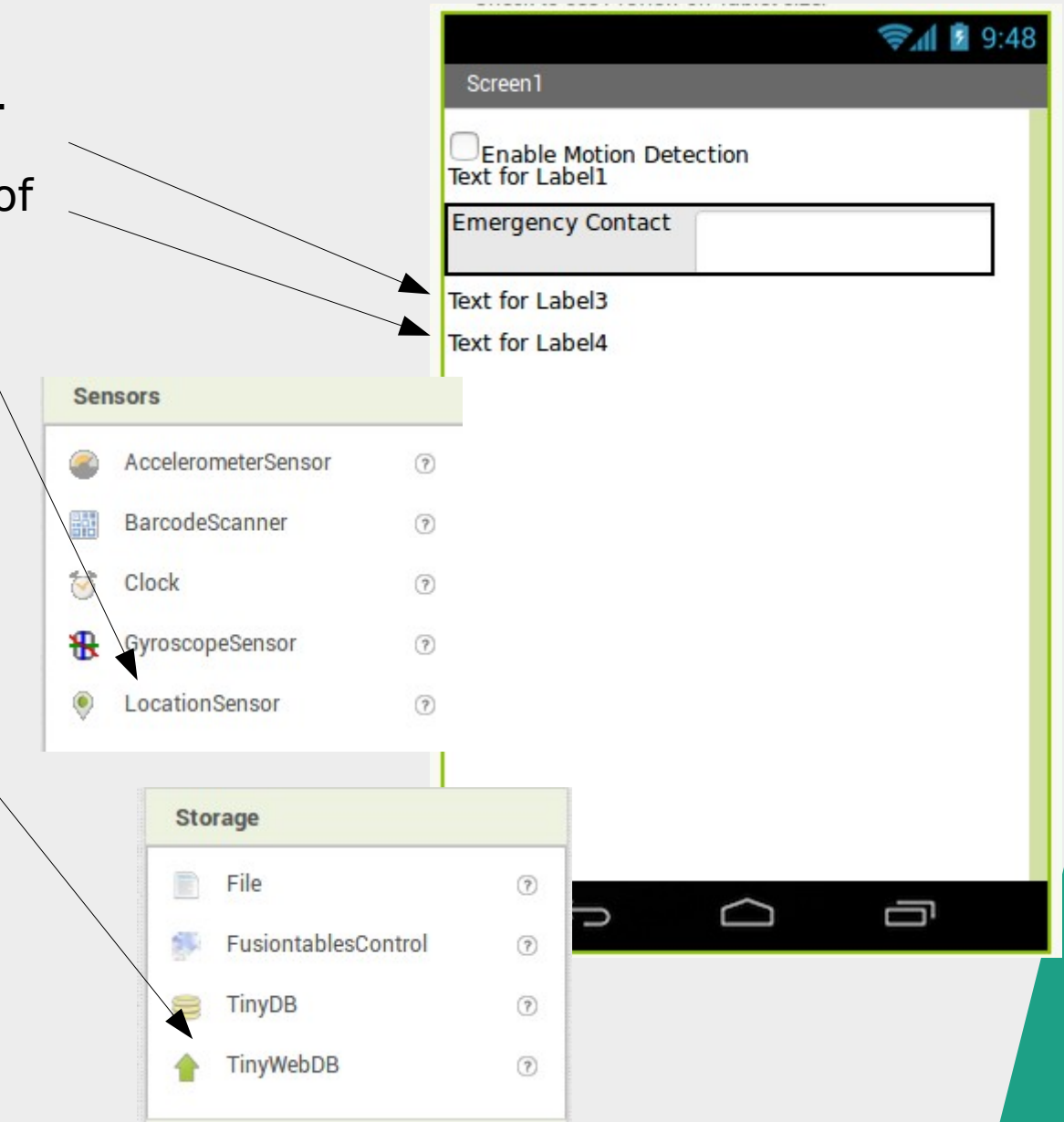
Upload Location

Add in two more labels. We'll use it to display latitude and longitude of the victim.

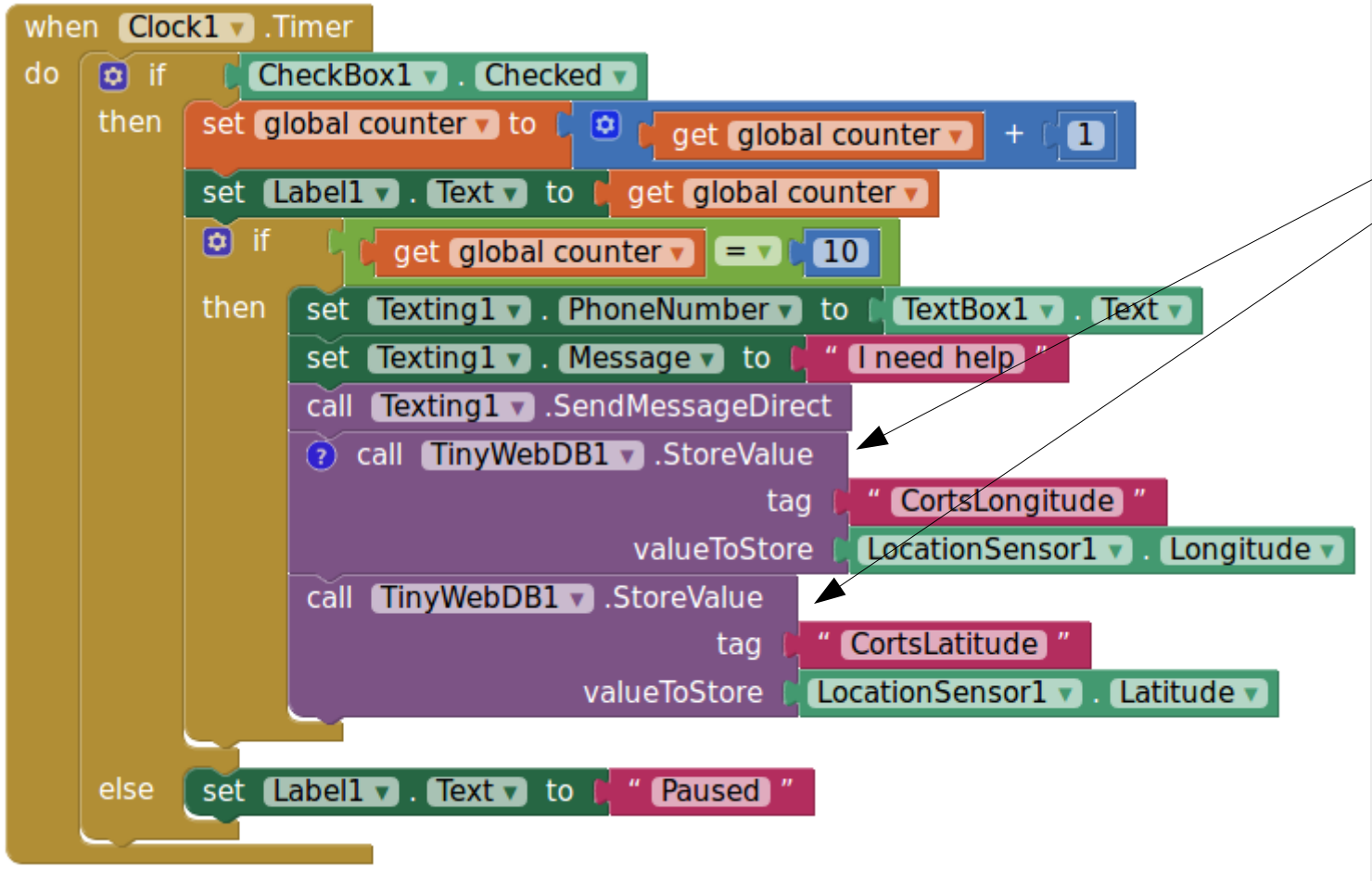
Add in a "LocationSensor" component (under sensors)

Add in a TinyWebDB component (non-visible).

This is a shared storage. Anything that you store in this database is visible to everyone. You can use this to communicate between different phones.



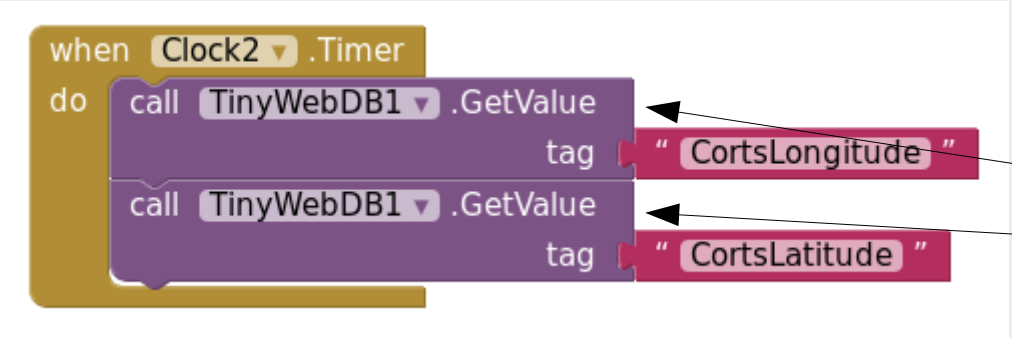
Upload Location



Upload location to server

Make sure you have a unique tag!

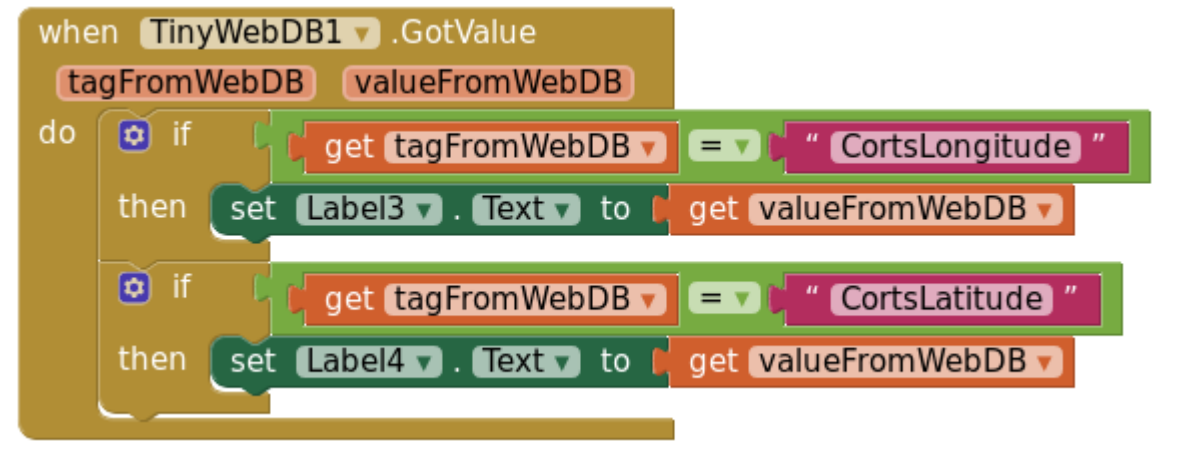
Retrieve Location



Create a new timer and set it to 5 seconds.

Every 5 seconds, we'll request for the location using the same tag.

This is normally done using another phone, but we'll use the same phone for testing purposes.

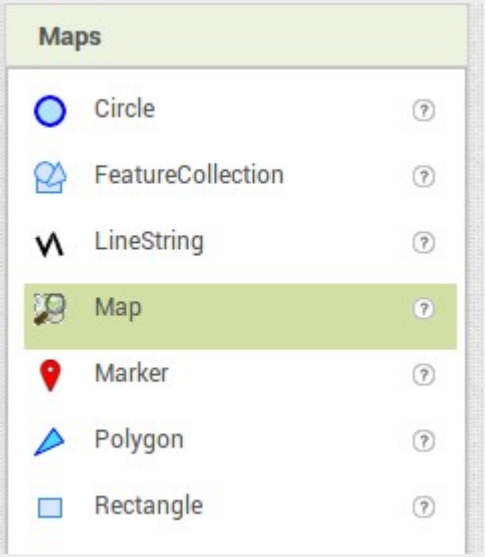


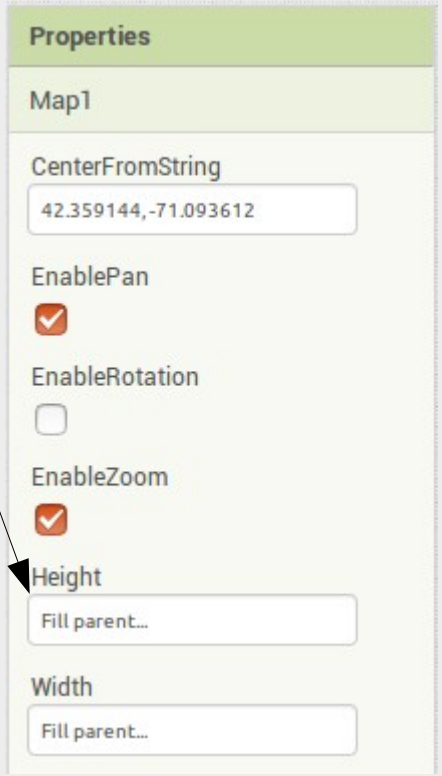
When we got the data, we'll set it into the label

Display on Map

Add in a Map

Adjust the properties to make it as large or small as you like



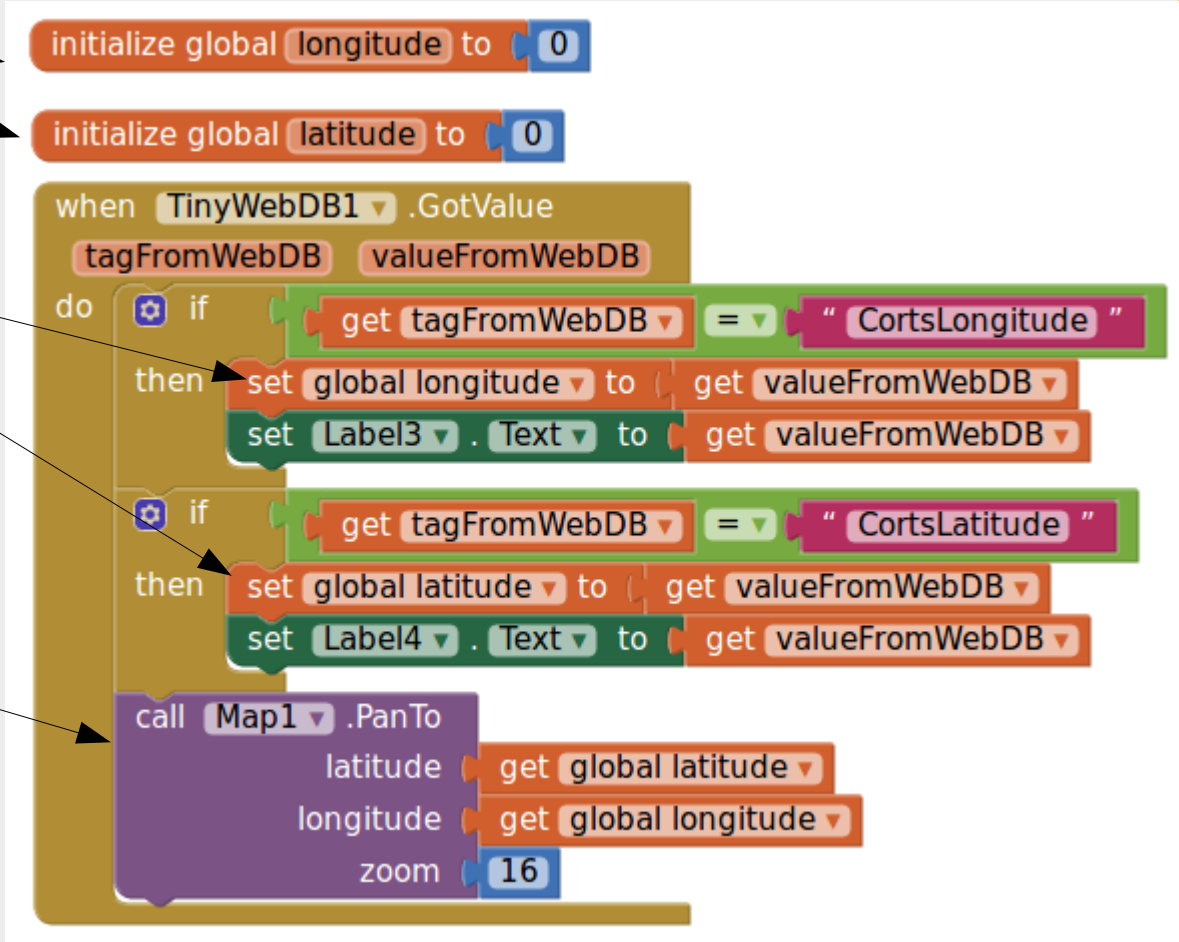


Display on Map

Create two new variables

Save the longitude and latitude to these variables

Pan the map to the location (Play around with the zoom to see what it means)



Mini Project

Polishing up an App

- The app works, but is really rough and simple. Can you add in...
  - A manual “Call for help” button?
  - Only show the map if there’s a request for help?
  - Add a marker to the emergency location?
- Test the app thoroughly. There are many more bugs and shortcomings. See if you can find and fix them.