

BYOB – Bringing “No Ceiling” to Scratch

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Introductory description and overall goals

Scratch (scratch.mit.edu) is a graphical drag-and-drop programming language for kids from MIT. The same non-intimidating interface and ease of use that make it work for eight-year-olds also make it appealing as a language for courses to introduce computer science ideas to non-CS majors at the university level. But Scratch has weaknesses as a programming language, most notably the inability to define procedures, and therefore to explore recursion. As a result, several schools use Scratch for the first week or two and then switch to a “serious” programming language for the rest of the course.

Instead of that, we propose adding just a few capabilities to Scratch, so that it remains un-intimidating for kids, but can also serve older learners. BYOB (Build Your Own Blocks) is an extended version of Scratch adding procedure definition, first class procedures, and first class lists. With these we can invent *in BYOB* additional tools for whatever data structures and control structures are needed. This workshop will introduce participants to BYOB (byob.berkeley.edu).

Method

After a brief introduction to Scratch, participants will explore writing procedures, recursion, creating control structures, using and writing higher order functions, and building data structures. There will be specific exercises to introduce each of these topics, but most of the time will be spent in free exploration of BYOB.

Expected outcomes

Participants will understand how some important computer science ideas can be expressed in the medium of a graphical programming language, especially recursion and higher order functions. They will be able to write BYOB programs.

Keywords (style: Keywords)

programming language; Scratch; BYOB; recursion; higher order functions