



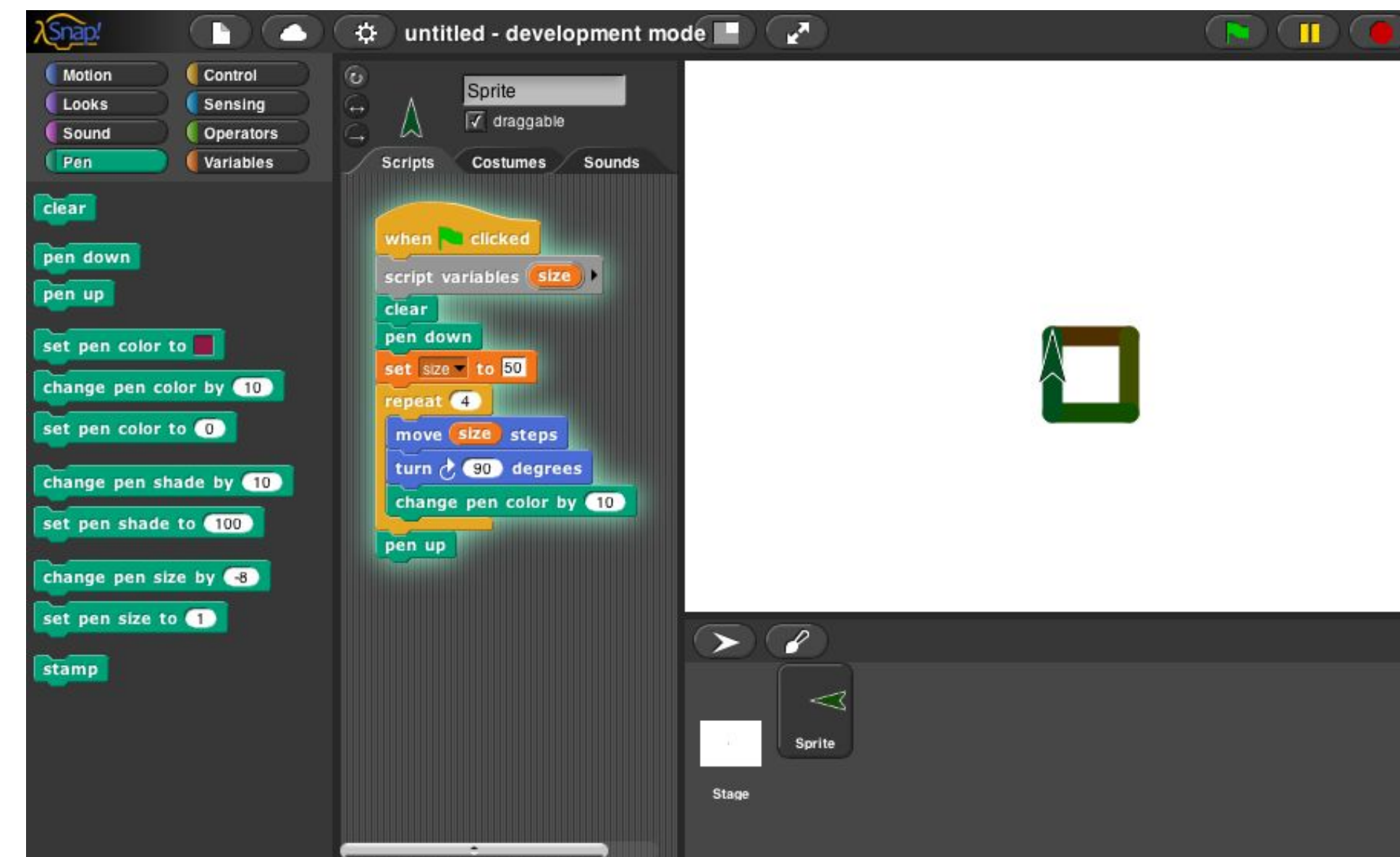
Snap! Cloud: A Look at 5 Years and 2.5 Million Projects

Michael Ball, Jens Mönig, Bernat Romagosa, Brian Harvey, Lauren Mock

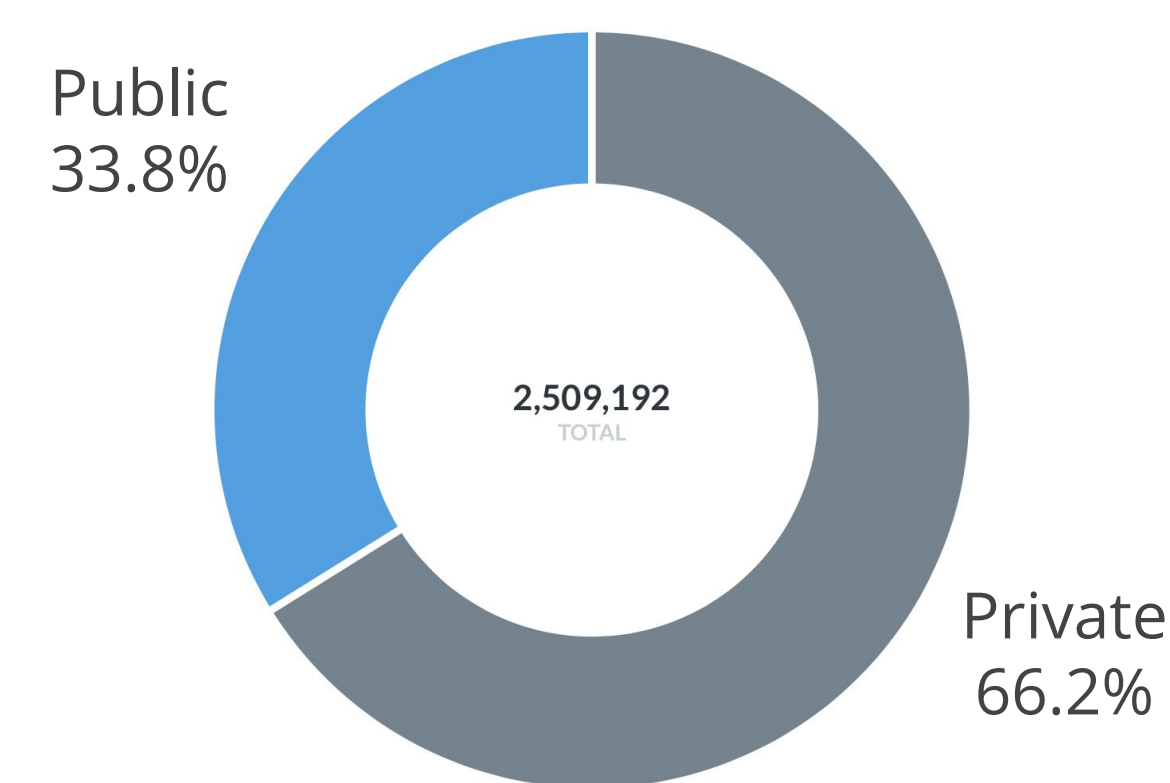


Snap! Cloud Background

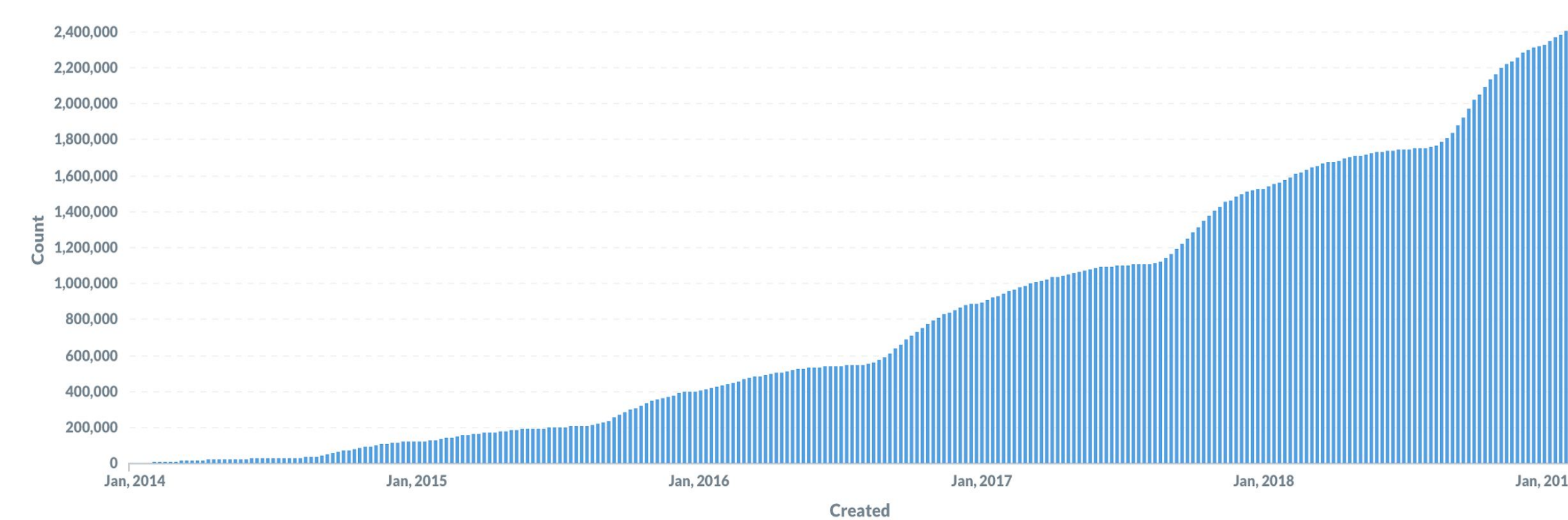
- Snap! is an IDE, like Scratch, but supports custom functions, recursion, lambda, etc.
- Beta in March 2013, wider release early 2014.
- Snap! Cloud provides a place to store and share projects.
- As of today, social site features are in beta.
- Just under 260K total users.
- 1/3 projects are shared via URLs.
- **100K projects updated in the past 30 days!**



Count of Published Projects



Cumulative Users Each Week

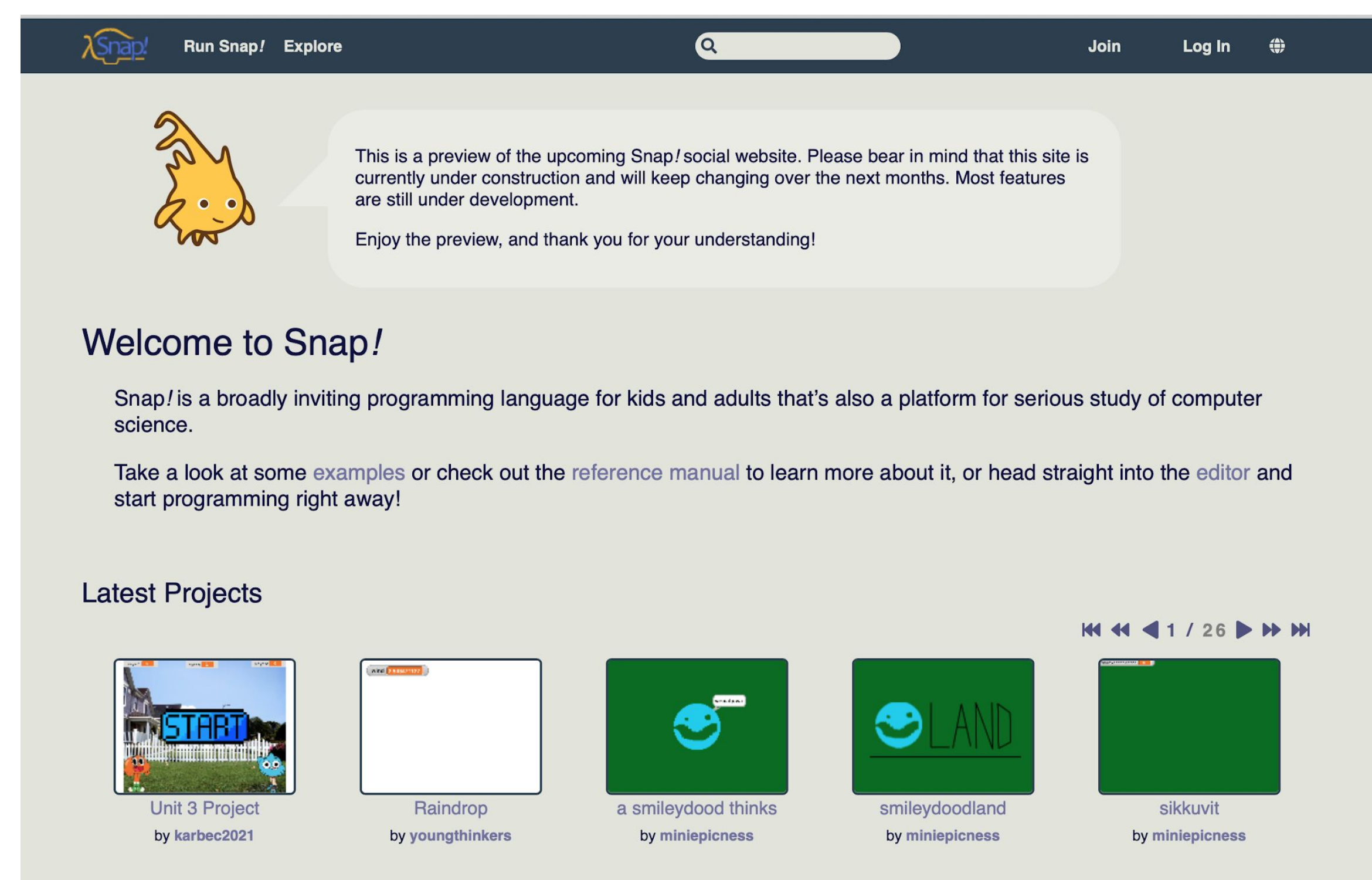


Architecture

- Feb 2018, deployed a rebuilt cloud backend due to funding changes → more control!
- OpenResty (nginx + Lua) as a web server, Lapis as the back-end framework, custom JS on the front-end.
- Backed by a Postgres instance and a remote disk store for project storage.
- ~800GB of project data stored to date.

Dataset & Methods

- July 2018, extracted public projects
- 557,198 total projects
- Removed all media (sounds and graphics) from project data.
- Snap! project files are a XML representation of blocks.
- Loaded ~45GB into a (separate) Postgres database, using XML data type.
- Analysis done via XPath + SQL queries.



Results

Top 15 Blocks Used by Students

set to 0	1.40M
go to x: 0 y: 0	1.22M
if	1.18M
if = if	1.18M
when I receive	1.10M
say Hello! for 2 secs	1.07M
when clicked	0.98M
move 10 steps	0.95M
wait 1 secs	0.91M
when space key pressed	0.84M
switch to costume	0.79M
hide	0.65M
point in direction 90	0.59M
answer	0.57M
forever	0.56M

Total Primitives Used: 27.80M

Types of Custom Blocks Made

915.97K

Command

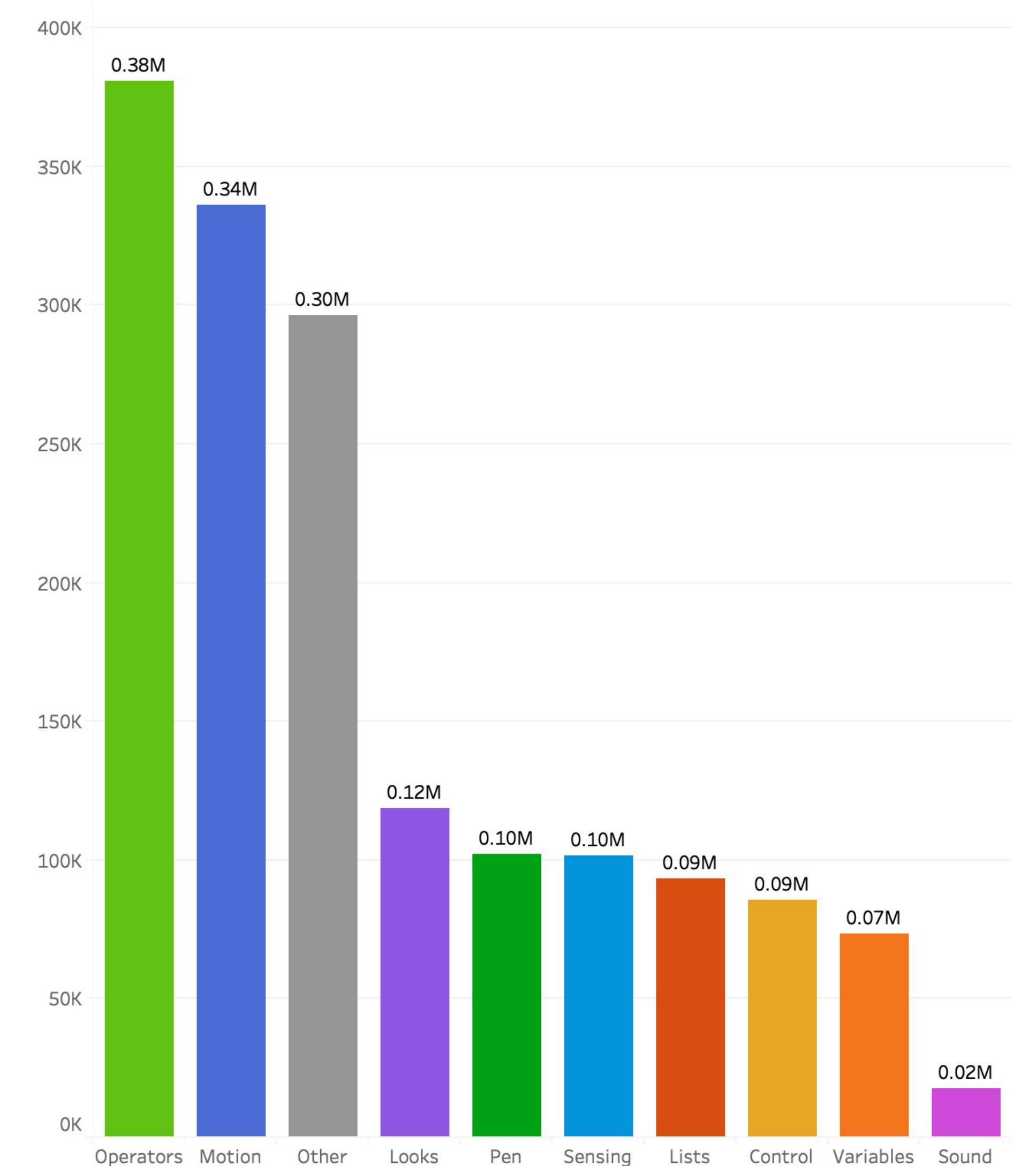
554.54K

Reporter

135.09K

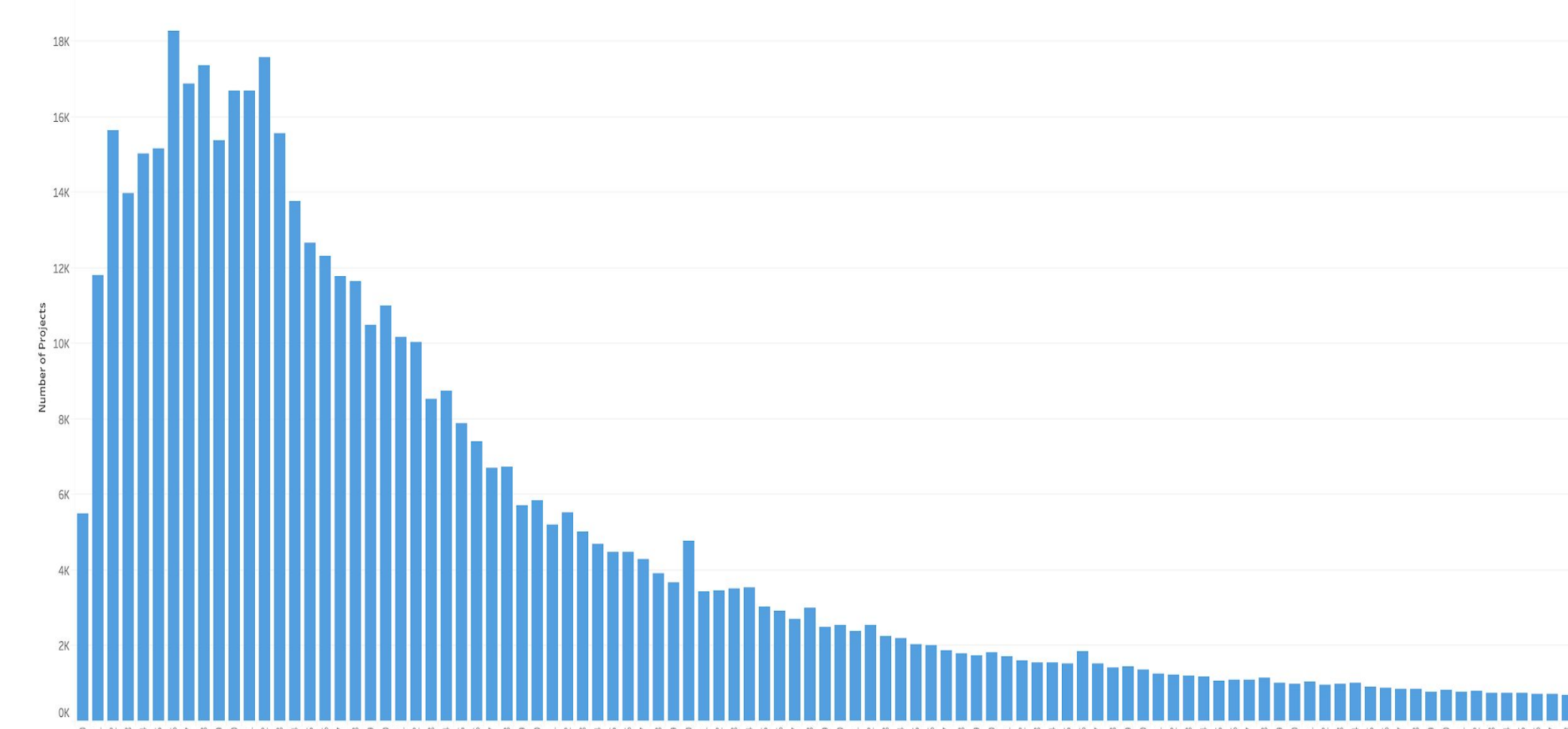
Predicate

Custom Blocks Built by Category



- 1.60M custom blocks built (excluding library blocks).
- 53K blocks use recursion, 3.3% of projects.
- 17% of projects contain at least 1 code comment.
- 59% of projects use 1 or more custom blocks, including importing libraries.
- 51% of projects use 1 or more non-library custom blocks.

Projects by Number of Blocks Used



Projects by Number of Custom Blocks Used

