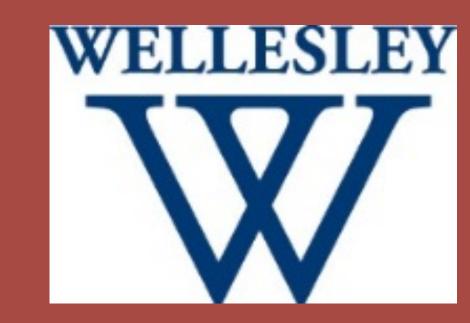
# Extending Quizly Bhargavi Ramanathan

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## About Quizly

App Inventor's blocks lower the barriers to learning programming, but make traditional testing of students difficult. Quizly, developed by Ralph Morelli, allows teachers to create blocks-based quizzes with sample solutions and hints. The three categories of quizzes differ in how a student response is compared to the teacher's solution:

- 1. **Expression Evaluation** the student's expression must evaluate to the same value as the solution
- 2. **Function Definition** the student's function must return the same values as the solution on a specified set of inputs.
  - 3. Exact Block-for-Block Match

## **Previous Limitations**

Function definition quizzes did not permit helper functions or global variables:

```
initialize global Y to (1)

+ to add2 var
return + get var + + 2 * get global Y \

+ to add2 x
return + get x + 2
```

Procedures that modified global variables could not be tested:

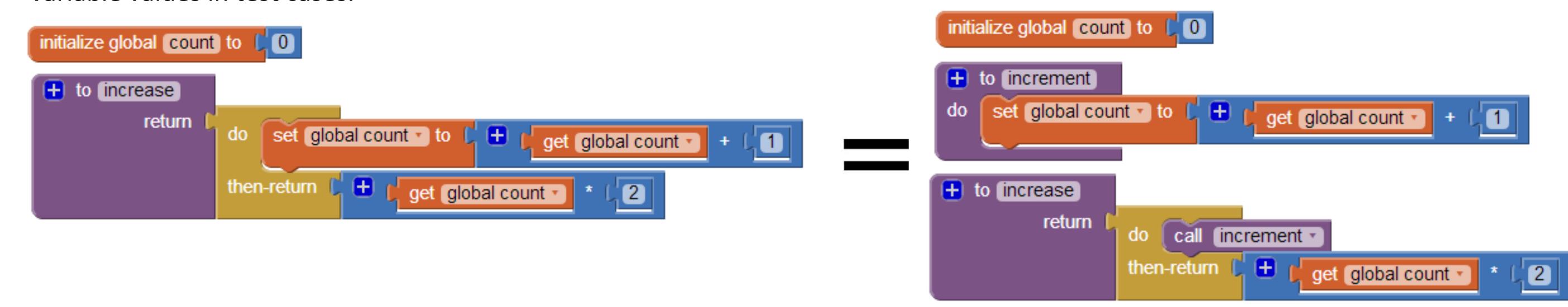
Student solutions to quizzes involving components had to match teacher solutions block for block:

```
when Button1 · .Click
do call Sound1 · .Play
call Sound1 · .Vibrate
millisecs 500
```

### Progress Made

#### Handling of helper functions and global variables in function definitions:

The code for all top-level blocks in the workspace, not just for the function definition in question, is generated, and the results of calling the teacher and student functions on the teacher-provided sample inputs are compared. This permits the use of helper functions. Quizzes that involve modifying global variables are tested by comparing the values of certain global variables specified by the teacher after the teacher's and student's code has executed. The quiz creation interface was modified to allow specifying global variable values in test cases.



#### Basic Quizzes involving event handlers

Event handlers that modify global variables can now be tested. Some work has been done on Buttons, and Buttons that modify the text of a label can now be tested.

```
initialize global x to
     Button1 - .Click
   set global x to to get global x +
                                                                                                   modulo of get global x = +
                                                                                               set Label1 . Text to . Odd
                                                                                              set Label1 . Text to F Even
                            initialize global 🗶 to 💢 🔾
                                                                                                                          initialize global 🗶 to 📜 15
                                   Button1 . Click
                                                                                                                          to xMod2
                                                                                                                                      modulo of get global x
                           to incX
                                                                                                                                     call xMod2 = = 1
                                  set global x v to
                                                                                                                                     Label1 . Text to
                                                                                                                                    et Label1 . Text to 📜 "Even '
```

## Future Work

#### More complex quizzes involving components:

```
when Button1 · .Click
do call score ·
call Sound1 · .Play

+ to score
do set global Score · to  get global Score · + 1

set Label1 · . Text · to  get global Score ·
```