Improving the Usability of App Inventor through Conversion Between Blocks and Text
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Problem

MIT App Inventor 2 (AI2), a popular online environment for Android app development, democratizes programming through its easy-to-use blocks language. While simple blocks programs are easy to read and write, complex ones become overwhelming. Creating and navigating nontrivial blocks programs is tedious, and AI2’s current inability to copy blocks between projects inhibits sharing.

My Solution
TAIL (Textual App Inventor Language)

To address these issues, I have created a new textual language, TAIL, that is isomorphic to AI2’s blocks language and provided a means for converting between them. This project aims to (1) increase AI2’s usability by providing an efficient means for reading, constructing, and sharing programs, and (2) ease users’ transitions from blocks programming to text programming.

TAIL Language Design

Conversion Between Blocks and TAIL: The Details

Parser
ANTLR Parser Grammar Rules
expression_block | KLICKS; expression_Return
expression_Return | expression_Return + expression

ANTLR Lexer Grammar Rules
expression: '12' | '3' | '4'

ANTLR Lexer Actions in Javascript Target
to <average> | expression | result: ( (get x) + (get y) ) / (2) )

Tree Translation

Error Detection