CptS 443/543—Human-Computer Interaction Rusu Wu 11694764

Cognitive Walkthrough Form

Briefly describe the system being evaluated:

The ALgorithm VIsualization Storyboarder (ALVIS) is a software that assists students to learn program algorithms. With this software, users can create array and variables to achieve simple algorithms.

Briefly describe the target users of this system (background, experience, etc.):

The target user of this software are new learners of program algorithms, especially the undergraduate students who are majoring in Computer science.

Briefly describe the task(s) to be evaluated:

The task is to achieve a algorithm called “find max”. In order to compare the random variables and to find the maximum, users create a array with 6 cells and one cell of variable called maxsofar. By comparing two of the variables in order, once the new variable is larger than the old one, place it into the variable cell. Finally, by the end of the process, the number inside the maxsofar should be the largest number of the random variables.

Task 1: Create an array

Task Steps for Task 1	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
1.1 **Click on the specific window and draw an array**	It is obvious that the button of creating an array is on the right side. Also, there is a window box telling how to make an array, so users can know what the next progress would be.	User would face a trouble about finding the window to click, because there is no such signifier of windows names. Moreover, users may don't know how to make a array since making an array need to click the left mouse button and move some space before releasing it.	Array would appear as users do the right operation. However, when user move the mouse to create specific number of array cells, they may create with wrong number of cells. So user need to try again to correct the number of cells.

Task 2: Populate the array

Task Steps for Task 2	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
2.1 **Click the populate array tool**	There is a signifier on the right side, it is easy for users to finish this step.	After users click the tool, there would be an window box appear. Inside the box, it briefly describe how to populate, so I think the correct action is easy to be finished.	When users clicking on the array with the tool as what the box says, there would be a random variable appear in each array cell. This is obvious that users can interpret the system response correctly.

Task 3: Create a maxsofar variable

Task Steps for Task 3	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
3.1 **Click "create variable" button**	The button is on the top right side; users can finish this step easily.	The appearing window box would notify how to do next, one difficulty is that user may don't know the location of animation window as I say in the step one.	User can interpret the system response correctly.
3.2 **Change the name of the variable to be maxsofar.**	There is no reminder or some words to notify users where to or how to change name. Therefore, user would confuse on this step.	User would confuse because we need to change the name on the window named script editor. There is no such changing name button on any other windows. Maybe we need to add more words on box that appear in the previous step telling about how to change variable's name.	If users figure out the changing method and do it in the right way. To explain, click the variable's name in the script editor widow, and there would be a rectangle appear. Users can change the name inside the rectangle.Therefore, users can interpret the system response correctly.

Task 4: Create array index

Task Steps for Task 4	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
4.1 **Click the "create index" tool**	Since the button is on the right side on the window, user can figure it out easily.	After users click the button, a box would appear. It tells users what to do next.	The appearing box tells what to do next and would would appear when user do the right work. Users can interpret the system response correctly by the help window.

Task 5: Iterate loop for the index

Task Steps for Task 5	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
5.1 **Click the "iterate loop "button**	Iterate loop button is easy to be found, and users can know what to do next to make progress.	The help window box briefly tells what to do next, but the description is not enough. I suggest to add more words to describe this step. For example, "click on the left mouse button choosing one index and move the point to the last cell of iteration before releasing it"	When user do this step correctly, the only feedback is on the scrip editor. Since the feedback is no obvious, it may bring confuse whether they have finished the iteration or not to users. I suggest that after the iteration finished, a window box appears, and the box tells what have done.

Task 6: Use if tool to achieve "find max"

Task Steps for Task 6	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
6.1 **Click "if tool"**	Users know what to do next to make progress because the button is easy to find.	Following the instruction, user could know what step to do next. One thing should be optimized is that users may don't know what is the meaning of i1, a1[1] and a1[0], so it need some illustration to help users to figure it out.	If users follow what the appearing boxes says, users can interpret the system response correctly.

Task 7: Set maxsofar to be the first variable

Task Steps for Task 7	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
7.1 **Click "Set "button and modify maxsofar**	Users know what to do next to make progress because the button is easy to find.	Same as the previous step,it is easy to achieve with help box. However the previous trouble still exist; users may don't know what is the meaning of i1, a1[1] and a1[0], so it need some illustration to help users to figure it out.	If users follow what the appearing boxes says, users can interpret the system response correctly.

Task 8: Execute the algorithm

Task Steps for Task 8	Will the user know what to do next to make progress?	Will the user notice how to perform the correct action?	Will the user interpret the system response correctly?
8.1 **Click "play forward" to Execute the algorithm**	The signifier of play forward is implicit. Therefore it may cause troubles to new users to find the button. Suggestion: to change the implicit signifier to be explicit.	If the users can find where the button is, they can notice how to perform the correct action easily.	After click the button, the algorithm would run on; users interpret the system response correctly because it can be a common sense.

Summary of results:

Aspects of design that worked: [

1. The toolbox in the left side has simple signifier for each tool.
2. Help box window would appear when click on each tool, helping users to have right actions.
3. Visibility of system status when clicking play forward.

]

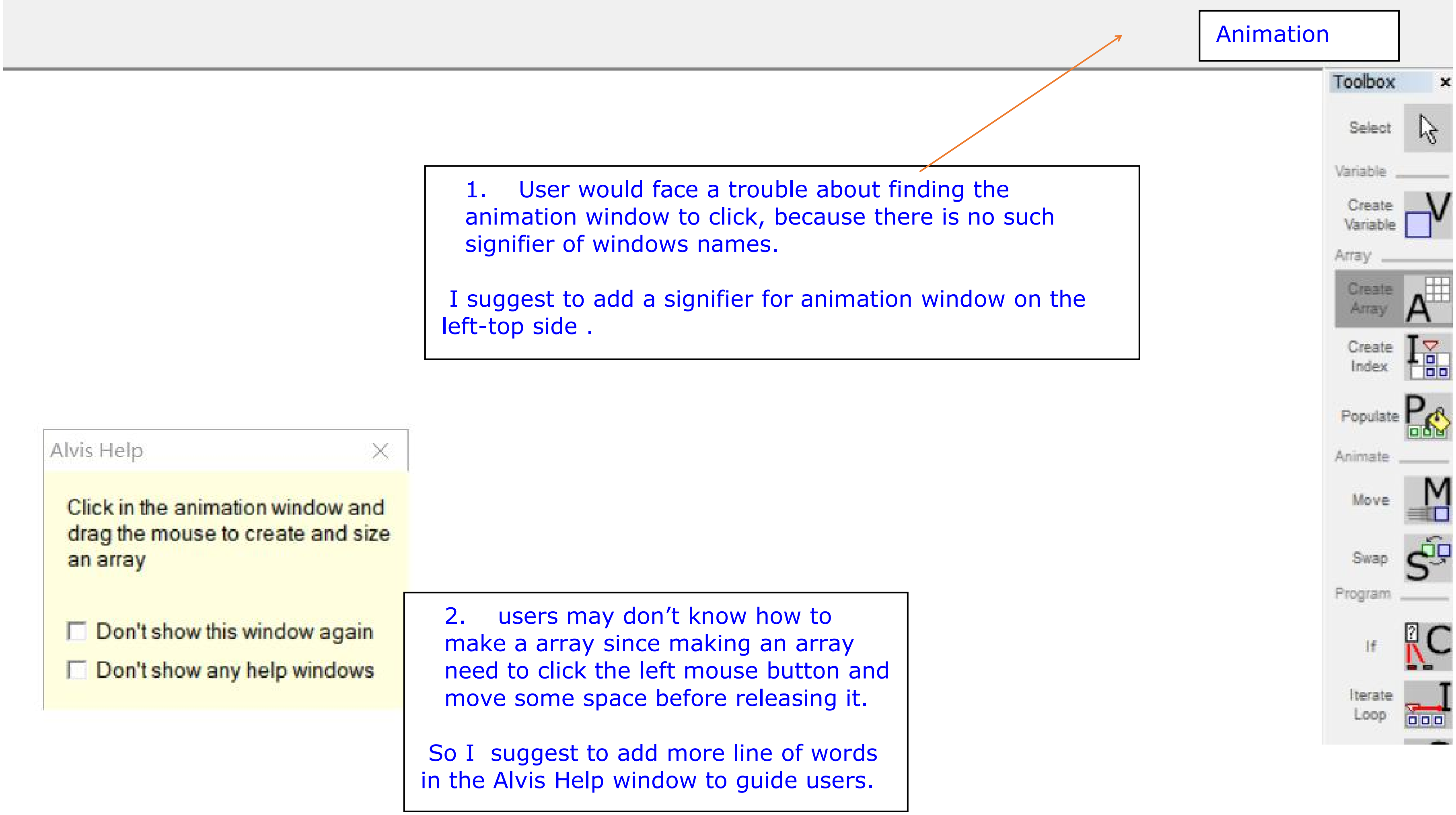
Potential usability issues: [

1. User would face a trouble about finding the animation window to click, because there is no such signifier of windows names.
2. Users may don’t know how to make an array since making an array need to click the left mouse button and move to the last cell before releasing it.
3. When users iterate loop, the help window box briefly tells what to do next, but the description is not enough.
4. Don't offer informative feedback. Since the feedback of finishing loop iteration is not obvious, it may bring confuses whether they have finished the iteration or not to users.
5. Don’t help users recognize some key elements. The signifier of play forward is implicit. The trouble is to the visuality. Therefore it may cause troubles to new users to find the button.

Proposed Design Changes:

For each usability issue, suggest a concrete design change that could remedy the issue. You are encouraged to use annotated sketches to illustrate your suggested design changes.

1. Creating an array



1. User would face a trouble about finding the animation window to click, because there is no such signifier of windows names.

I suggest to add a signifier for animation window on the left-top side .

Alvis Help

Click in the animation window and drag the mouse to create and size an array

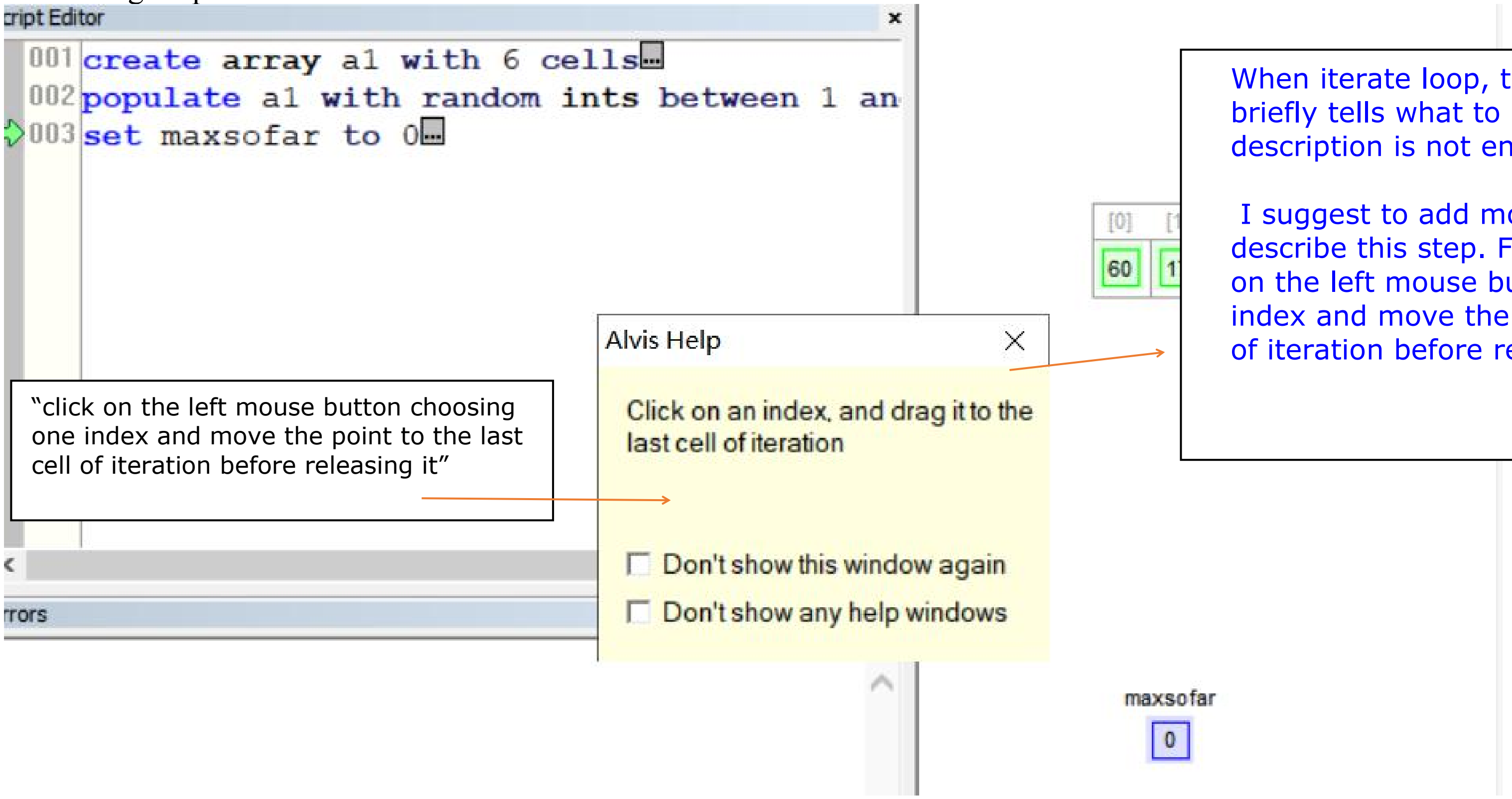
□ Don't show this window again

□ Don't show any help windows

2. users may don’t know how to make a array since making an array need to click the left mouse button and move some space before releasing it.

So I suggest to add more line of words in the Alvis Help window to guide users.

2. Iterating loop



```
create array a1 with 6 cells
populate a1 with random ints between 1 an
set maxsofar to 0
```

Alvis Help

Click on an index, and drag it to the last cell of iteration

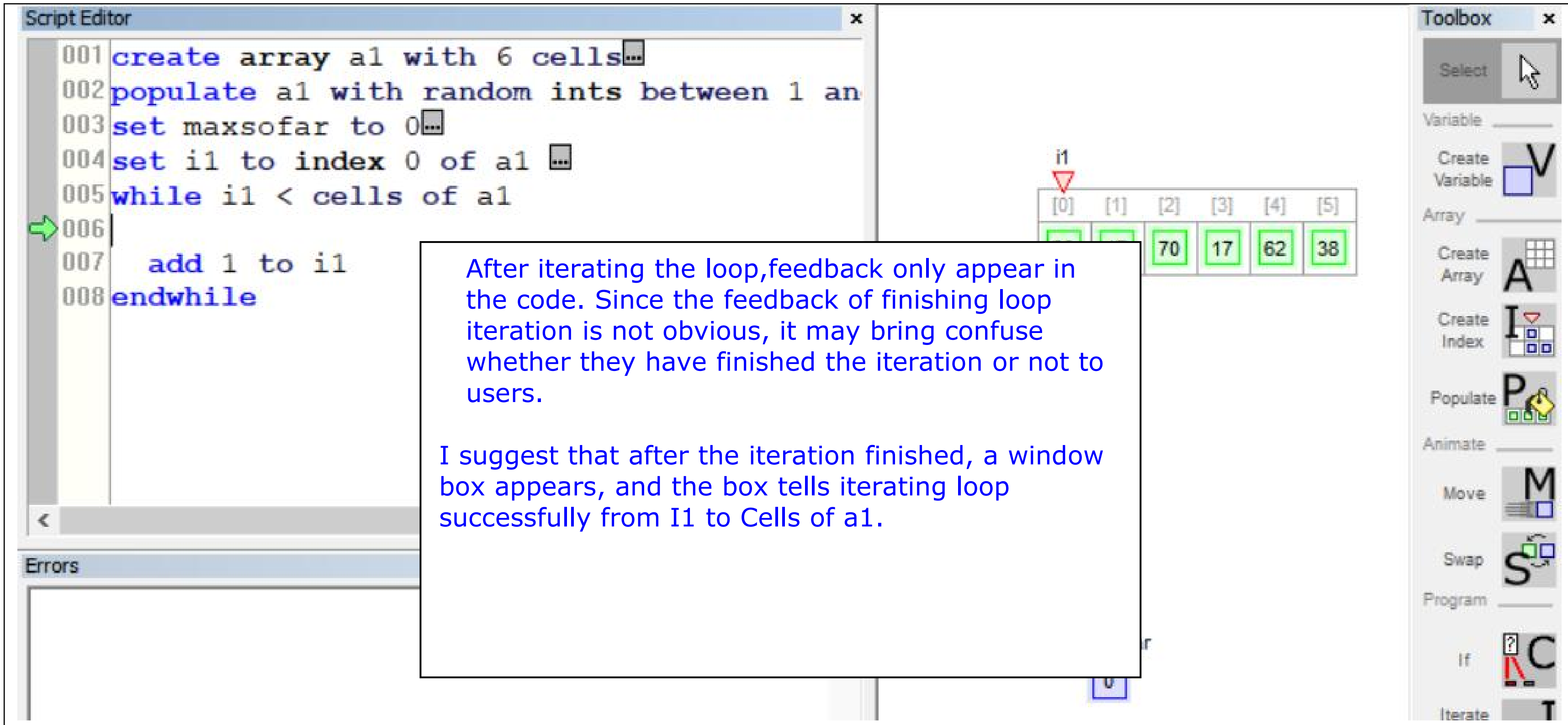
□ Don't show this window again

□ Don't show any help windows

"click on the left mouse button choosing one index and move the point to the last cell of iteration before releasing it"

When iterate loop, the help window box briefly tells what to do next, but the description is not enough.

I suggest to add more words to describe this step. For example, "click on the left mouse button choosing one index and move the point to the last cell of iteration before releasing it"

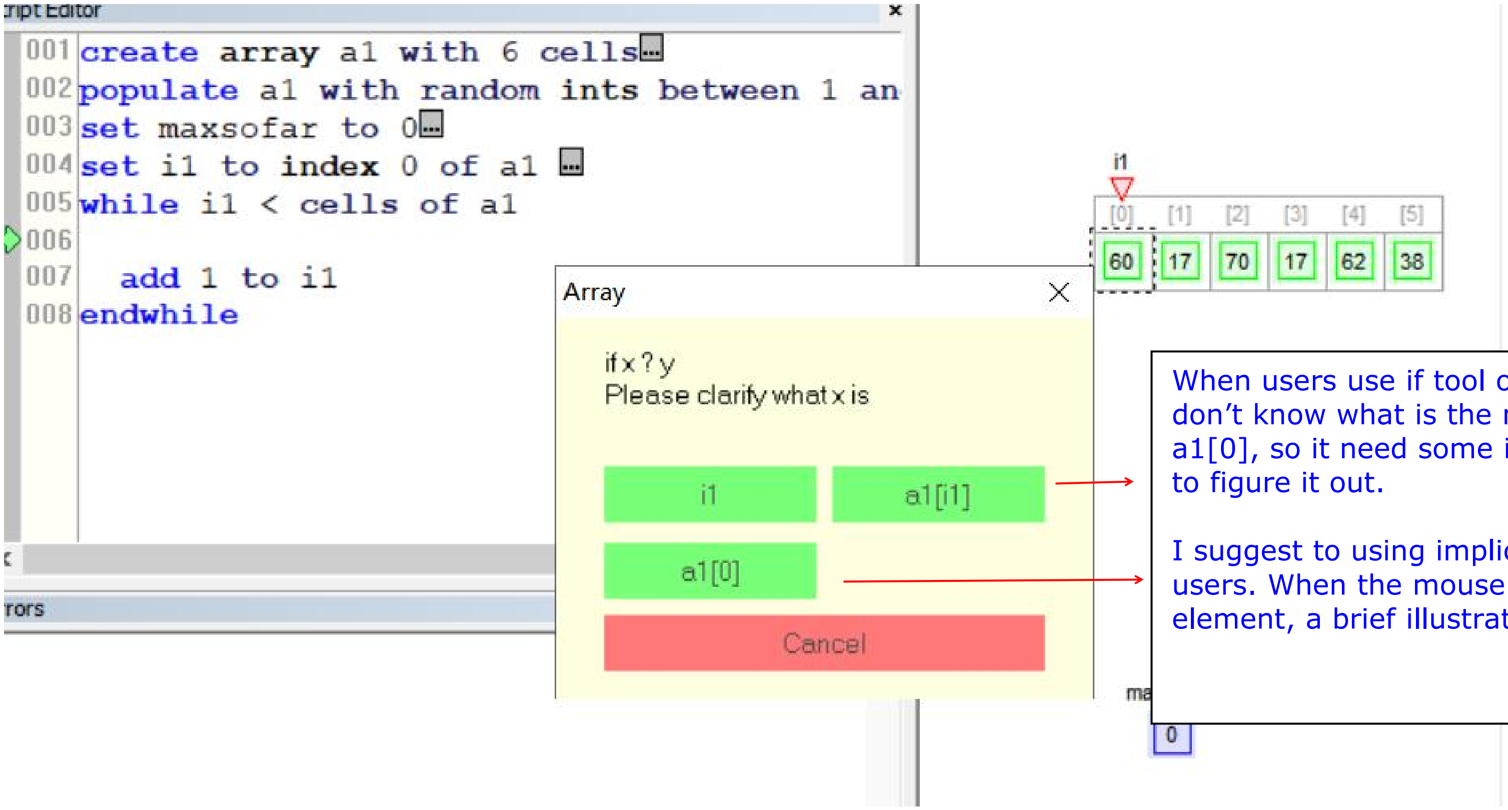


```
create array a1 with 6 cells
populate a1 with random ints between 1 an
set maxsofar to 0
set i1 to index 0 of a1
while i1 < cells of a1

   add 1 to i1
endwhile
```

After iterating the loop,feedback only appear in the code. Since the feedback of finishing loop iteration is not obvious, it may bring confuse whether they have finished the iteration or not to users.

I suggest that after the iteration finished, a window box appears, and the box tells iterating loop successfully from I1 to Cells of a1.

3.Using if tool



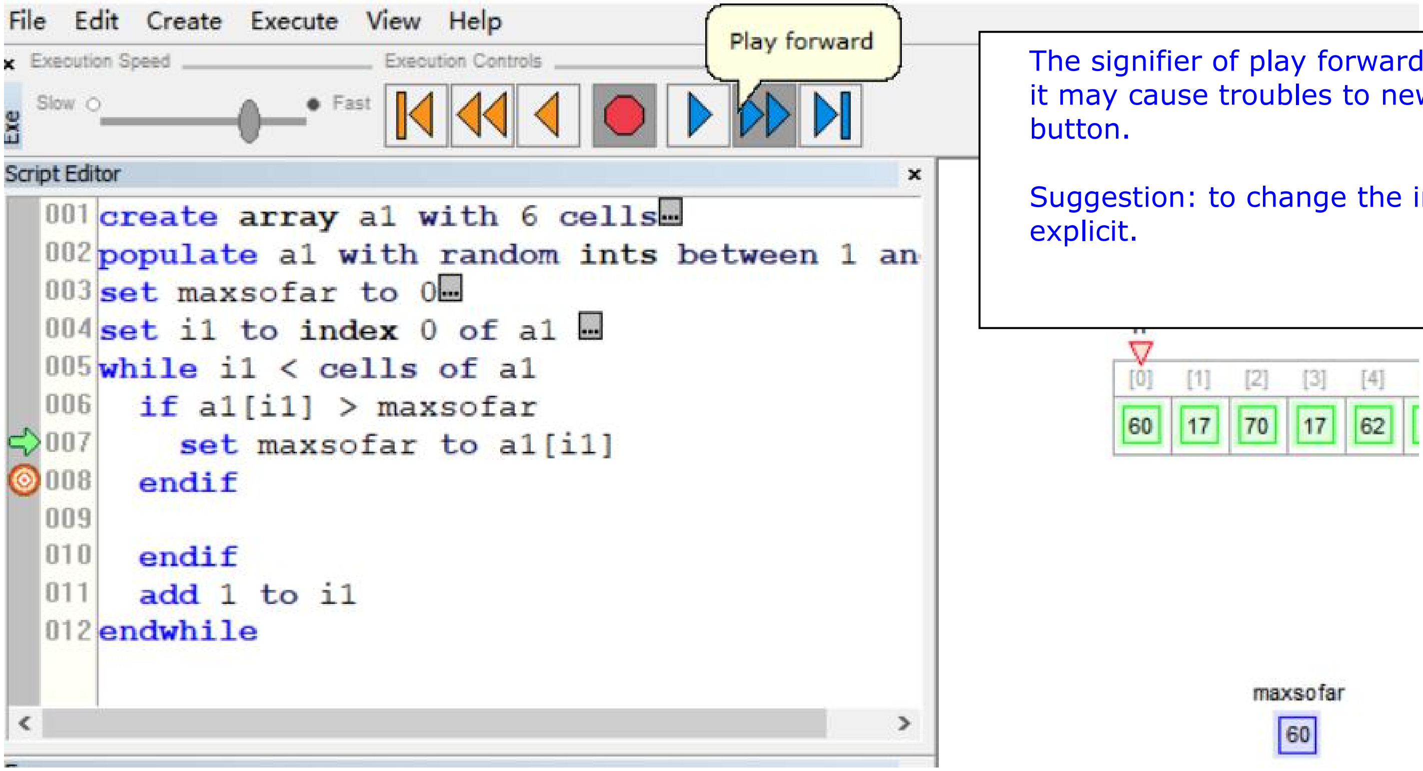
```
create array a1 with 6 cells
populate a1 with random ints between 1 an
set maxsofar to 0
set i1 to index 0 of a1
while i1 < cells of a1

  add 1 to i1
endwhile
```

if x ? y
Please clarify what x is

When users use if tool or set tool, users may don’t know what is the meaning of i1, a1[1] and a1[0], so it need some illustration to help users to figure it out.

I suggest to using implicit signifiers to inform users. When the mouse point states on the element, a brief illustration appears.

3. Playing forward



```
create array a1 with 6 cells
populate a1 with random ints between 1 an
set maxsofar to 0
set i1 to index 0 of a1
while i1 < cells of a1
  if a1[i1] > maxsofar
    set maxsofar to a1[i1]
  endif

  endif
  add 1 to i1
endwhile
```

The signifier of play forward is implicit. Therefore it may cause troubles to new users to find the button.

Suggestion: to change the implicit signifier to be explicit.