



Improving Searching and Zooming in App Inventor



Cecellia Tsui '18 and Jacqueline Young '18

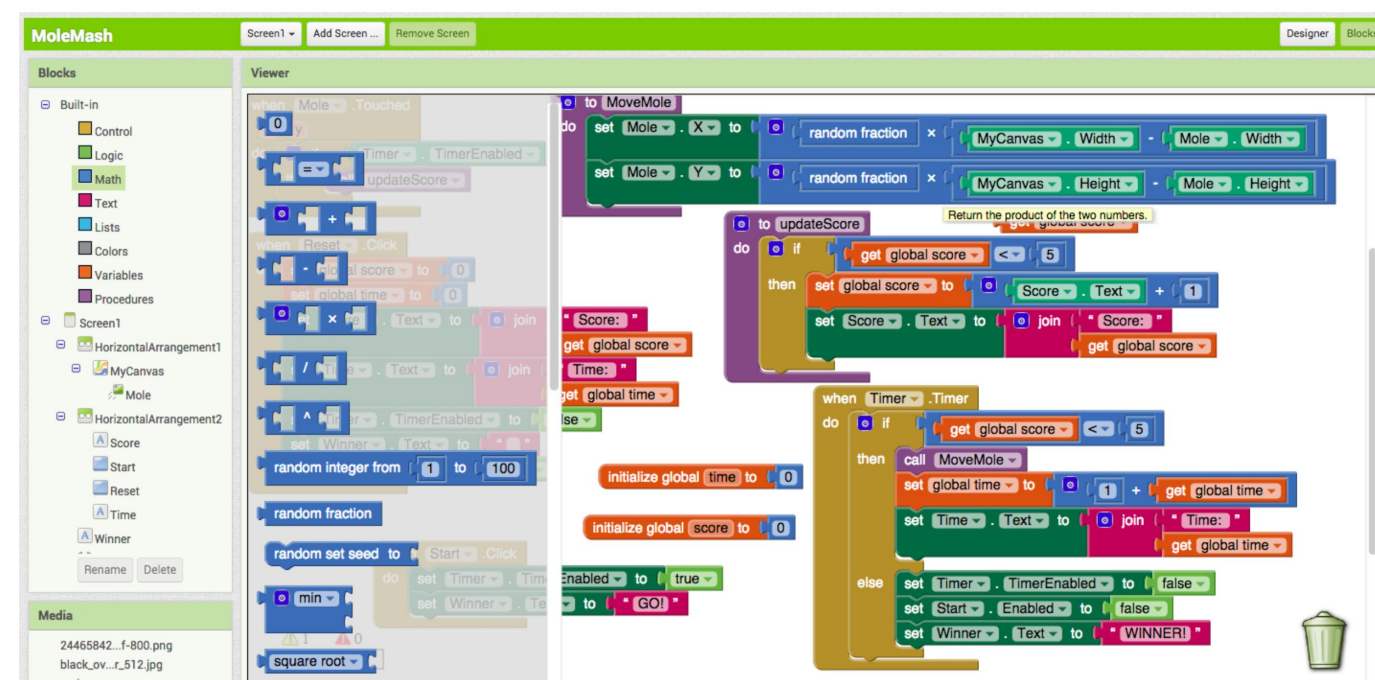
Advisor: Franklyn Turbak, Wellesley College Computer Science Department

App Inventor Background

App Inventor is a blocks programming environment that empowers users to be creators rather than consumers of Android apps. The behavior of apps is specified by visual blocks that resemble jigsaw puzzle pieces. Blocks languages make it easier to create syntactically correct programs and often have blocks that abstract over useful high-level behaviors.



On the designer side, users can select and add components for their app.



On the blocks editor side, users specify the behavior of their components.

Project Goals

Blocks take up significant space on the screen, making it impossible to see all of the blocks, even for moderately sized applications. Mechanisms like searching and zooming are necessary to navigate through the blocks. Currently, App Inventor provides searching and zooming through the browser, but these features have problems.

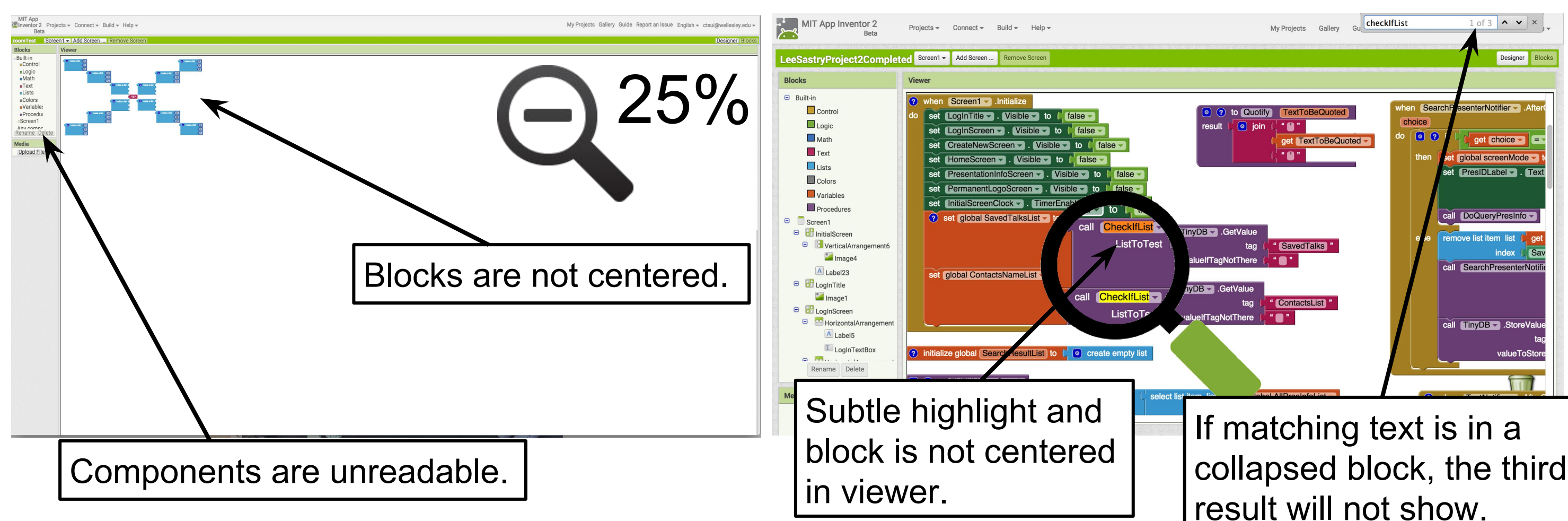
Searching (Ctrl+F)

- The mechanism only highlights the text, which is too subtle for colorful blocks.
- When using the arrow buttons to navigate through the matching text, relevant blocks are not centered.
- If a matching block is within a block that is collapsed to save space, the browser will not display the matching block.

Zooming (Ctrl++, Ctrl+-)

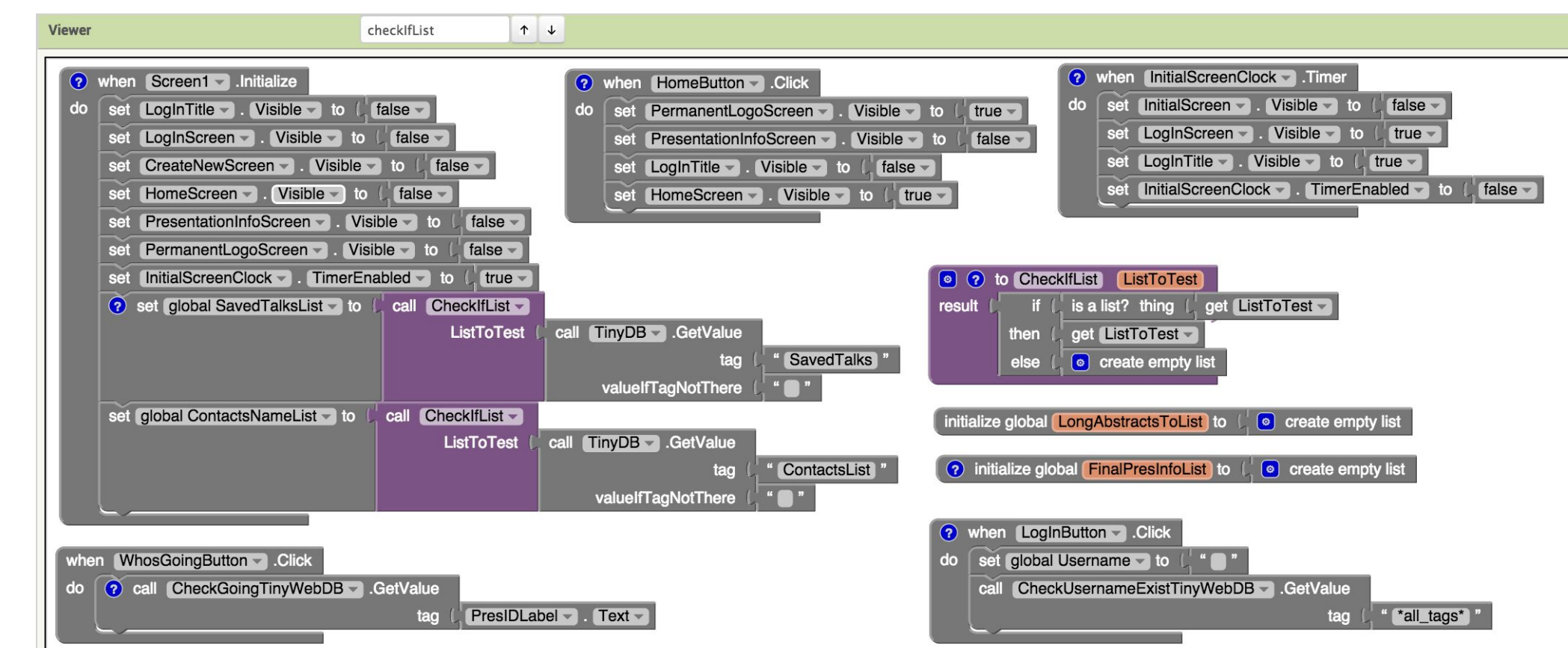
- Everything is scaled within the browser window, rather than just the blocks workspace.
- There is no way to choose a center point for zooming.

We designed and implemented features to address these issues.

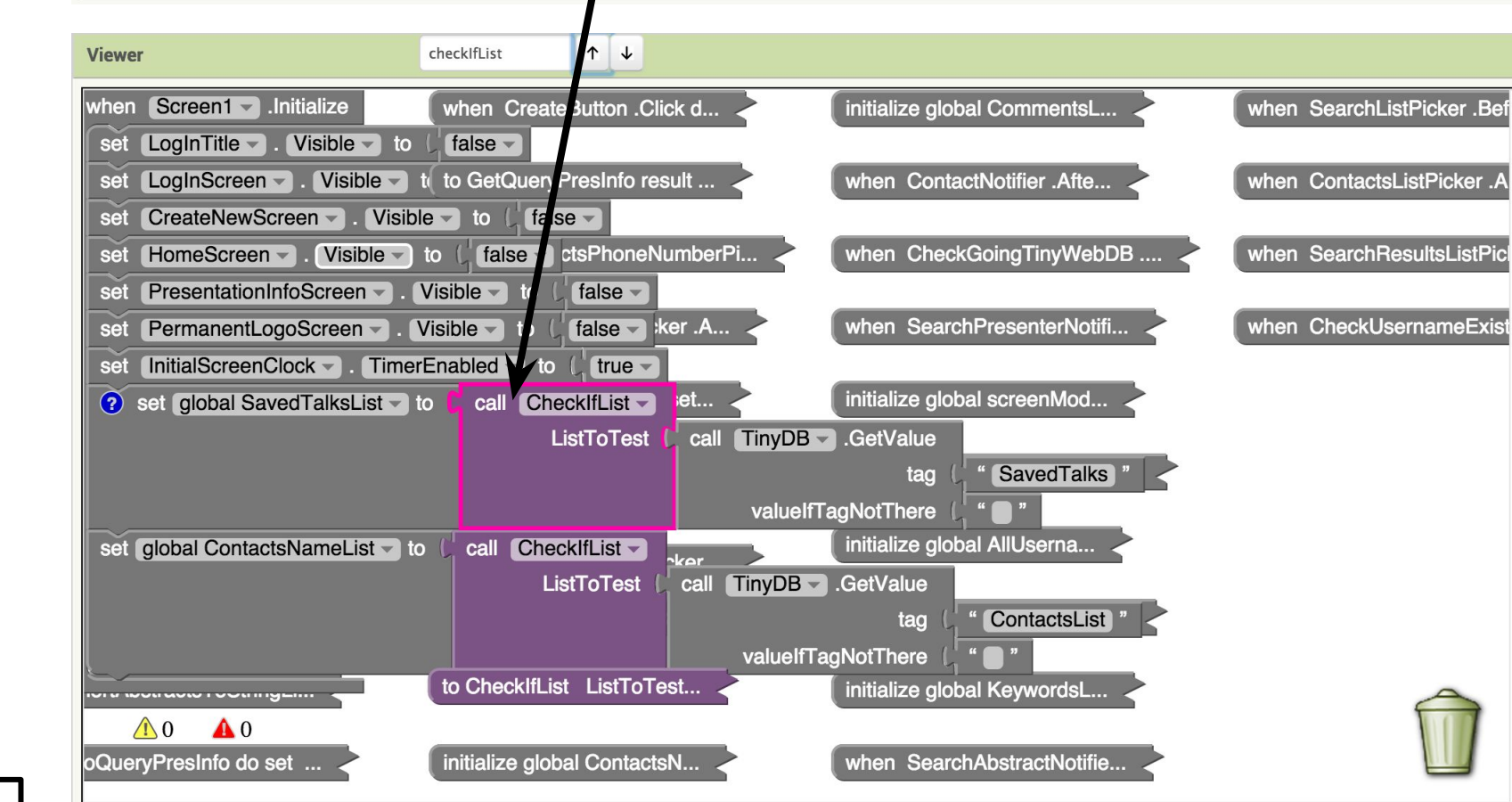
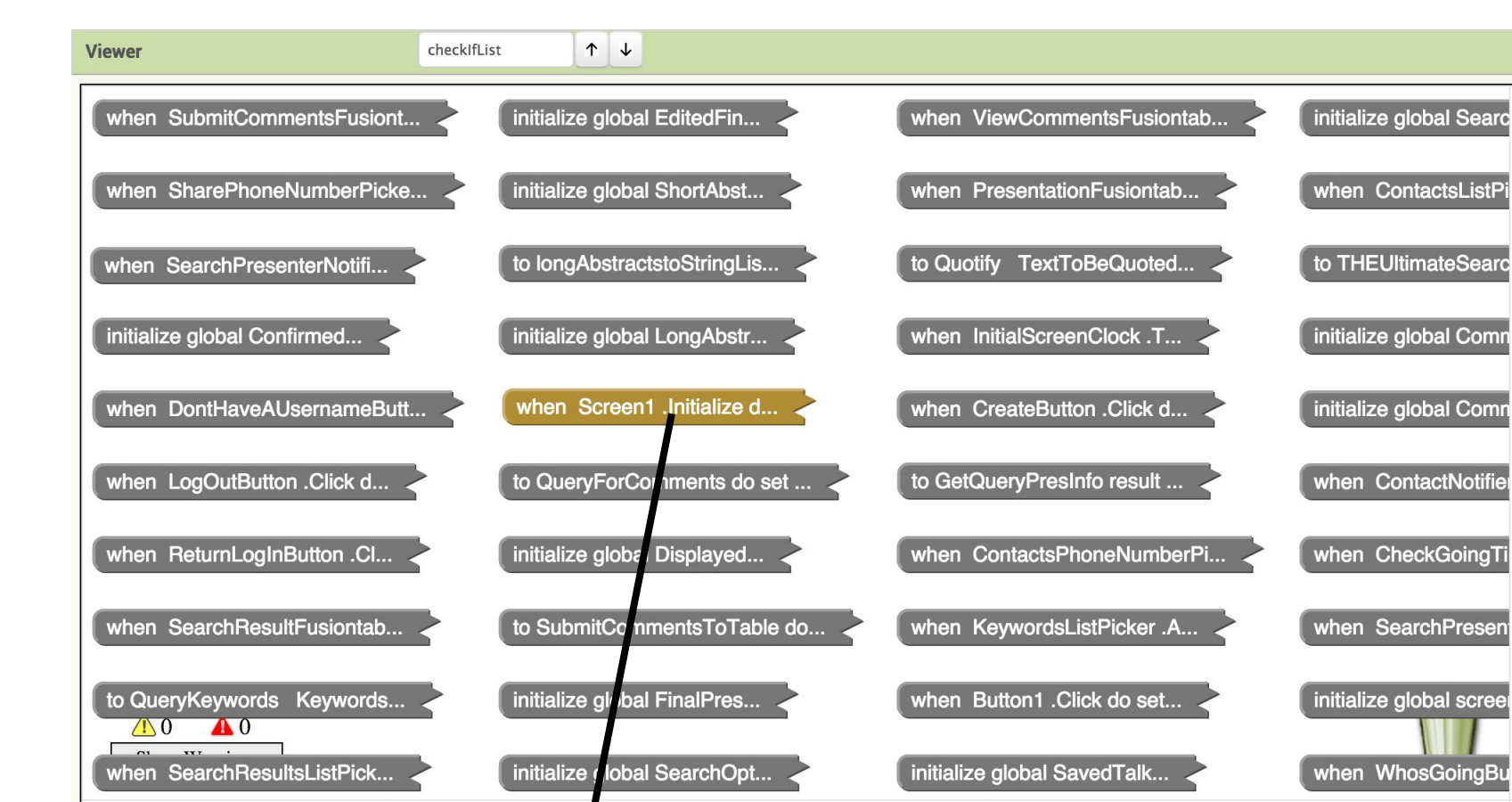
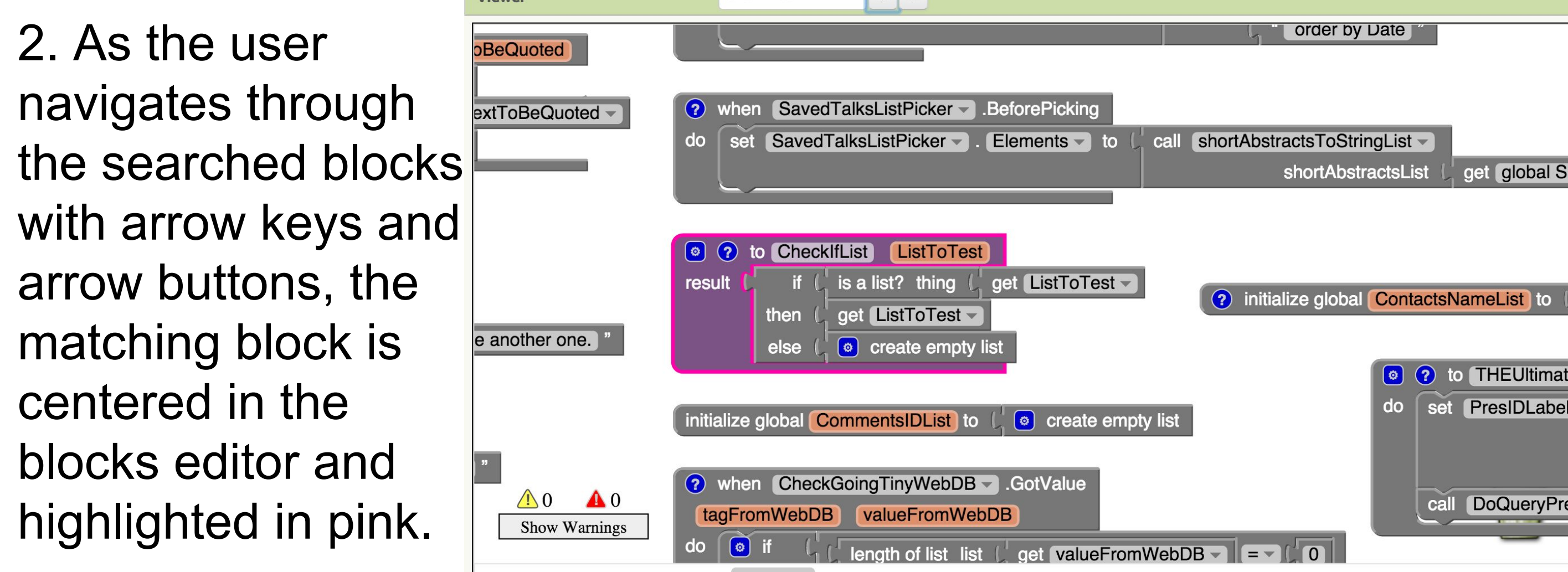


Searching

Cecellia implemented a new search box at the top of the blocks editor viewer that is particular to the needs of App Inventor. It is similar to the browser's default Ctrl+F search mechanism, but with three main improvements:



1. After a search query is entered, irrelevant blocks are greyed out, emphasizing the matching colored blocks to the users.

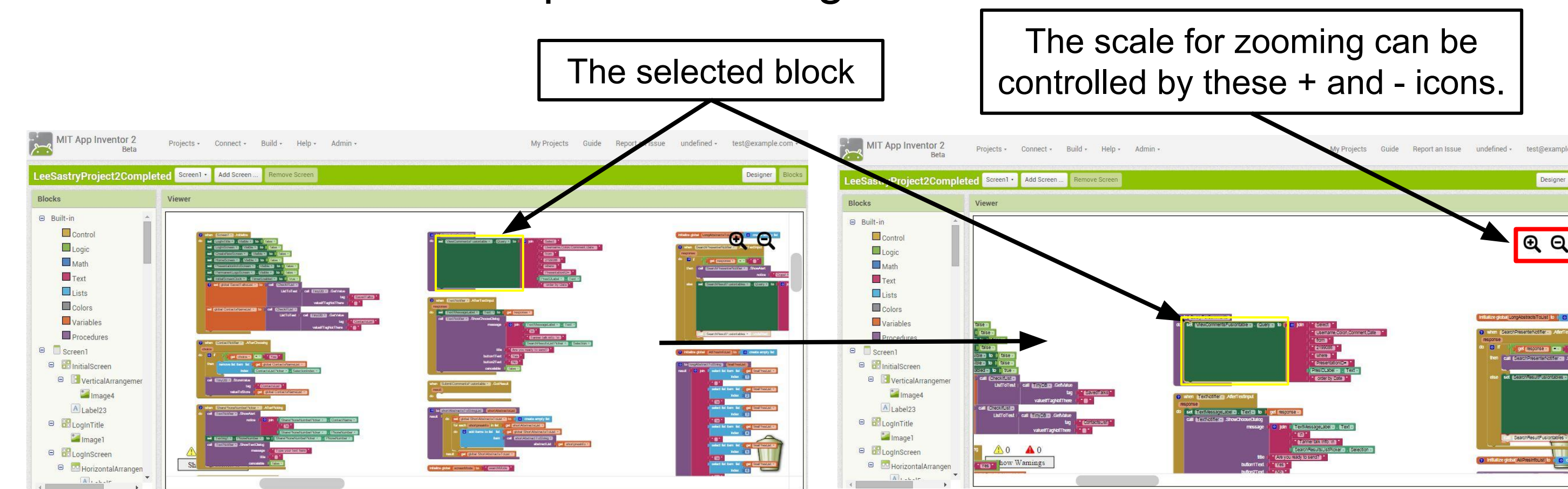


2. As the user navigates through the searched blocks with arrow keys and arrow buttons, the matching block is centered in the blocks editor and highlighted in pink.

3. Blocks can be collapsed to save space on the workspace. If a matching block is within a collapsed block, the parent block of the collapsed block will still be colored to indicate it contains a match. In addition, as the user navigates to this block with the arrow keys, the collapsed block will expand and center the block accordingly, re-collapsing when navigating to the next matching block.

Zooming

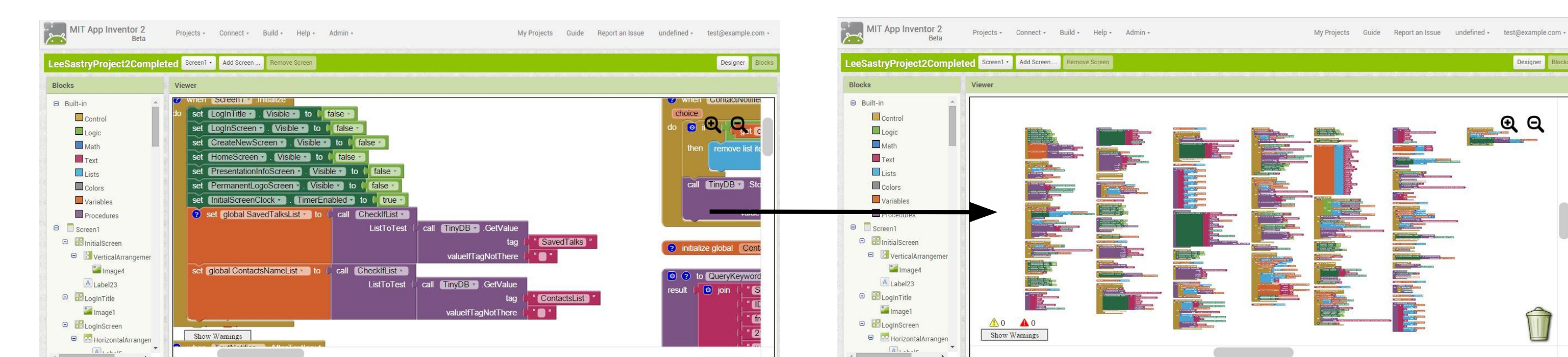
The current method offered for zooming can be especially disorienting and frustrating for users with substantial projects, and trying to zoom in to a particular area of code can be almost impossible. Expanding on a zooming feature started by Xixi (Shirley) Lu '15, Jacqueline implemented a zooming functionality that now allows users to select a particular block they would like to zoom to, and centers it in the viewer of the blocks editor while the scale of only the blocks editor workspace is changed.



After selecting a block and clicking either zoom icon, that block will be centered in the blocks editor workspace.

When a block is not selected, zooming defaults to the center of where the viewer is currently located in the workspace.

Being able to zoom in and out while controlling the center point of the viewer makes a substantial impact on App Inventor's user interface. Users can clearly better see the high-level structure of their program, and can navigate to any particular block with relative ease.



Future Work

- There is still work that needs to be done with fully integrating zooming with other features of the App Inventor workspace.
- Searching needs to be compatible with folders, a new organizing feature implemented by Xixi (Shirley) Lu '15 and Devid Farinelli.
- Searching and zooming can be integrated to provide more context when searching, and to make navigation as a whole more efficient.
- The final goal is to make these features available in the public version of App Inventor.