Comparing App Inventor 2 and App Inventor Classic Based On User Data

Cali Stenson

Wellesley College

Project Goal

This research involves the analysis of mobile app programs created with MIT App Inventor [1]. We compare the user project data from App Inventor 2 (AI2) with App Inventor Classic (AI1). Data analysis of App Inventor Classic comes from Johanna Okerlund's work [2]. Our hypothesis was that a higher percentage of users would be able to create projects with blocks in AI2 compared to AI1. This hypothesis is based on work done to make AI2 easier to use than AI1. We analyzed 24,698 projects from 3,412 AI2 users.

MIT App Inventor Background

MIT App Inventor is a programming environment for creating apps for Android devices in a web browser. App Inventor programs are built by connecting blocks that fit together like puzzle pieces (Figure 1), making it easy for novices to create mobile apps. In order to make an app, a user creates a project composed of two parts: a specification of the app's user interface, and blocks that control the behavior of the app. App Inventor's live development feature allows users to test their apps on their Android devices as they build their apps.

Editing blocks in AI2 is much easier than in AI1. First, the AI2 blocks editor runs in a web browser, whereas AI1 runs as a java application requiring additional installation. Additionally, the blocks for AI2 (Figure 1) were designed to avoid numerous problems experienced in AI1 (Figure 2). As of October 5, 2014 AI1 has 1,549,631 users and 3,755,806 projects [3], and AI2 has 838,352 users and 2,153,740 projects [4].
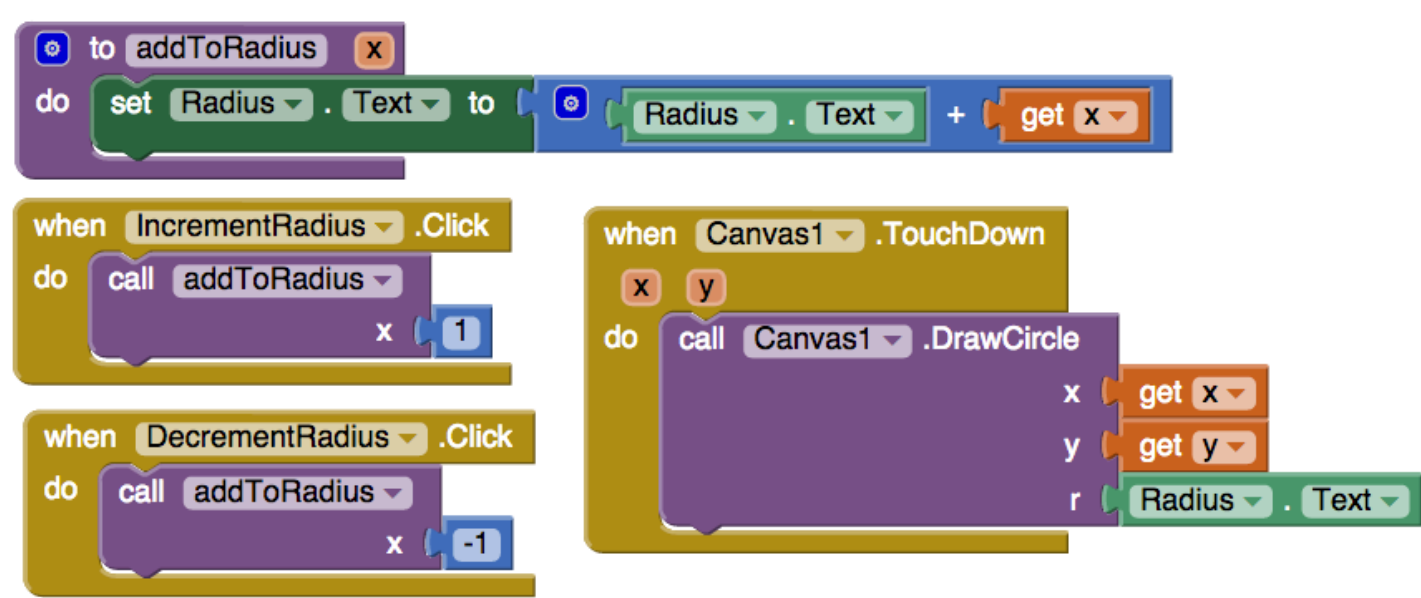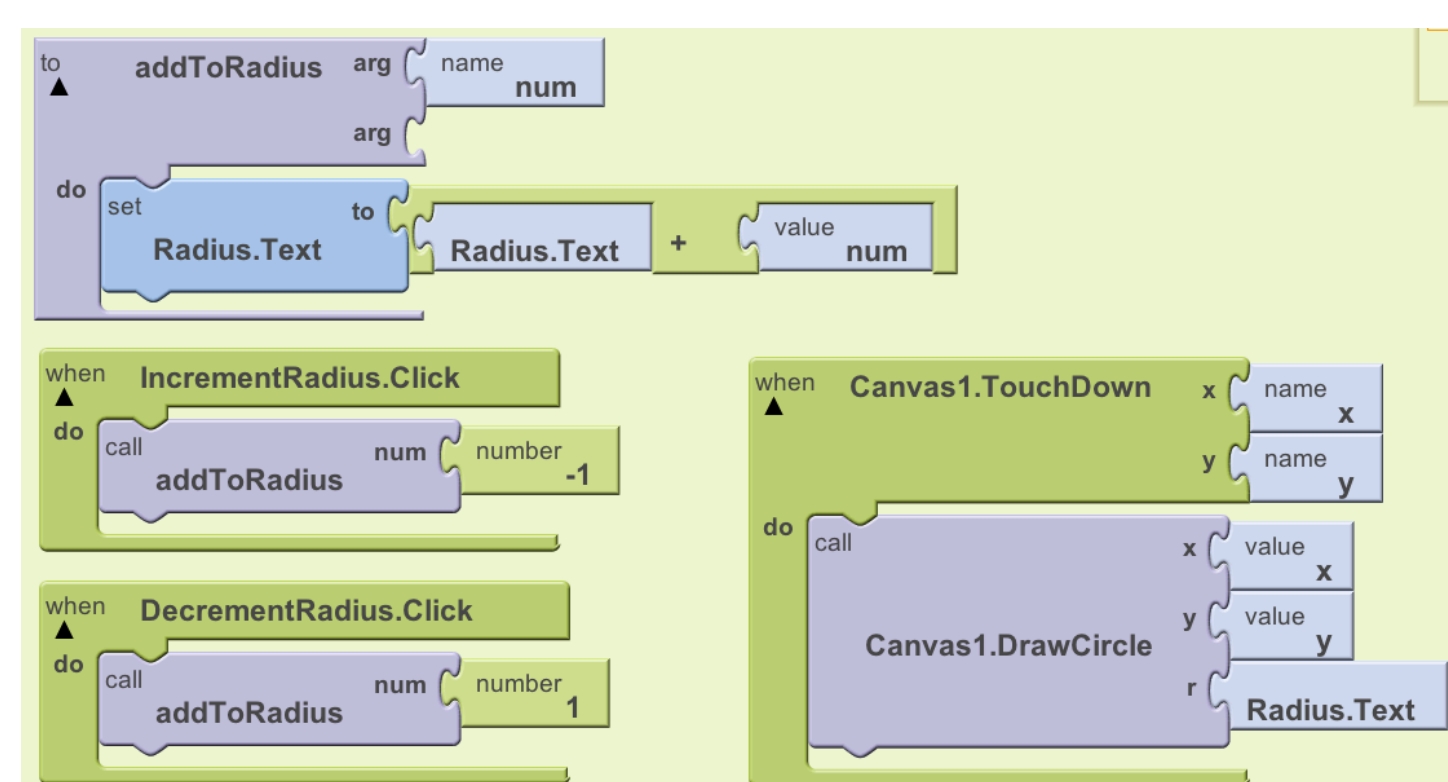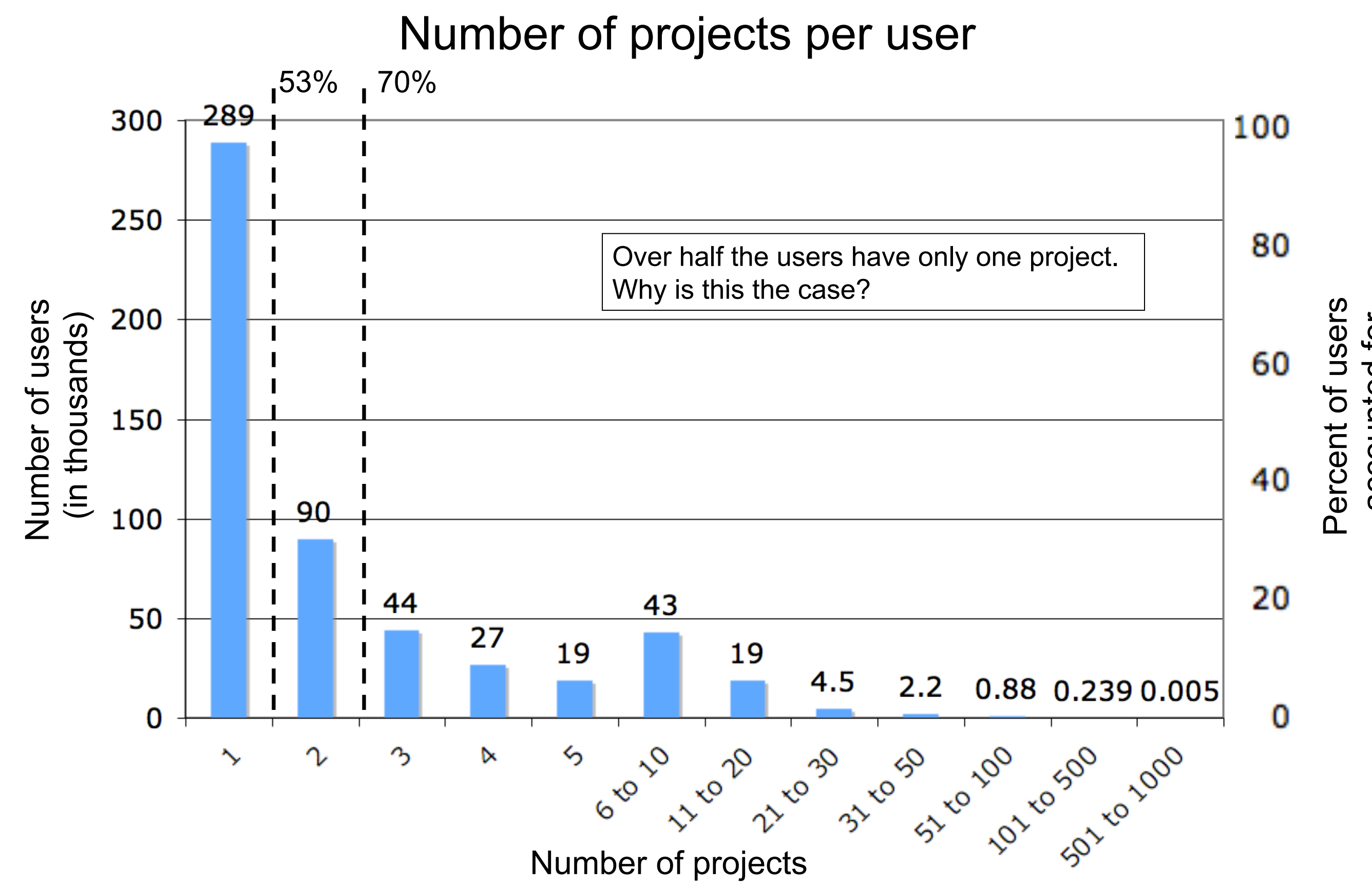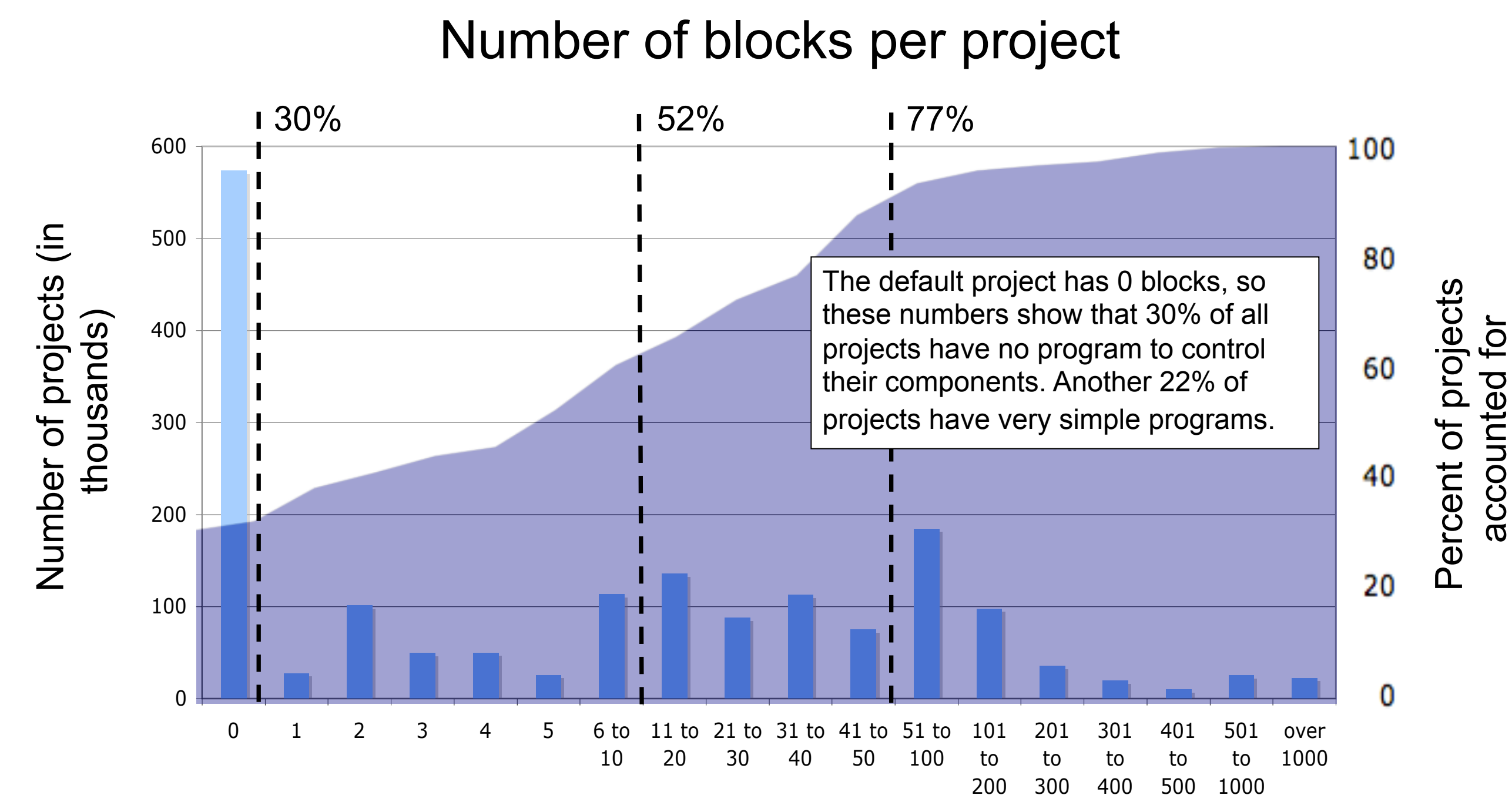
Figure 1: Example Blocks in AI2

Figure 2: Example Blocks in AI1

APP INVENTOR CLASSIC (GRAPHS BY JOHANNA OKERLUND)

Number of blocks per project

The default project has 0 blocks, so these numbers show that 30% of all projects have no program to control their components. Another 22% of projects have very simple programs.

Number of projects per user

Over half the users have only one project. Why is this the case?

References

[1] MIT App Inventor Home Page. http://appinventor.mit.edu/

[2] J. Okerlund, F. Turbak, A Preliminary Analysis of App Inventor Blocks Program, http://cs.wellesley.edu/ ~tinkerblocks/ VLHCC13- poster.pdf, accessed October, 2014.

[3] MIT App Inventor Beta, App Inventor Stats, http://manhole.mit-appinventor-experimental.appspot.com/, accessed Mar 14.

[4] MIT App Inventor, App Inventor 2 Stats, http://appinventor.mit.edu/ ai2stats/, accessed Mar 14, 2014.

APP INVENTOR 2 (GRAPHS BY CALI STENSON)

Number of blocks per project

Number of Projects per User
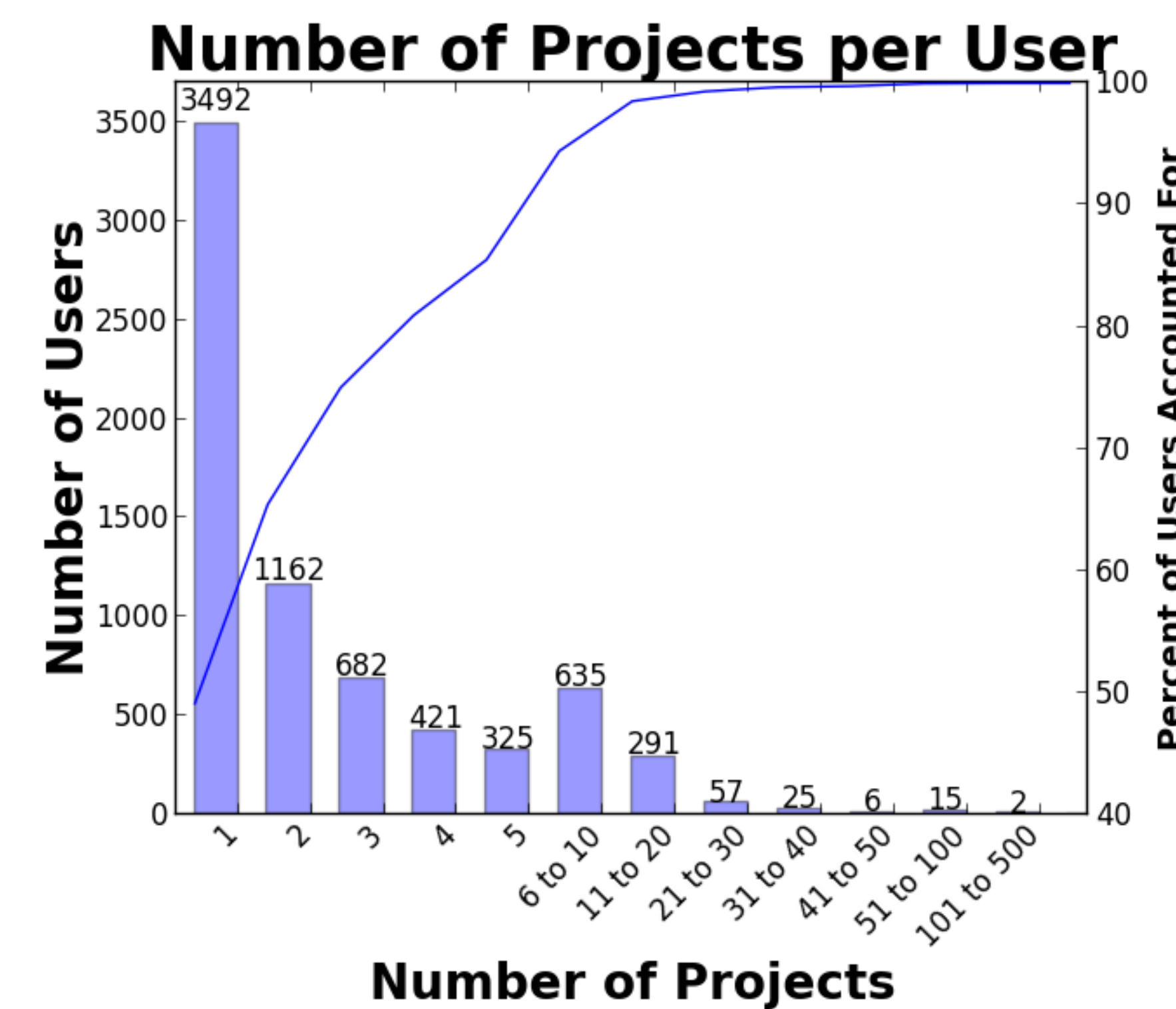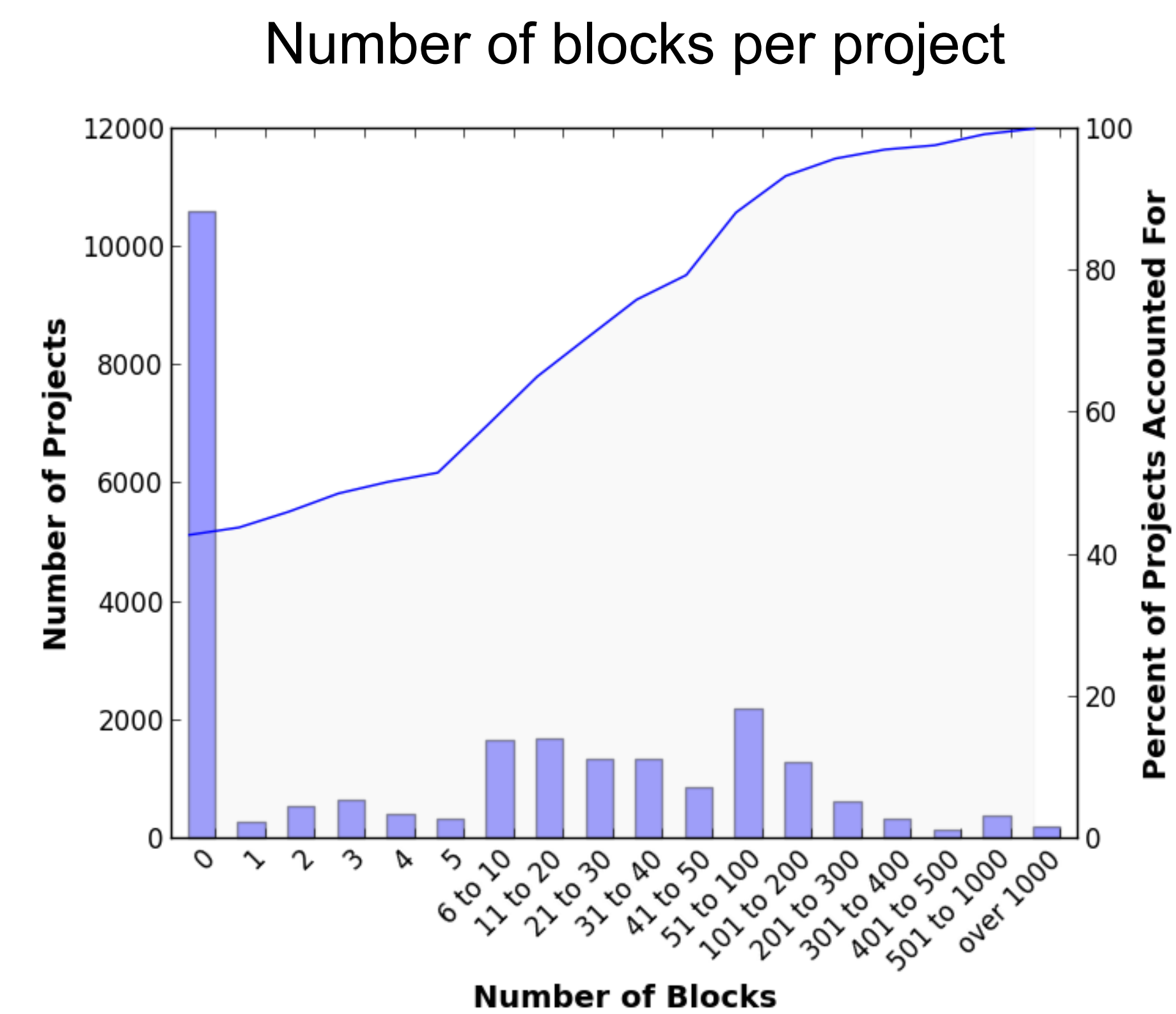
Future Work

Before any proper comparison can be done between AI1 and AI2 project data, the process through which AI2 projects are backed up must be changed. We are investigating an AI2 backup process in which (1) every project is backed up and (2) the backup can be no more than 24 hours older than the current project. This change addresses the two main problems we encountered in our current research. Once the backups are changed in this way, we can do a proper comparison between AI1 and AI2. Future comparisons will include those graphed here as well as frequency of block type use, number of calls per procedure in projects, and analysis of components on projects.

Previous Work

Johanna Okerlund, Wellesley College class of 2014, collected data on blocks usage from AI1 projects. She analyzed 1,711,167 projects from 541,671 users. Okerlund found that 30% of the programs created in AI1 had no blocks in them. In addition to so many projects having zero blocks, 22% of them had between one and ten blocks. Moreover, most users only make one project. This data suggests that users either were having difficulties using the blocks editor or that users were only making simple apps (possibly following introductory tutorials).

Differences in AI1 and AI2 Project Data

- The AI1 and AI2 data for these analyses come from project backups in the cloud.
- The number of AI1 projects analyzed (1,711,167) is significantly larger than the number of AI2 projects analyzed (24,698).
- All AI1 data is backed up completely in the cloud every 1-2 weeks. AI2 project data is only backed up when a project is edited more than 24 hours since the previous backup. The version backed up is the version that exists when the editing session starts, so the backup is stale. An AI2 project that is not edited after the day of its creation will never be backed up, so the backups are incomplete.
- Of the 24,698 AI2 projects analyzed only 24,402 had blocks files backed up. (Only the file affected by the edits gets backed up so many projects are incomplete).

Conclusion

The results of the AI2 data analysis appear to show that the percentage of empty blocks files is higher for AI2 than AI1. This surprising result contradicts our hypothesis. However, since the data for AI2 is backed up in a different way than for AI1, the project data backed up for AI2 is insufficient to properly compare it to data from AI1 for two key reasons:

- Empty block files in AI2 represent the penultimate version of projects that have been edited, which means that it is unlikely that the most recent versions of these projects actually contain zero blocks.
- Any empty projects are likely missing from the current AI2 data since unedited projects are not backed up.

Acknowledgements