

# Empowering Social Change by Teaching Code

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## COMMENTARY EDUCATION

# The real reason U.S. students lag behind in computer science

Marie desJardins

Oct 22, 2015



New York City Mayor Bill de Blasio recently announced that the city is investing \$81 million to establish computer science instruction in every public school in the city by 2025. This announcement is impressive, but hardly surprising to those of us who have been watching the computer science education landscape evolve rapidly over the last eight years. Interest in computer science (CS) at the university level declined after the “dot-com bust” of 2000, but then came back with a vengeance in 2007. Since then, student enrollment in computer science has been increasing.

## RELATED



As a professor of computer science who has worked extensively to improve CS education at the K-12, undergraduate and graduate levels, I know there are many more who want to go into the field of computer science. The numbers of female students and racial

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# 1. CS education is lacking

10% NYC schools  
1% NYC students

2. CS curricula are outdated

has faculty who possess the necessary expertise and have access to appropriate computing facilities. The course represents college-level achievement for which many colleges and universities grant advanced placement and credit. Placement and credit are granted by institutions in accordance with their own policies, not by the College Board or the AP Program.

## **T H E   C O U R S E**

The AP Computer Science A course is an introductory course in computer science. The major theme of the course is problem solving. The topic outline on pages 8–10 summarizes the content required in the AP Computer Science A course.

### **Goals**

The goals of the AP Computer Science A course are comparable to those in the introductory course for computer science majors offered in many college and university computer science departments. It is not expected that all students in the AP Computer Science A course will major in computer science at the university level. The AP Computer Science A course is intended to serve both as an introductory course for computer science majors and as a course for people who will major in other disciplines and want to be informed citizens in today’s technological society.

The following goals apply to the AP Computer Science A course. Students should be able to:

- design, implement, and analyze solutions to problems.
- use and implement commonly used algorithms.
- use standard data structures.
- develop and select appropriate algorithms and data structures to solve new problems.
- write solutions fluently in an object-oriented paradigm.
- write, run, test, and debug solutions in the Java programming language, utilizing standard Java library classes and interfaces from the AP Java subset.

3.  
skill mastery  
vs.  
creativity

# 4. inaccessible

5.  
creators of tech

≠

people who use tech

< 15% black & latino

26% women



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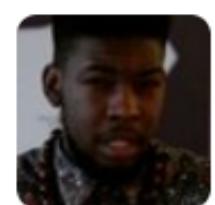


# Solutions to the World's Biggest Problems Are Within Our Reach

By Darlene Damm and Nicholas Haan - Aug 17, 2016    15,827

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accessible to all

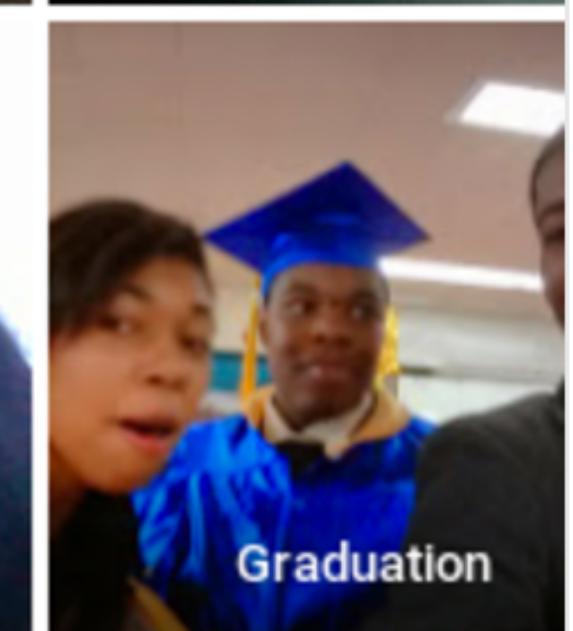
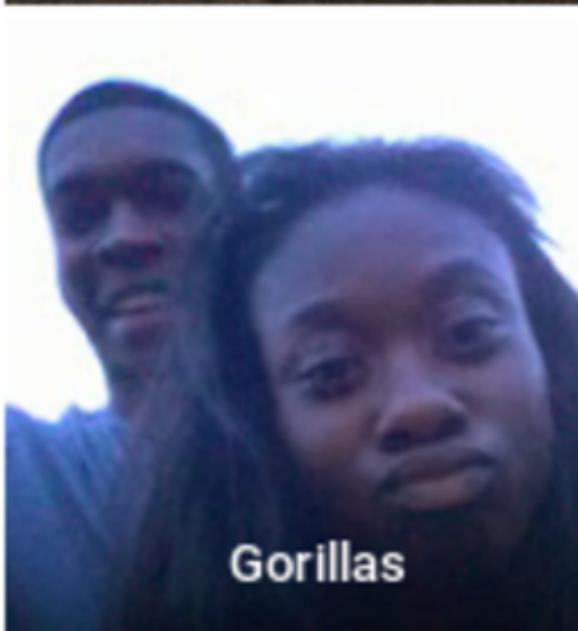
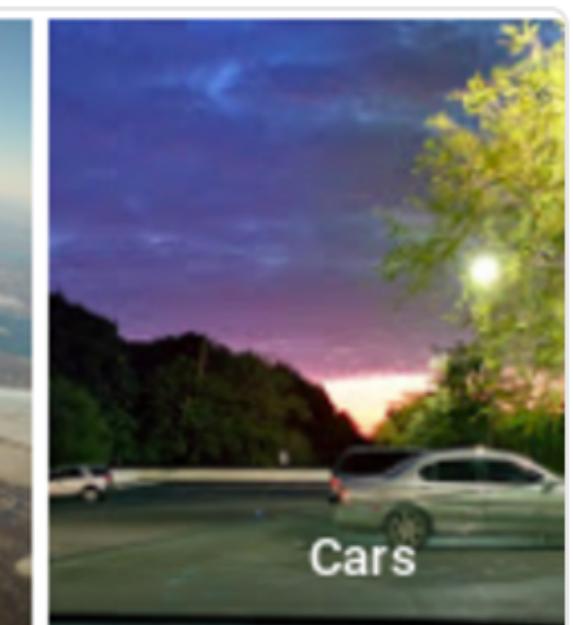
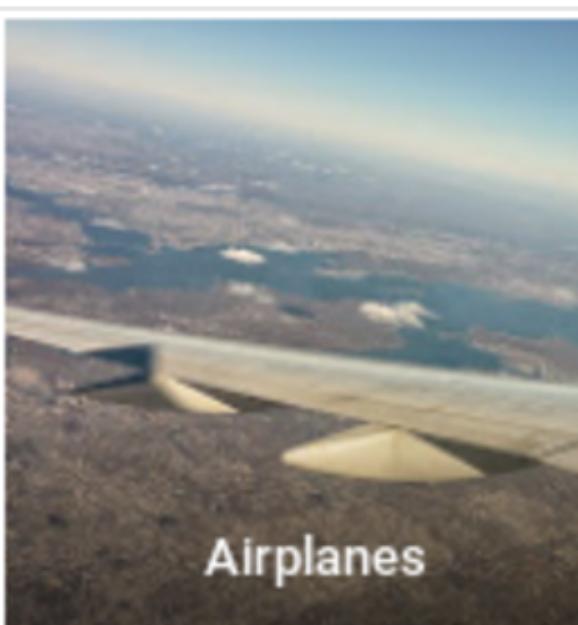


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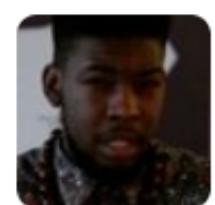
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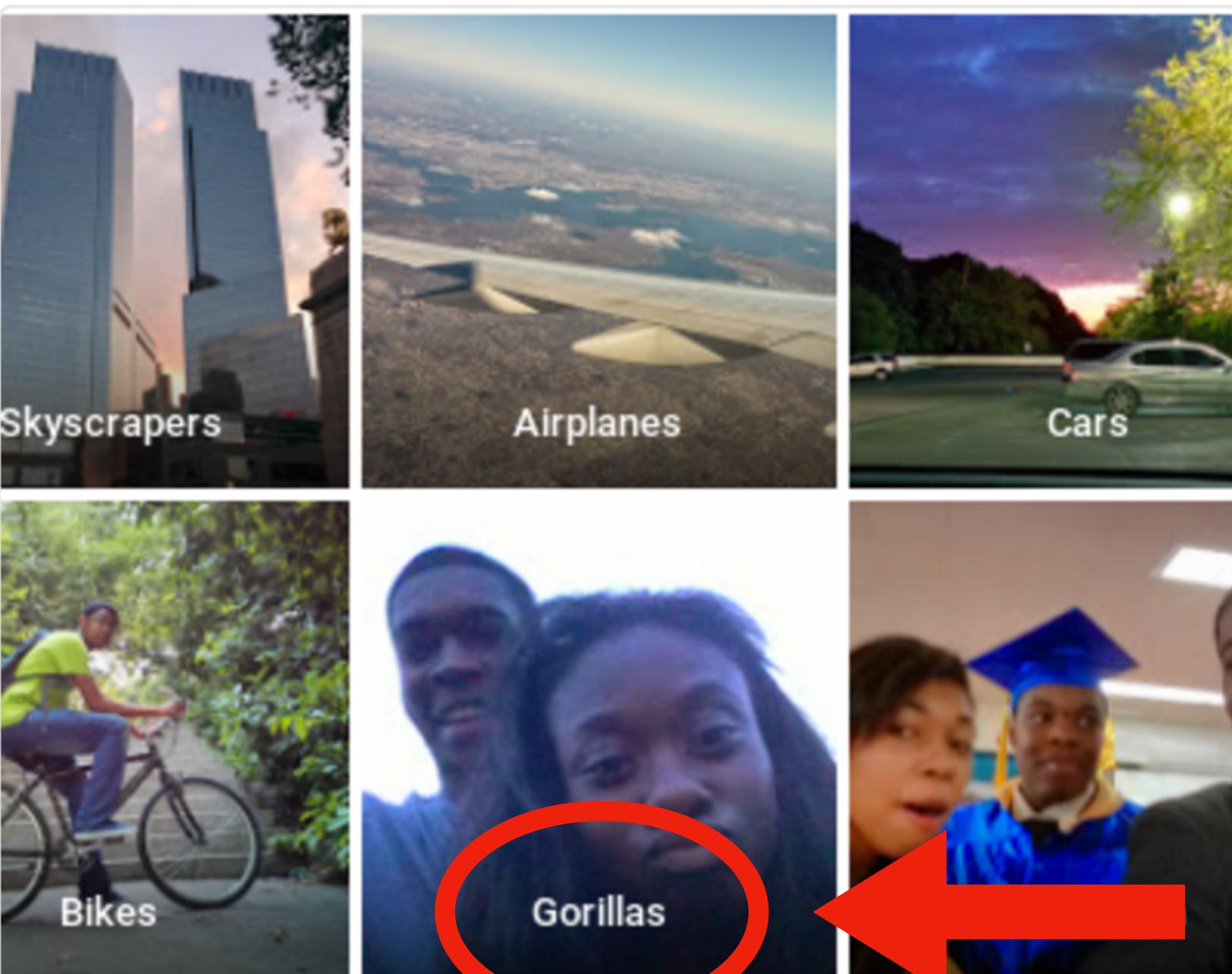


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subvert the traditional curriculum

## Definition [ edit ]

The factorial function is formally defined by the product

$$\begin{aligned} n! &= \prod_{k=1}^n k \\ &= 1 \cdot 2 \cdot 3 \cdots (n-2) \cdot (n-1) \cdot n \\ &= n(n-1)(n-2) \cdots (2)(1) \end{aligned}$$

initially for integer  $n \geq 1$ , and resulting in this fundamental recurrence relation:

$$(n+1)! = (n+1) \cdot n!$$

E.g.:

$$5! = 5 \cdot 4!$$

$$6! = 6 \cdot 5!$$

$$50! = 50 \cdot 49!$$

In order for this recurrence relation to be extended to  $n=0$ , it is necessary to define

$$0! = 1$$

so that



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# The Time Is Now



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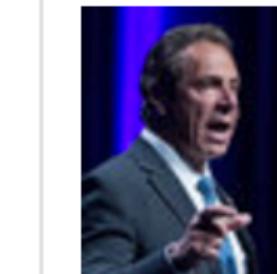
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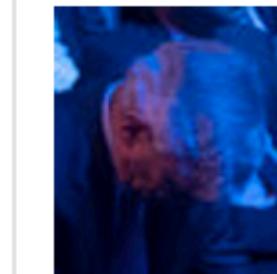
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# *De Blasio to Announce 10-Year Deadline to Offer Computer Science to All Students*

By KATE TAYLOR and CLAIRE CAIN MILLER SEPT. 15, 2015



To ensure that every child can learn the skills required to work in New York City's fast-growing technology sector, [Mayor Bill de Blasio](#) will announce on Wednesday that within 10 years all of the city's public schools will be required to offer computer science to all students.

Meeting that goal will present major challenges, mostly in training enough teachers. There is no state teacher certification in computer science, and no pipeline of computer science teachers coming out of college. Fewer than 10 percent of city schools currently offer any form of computer science education, and only 1 percent of students receive it, according to estimates by the city's [Department of Education](#).

## RECENT COMMENTS

**Karen B.** September 17, 2015  
The mayor should stop setting goals and actually work to get things done. So many good ideas, so little follow through. Police reform? No....

**April** September 17, 2015  
Of the many vast issues our young need to be prepared for in the future they face, particularly environmental issues, this mayor decided...

**joeshuren** September 17, 2015  
Better to concentrate not on coding but on mathematics,



HOME · BLOG

# Computer Science For All

JANUARY 30, 2016 AT 6:05 AM ET BY MEGAN SMITH



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**Summary:** Learn about President Obama's bold new initiative to empower a generation of American students with the computer science skills they need to thrive in a digital economy.

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In the coming years, we should build on that progress, by ... offering every student the hands-on computer science and math classes that make them job-ready on day one.

- President Obama in his 2016 State of the Union Address

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Tynker is a leader in Computer Science education that has been used by over 34 million kids to start learning [...]

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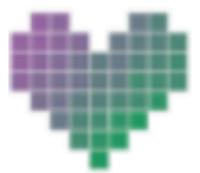
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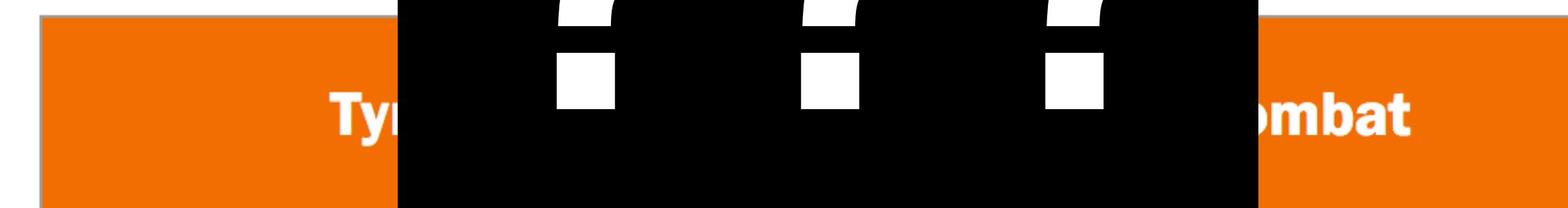


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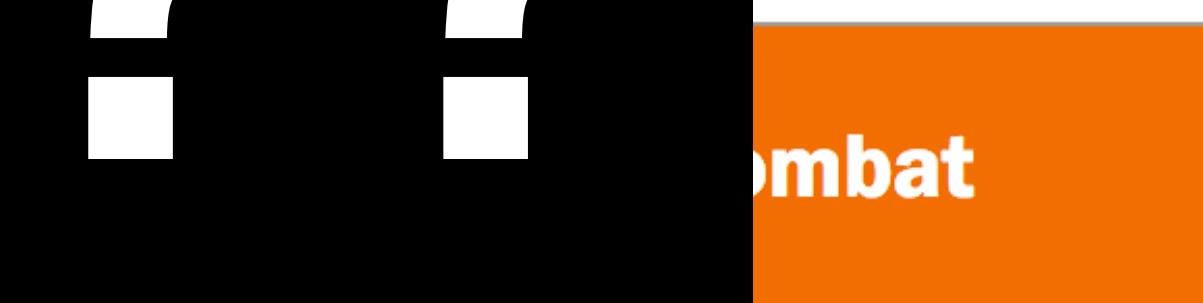
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greatness in programming  
can come from  
anywhere



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code for social good

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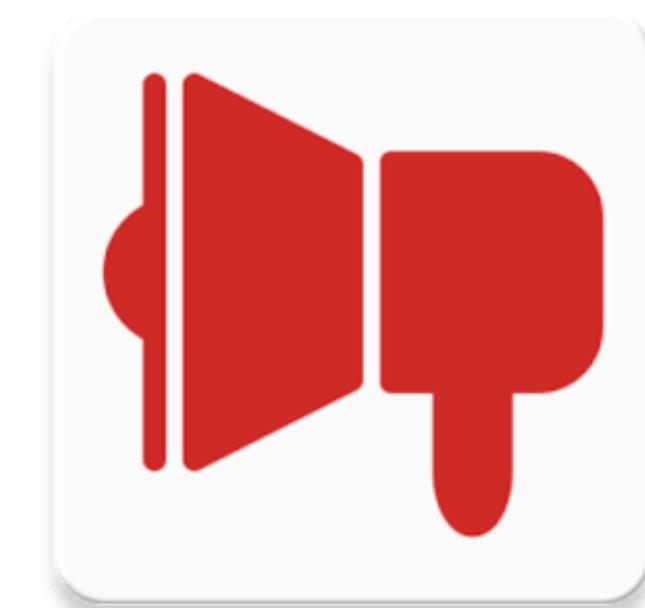
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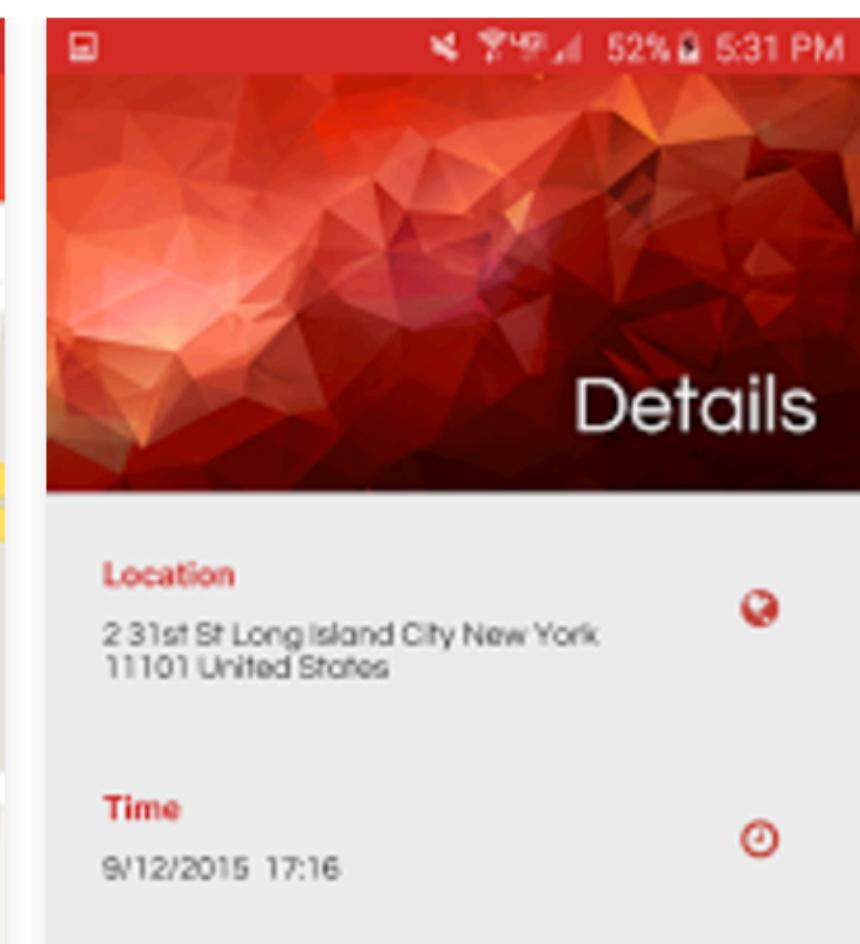
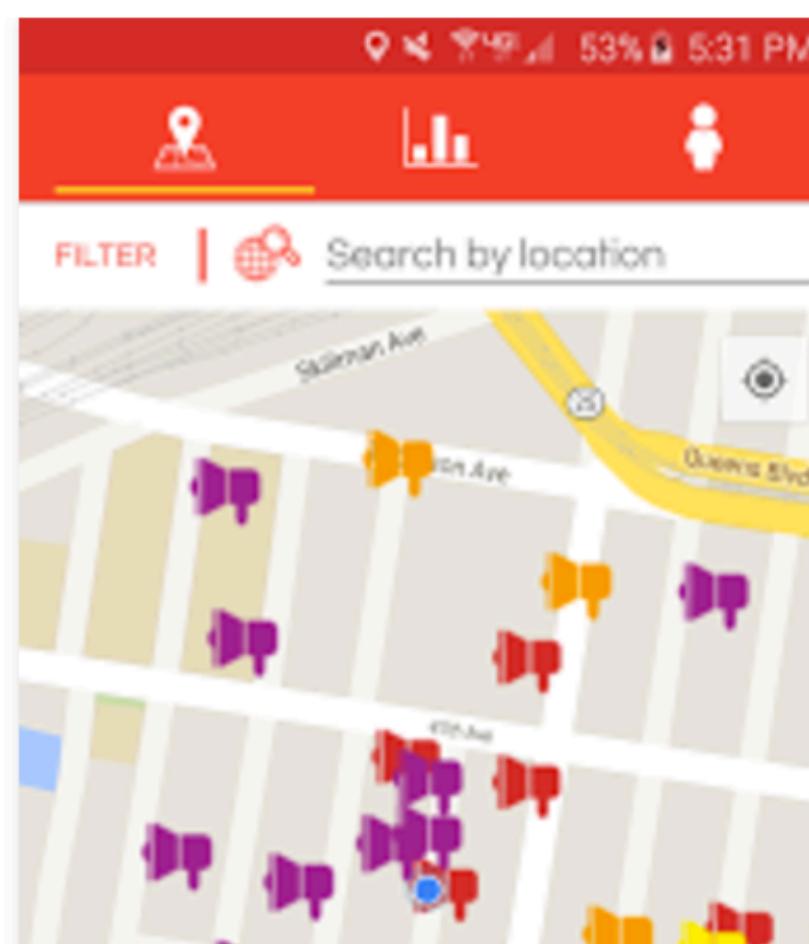
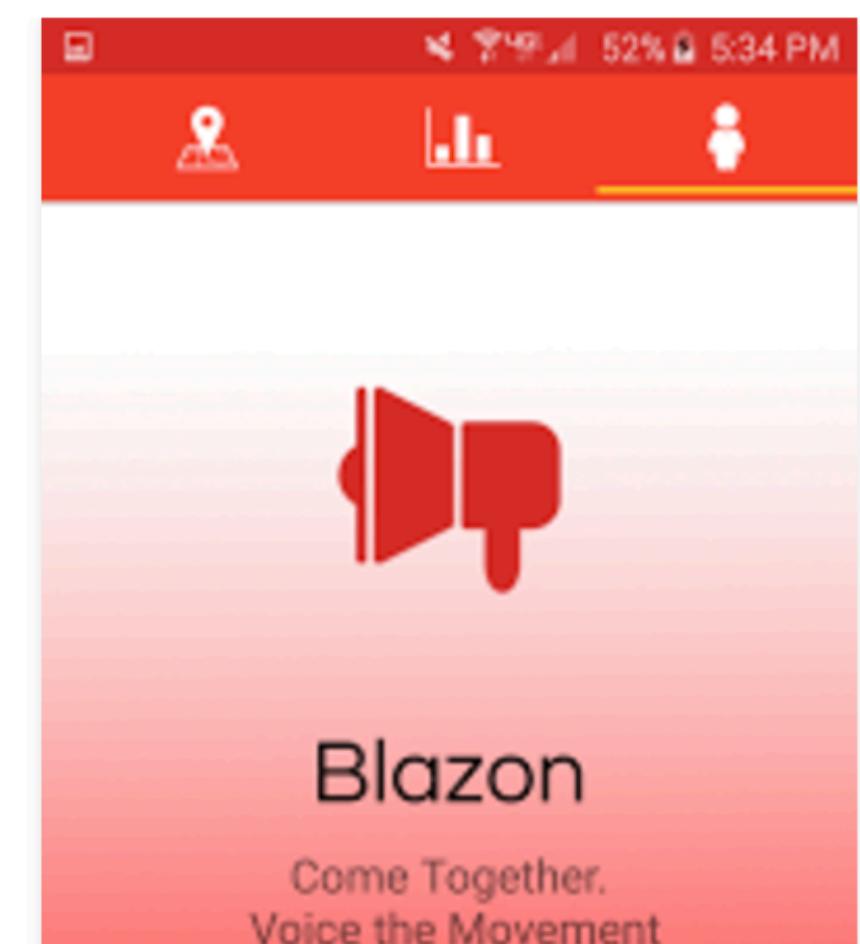
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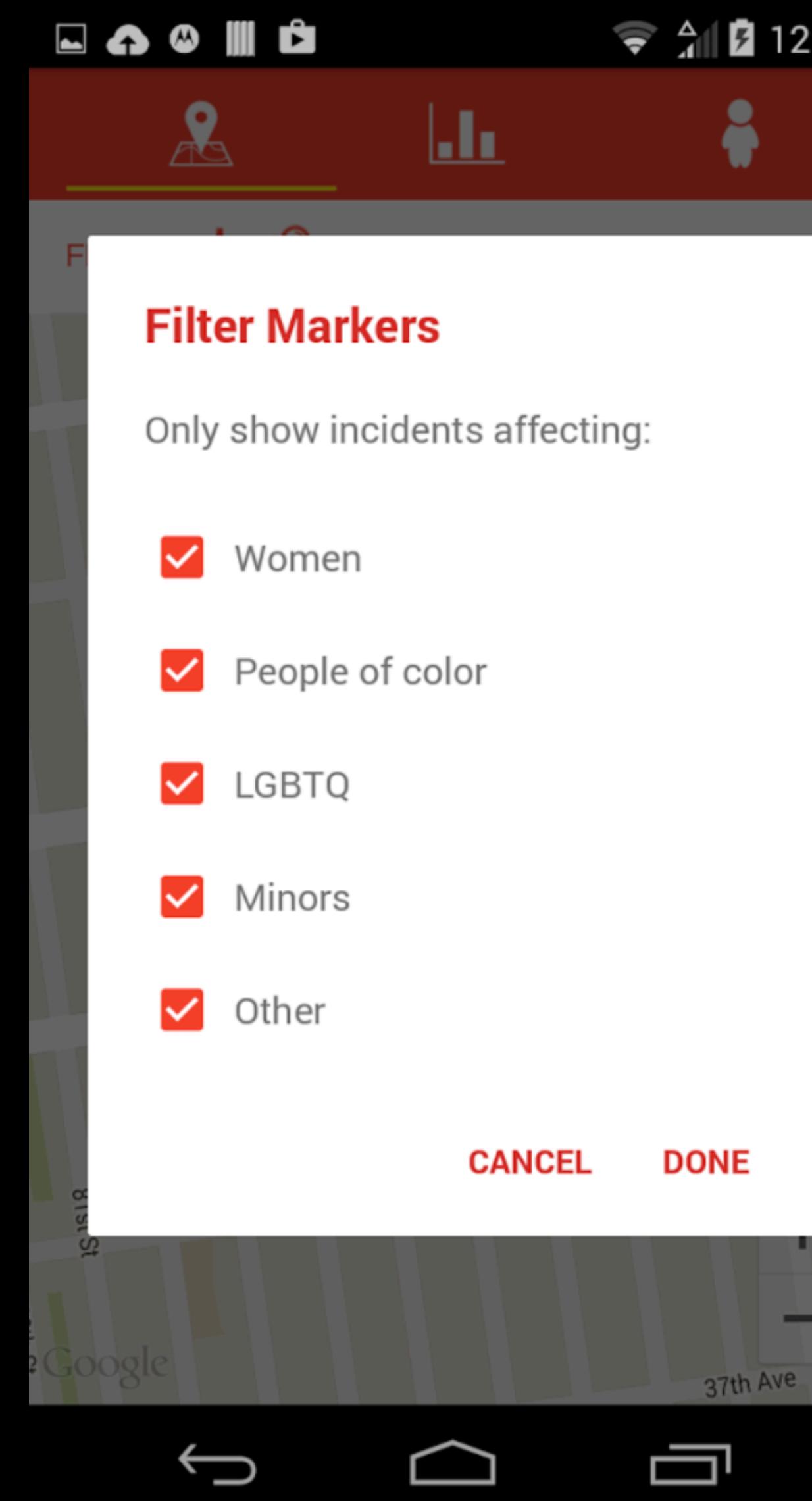
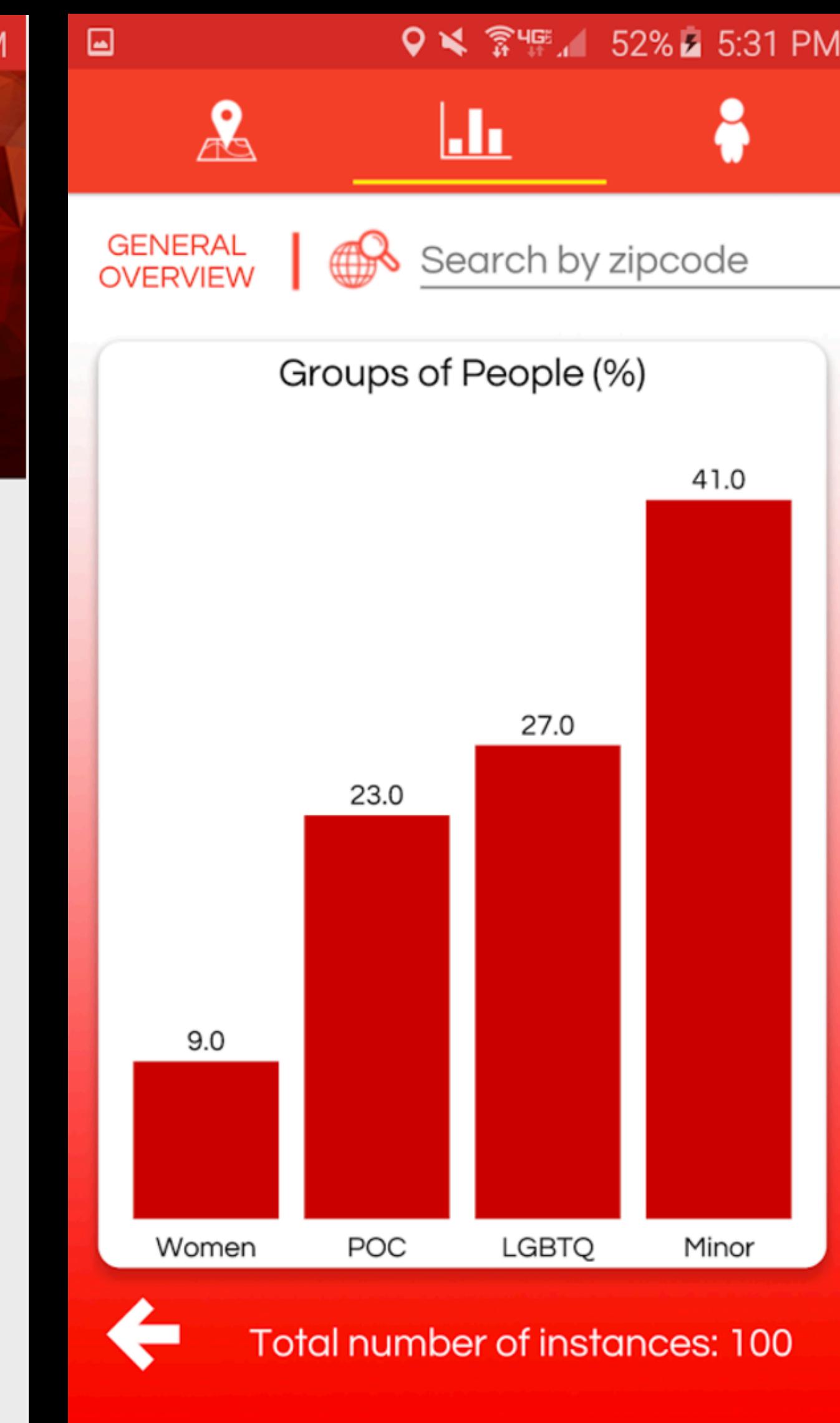
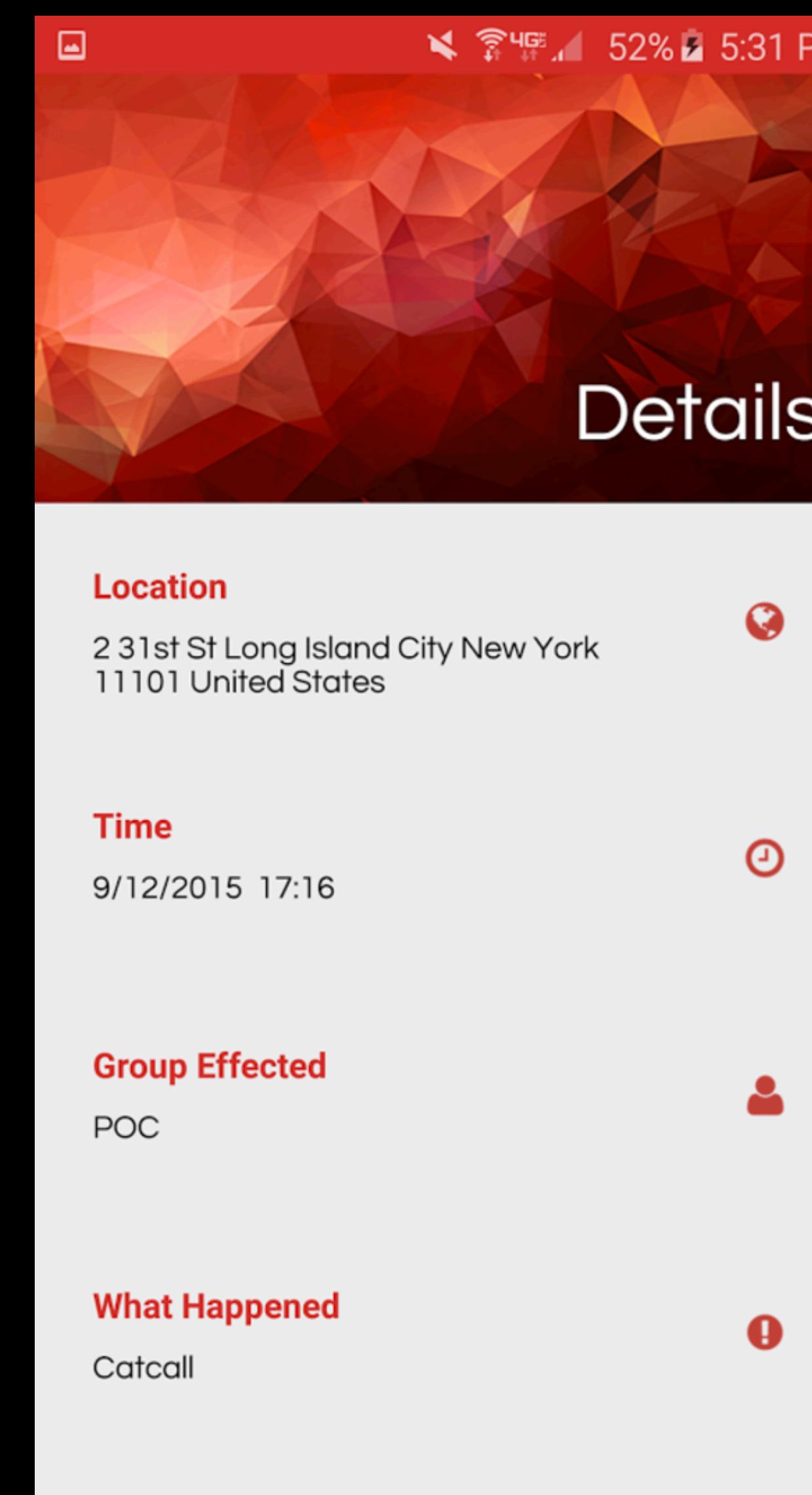
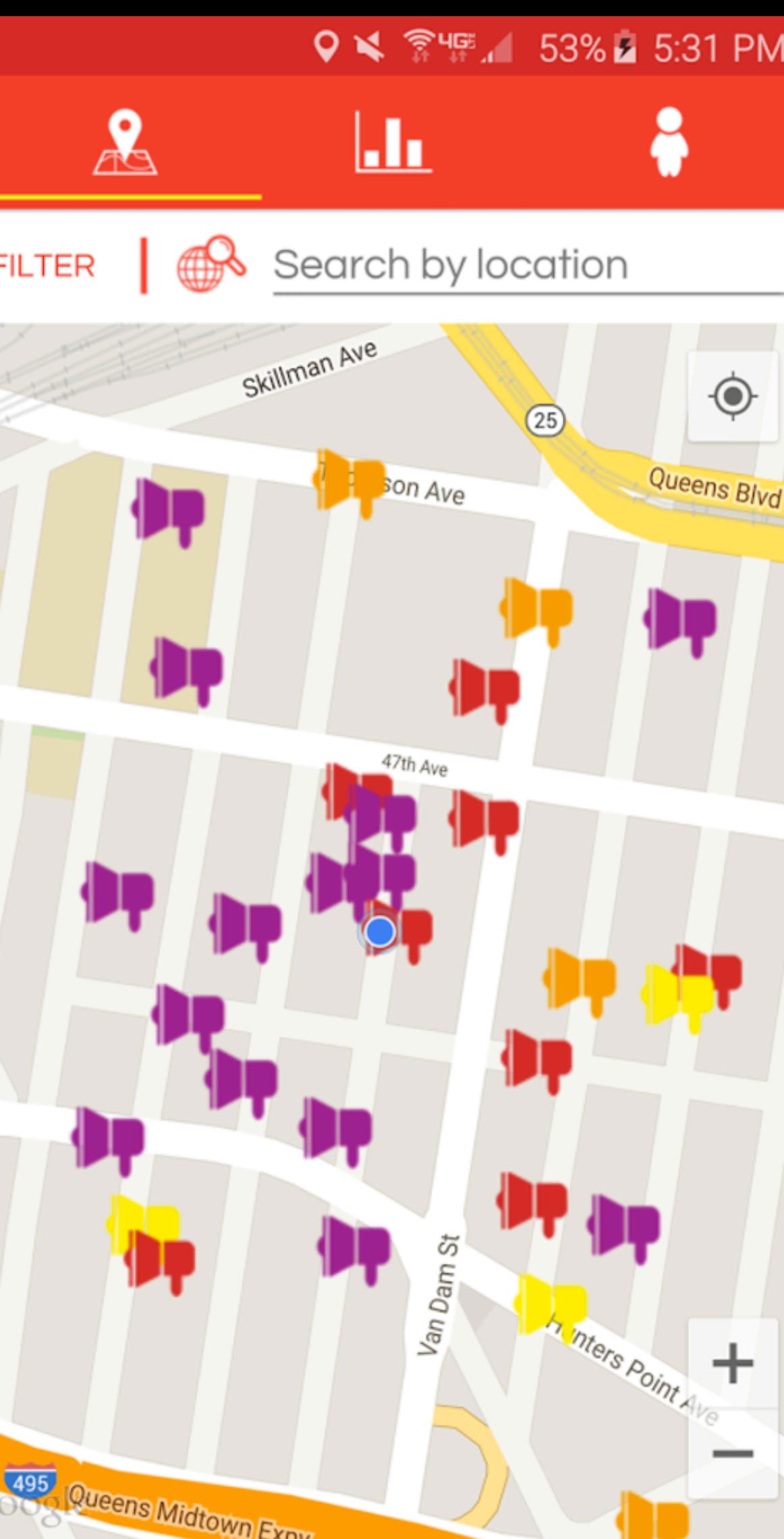
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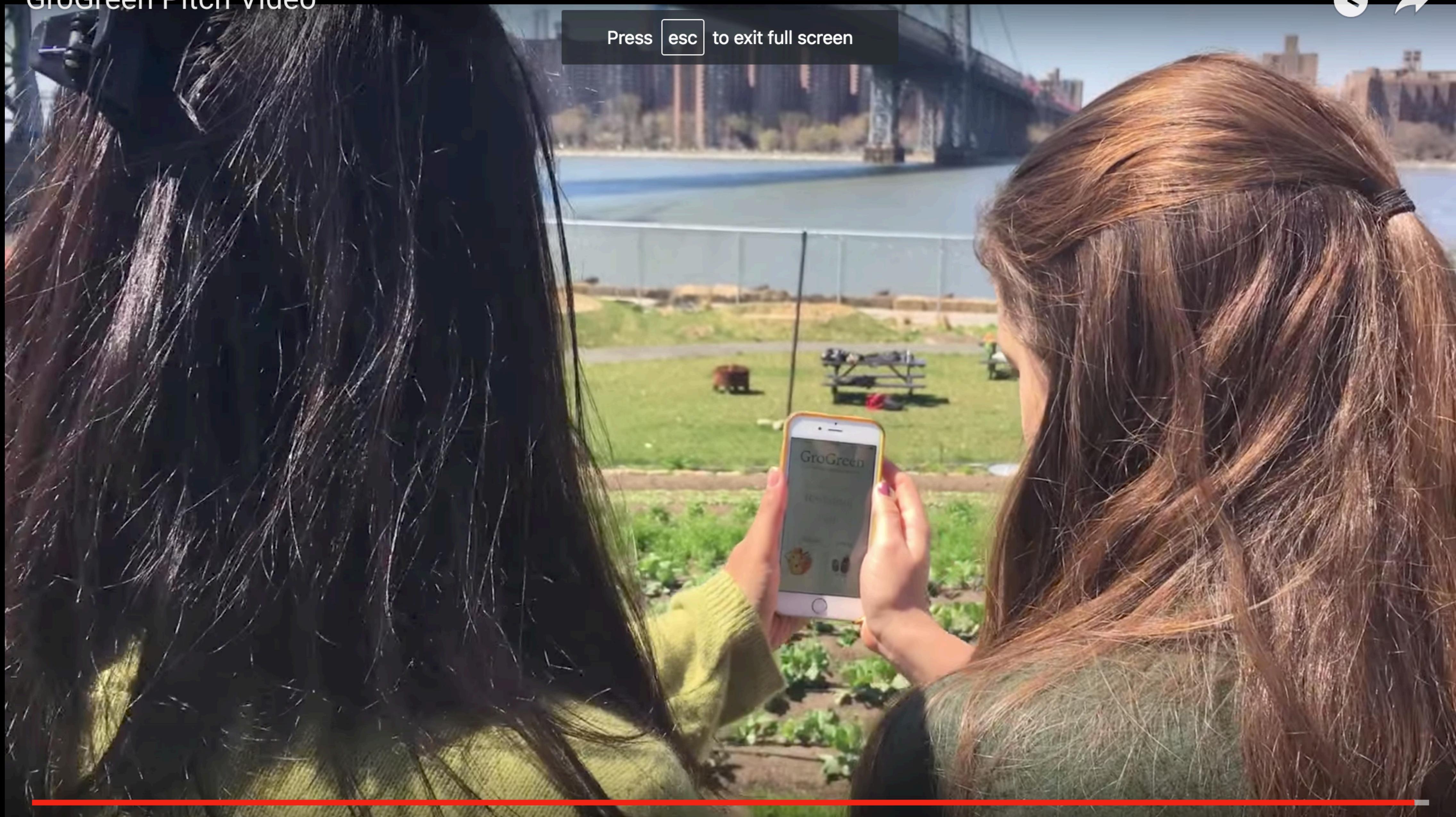


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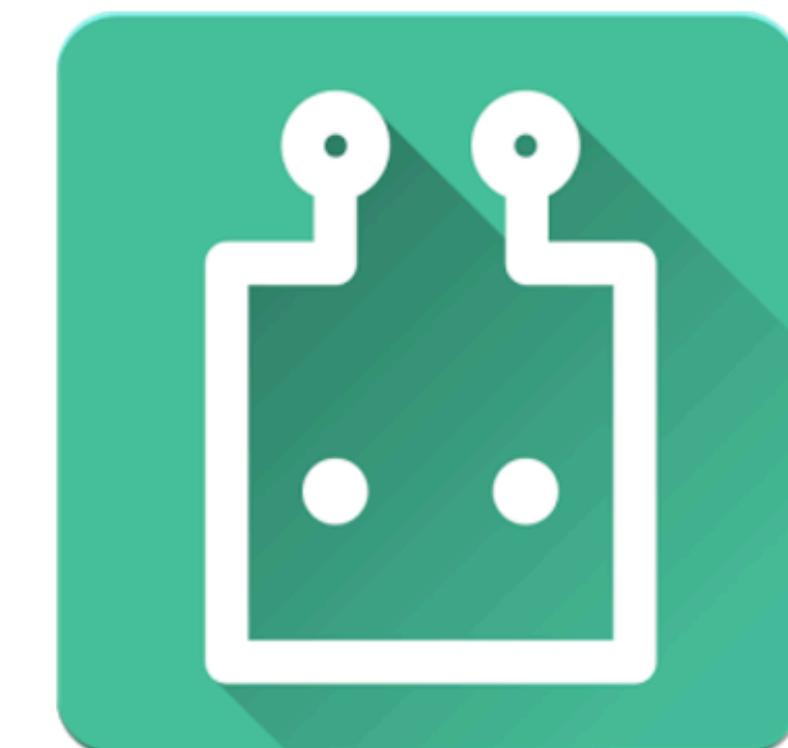
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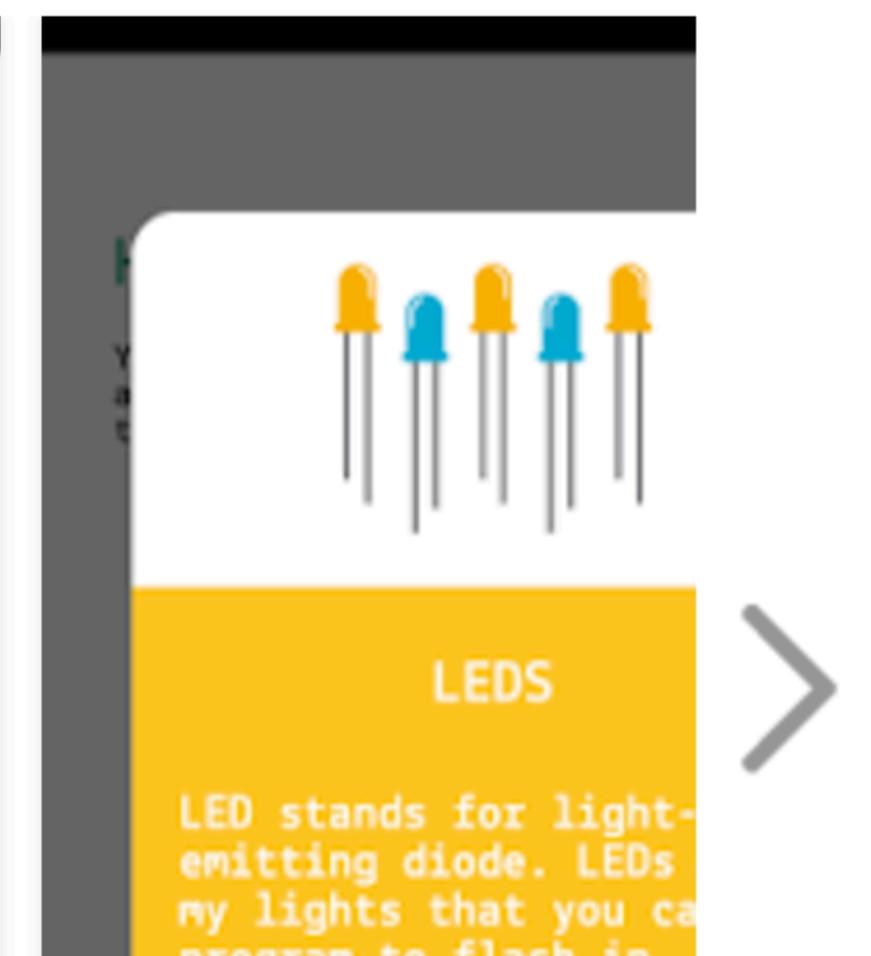
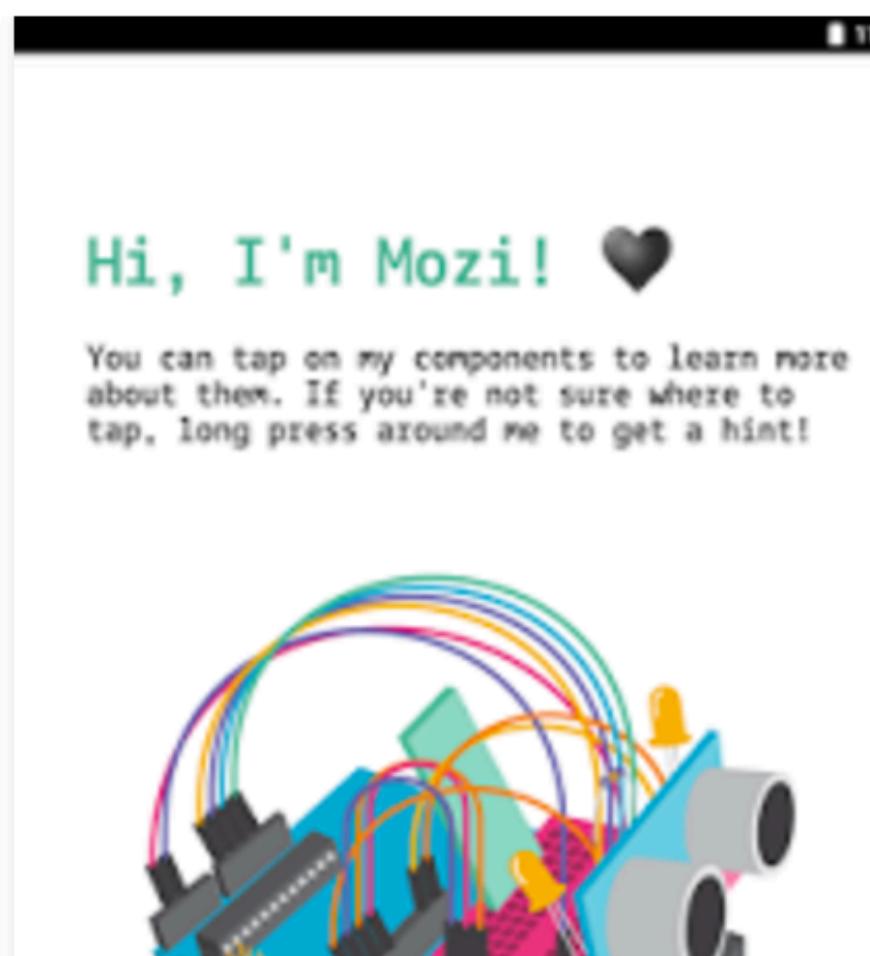
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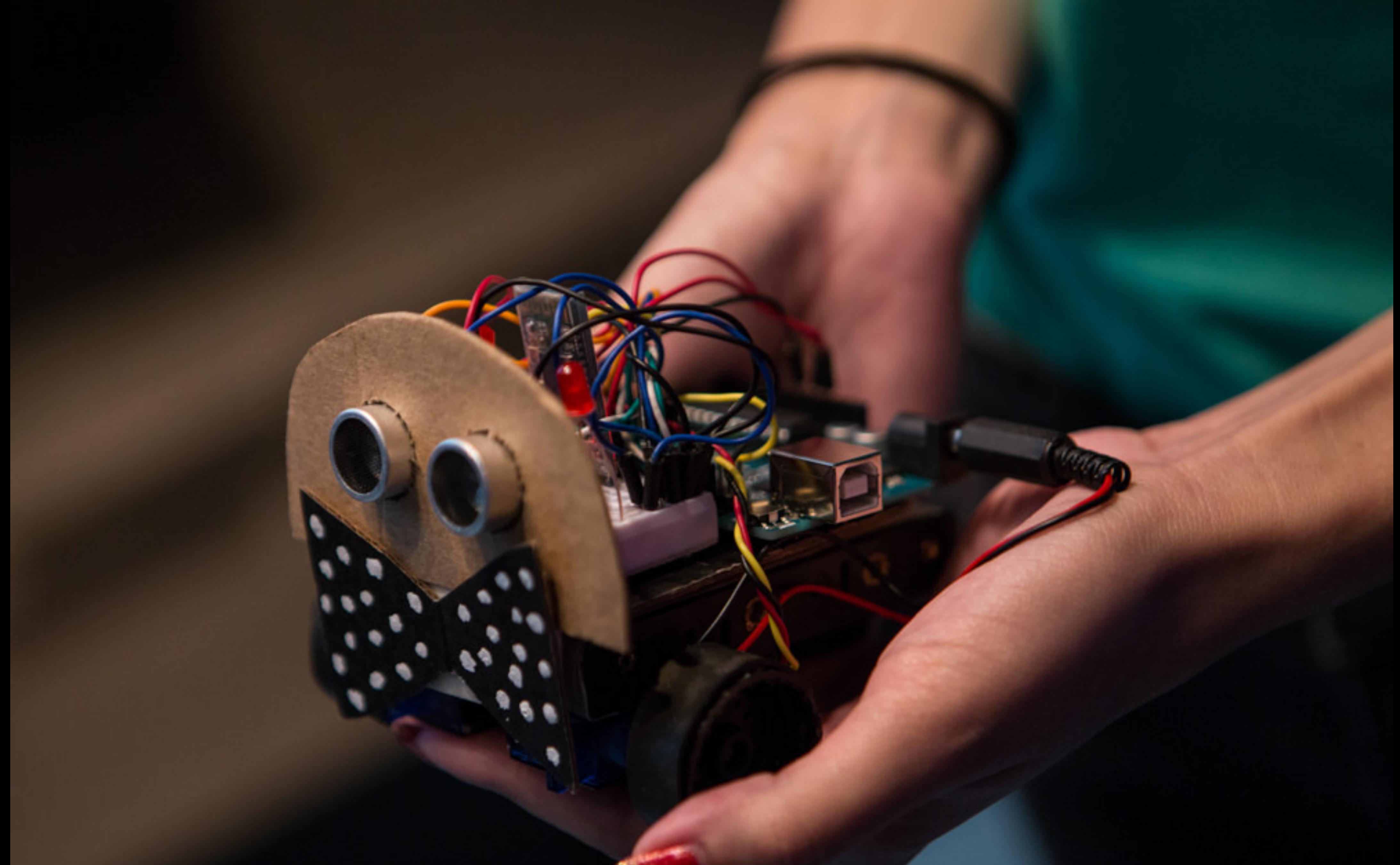
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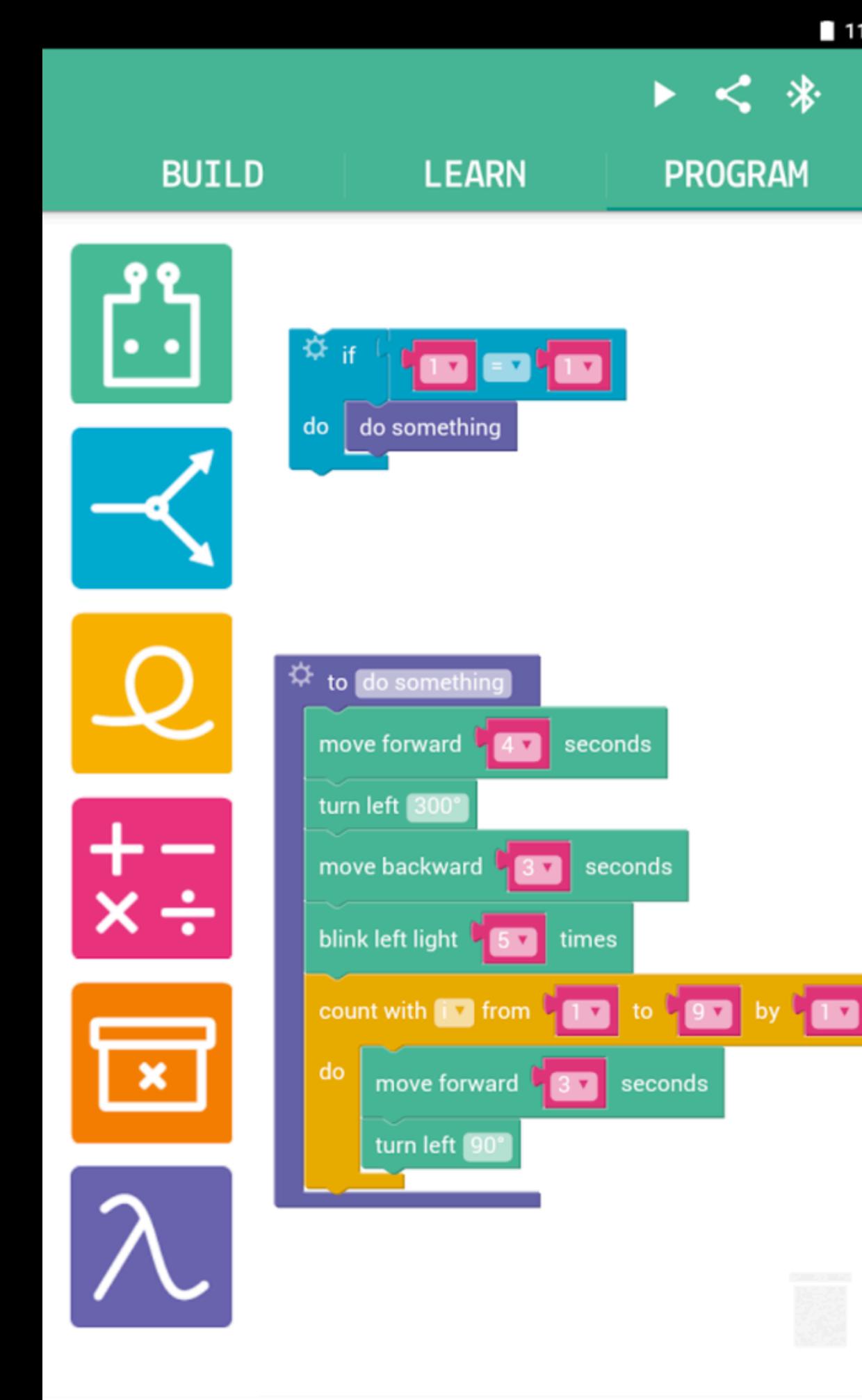
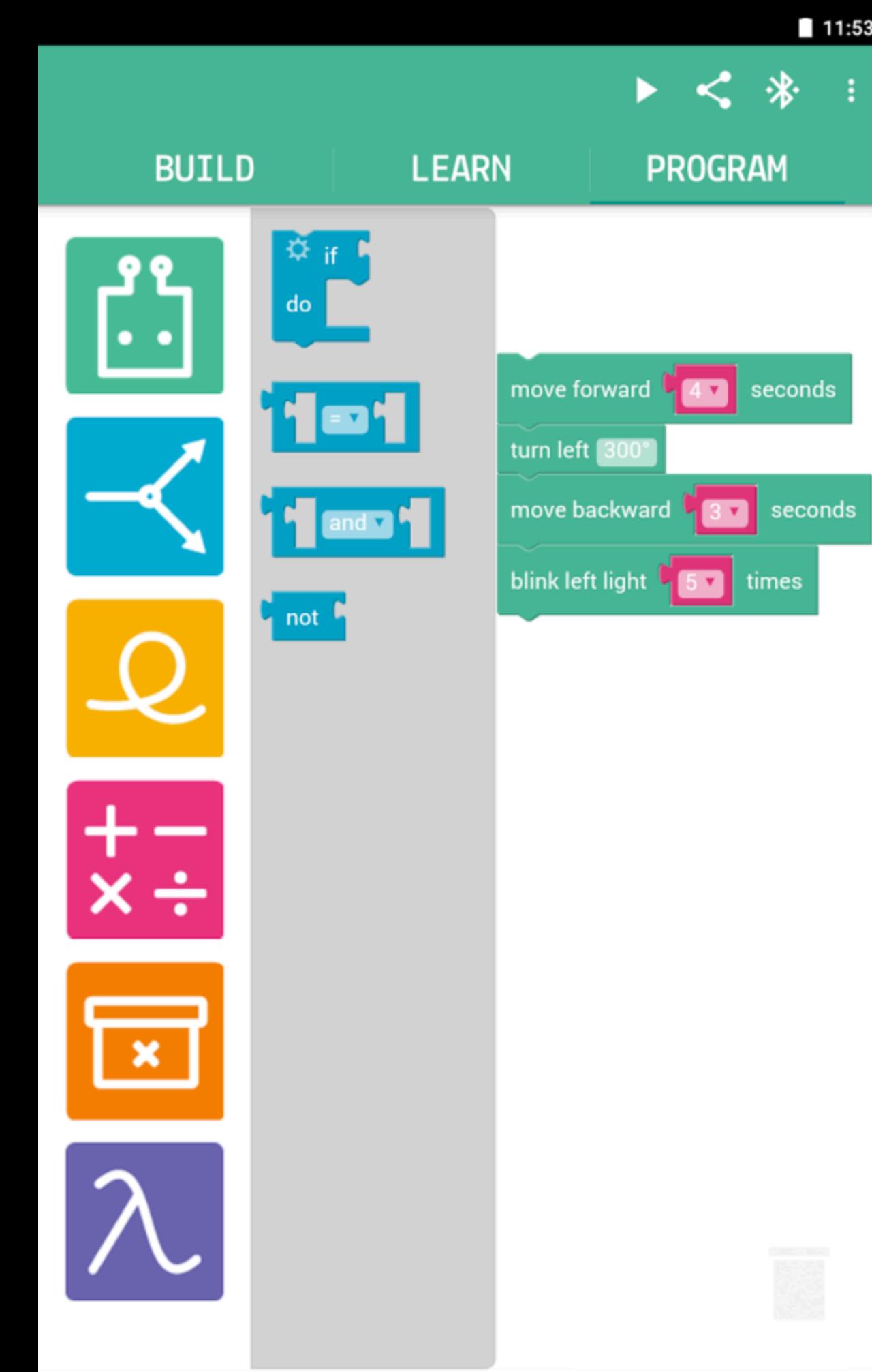
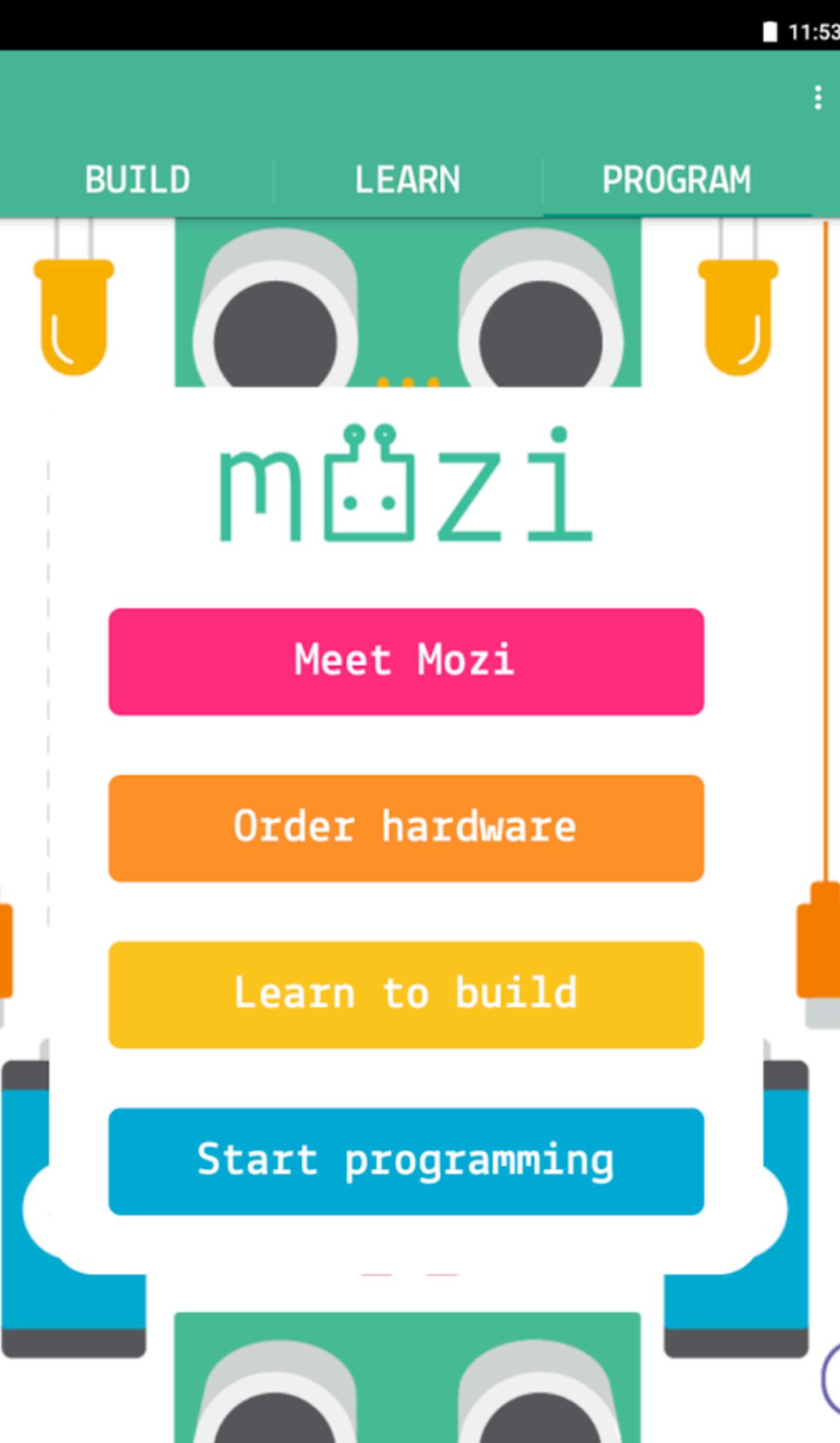
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bettering their skills & themselves

+

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those who experience problems  
are best equipped to solve them

can this be replicated & scaled?



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Teaching former inmates to code to create social change | Founder [@alexqin](#)

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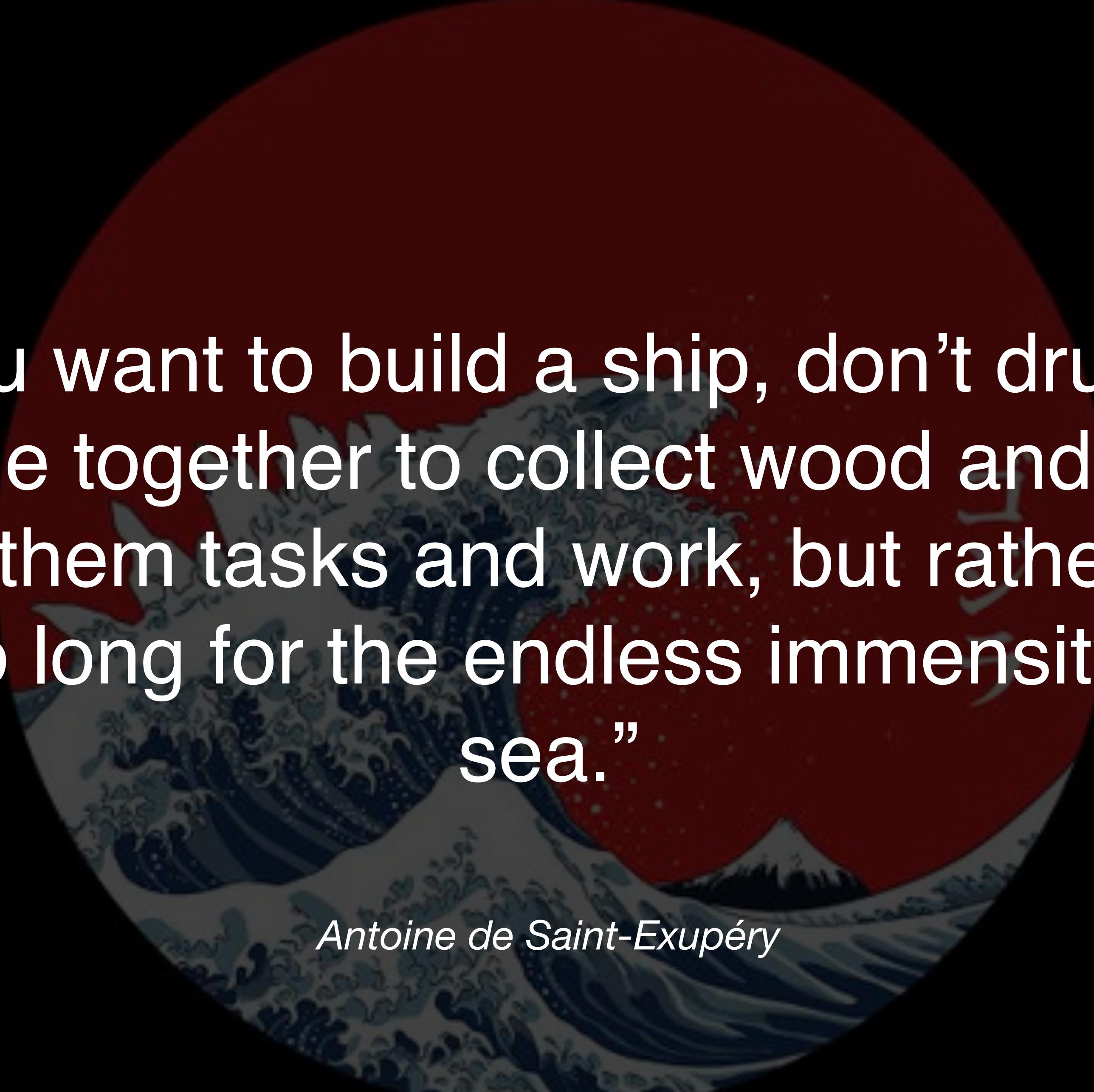
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“If you want to build a ship, don’t drum up people together to collect wood and don’t assign them tasks and work, but rather teach them to long for the endless immensity of the sea.”

*Antoine de Saint-Exupéry*

# GAKKO Technology

*coming soon*



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