

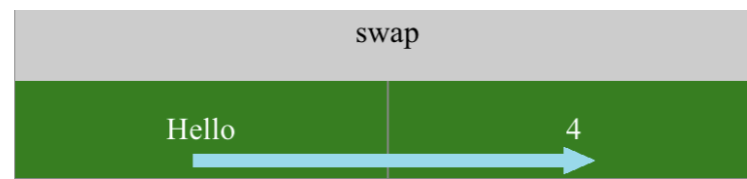
# Swipe-and-Tap Functional Programming

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Programming on touch-screen devices such as tablets is challenging. We present a novel user interface for editing programs in a compositional functional language with single-finger gesture input. Our system uses layout rather than syntax, requires no text input other than for actual textual values, and shows computation results at all times.

4	"Hello"
4	Hello
swap	
Hello	4
character-at	
o	

The program above reads top to bottom: the function "character-at" uses the values "Hello" and 4 to produce "o".



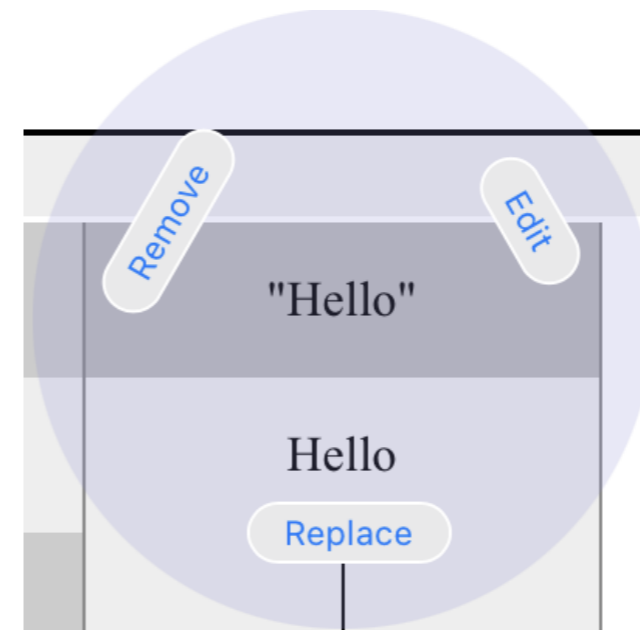
To edit the program, the user swipes across the *value(s)* they want to work with next, and a menu of functions able to process that data pops up.

character-at	
string	
(comment)	
string	int
swap	
int	string

Selecting one of the functions from the menu adds it to the program below the values, and immediately shows the result of the function below that. No text input is needed



To alter or remove a function already in the program, a tap will bring up an in-place radial menu with relevant options.



Selecting an option allows:

- Editing the value of a literal
- Replacing the function with another type-compatible one (accepts same inputs, produces same output type)
- Removing an unused function



Values can be rich, including things like images, colours, and records, and will all be displayed inline. If the programmer's purpose is just to compute and display them, this happens automatically, and changes propagate live.

← Try it! Point any browser at [mwh.nz/demos/iss2022](http://mwh.nz/demos/iss2022) to use the system live, including all of these features. Works best on a tablet, but both phone and larger screens will work.

[mwh.nz/pubs/iss2022](http://mwh.nz/pubs/iss2022)