

# Cognitive Walkthrough

## Group members

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### Users/Team Details:

Three types of users/evaluators are used who are interested in learning basic sorting techniques.

User/Academic Level	User Category
15 years old, school student. No prior experience with sorting game apps, and a faint assumption on how the app might work.	Novice
20 years old, college student with limited prior experience with similar apps, and somewhat idea of what the app might be.	Intermediate
18 year old college student with prior experience with similar app and know basic Sorting Techniques	Expert

### Tasks (including screenshots) for evaluation along with action sequences:

#### 1. Start game:

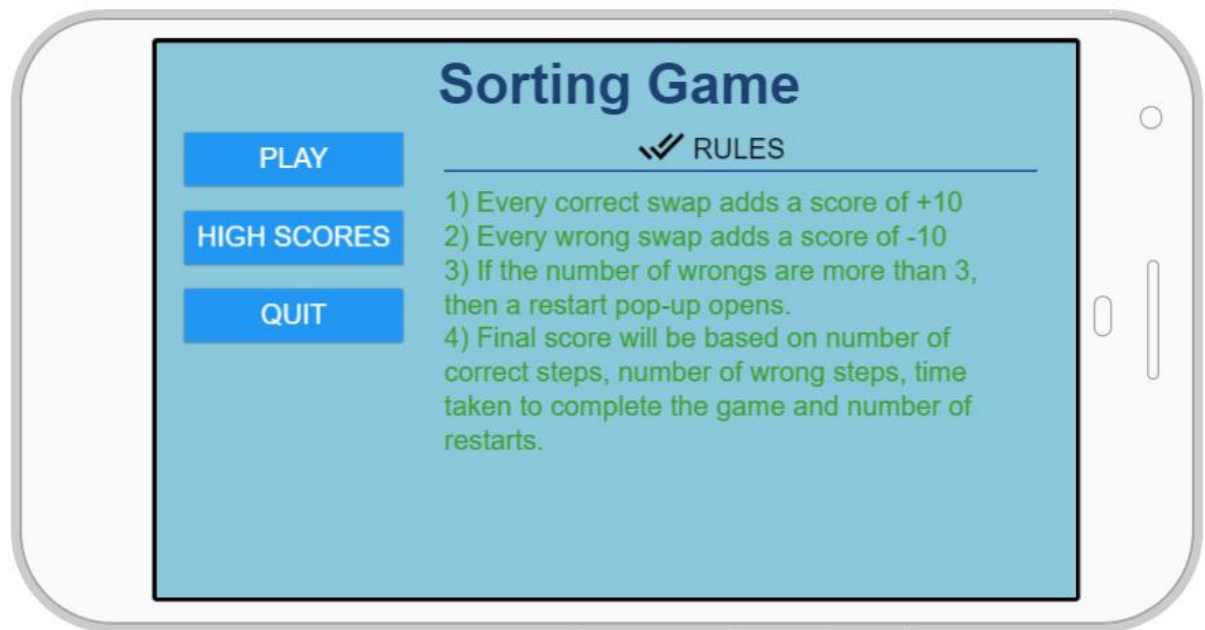
Description: The user has to start a sorting game (can be any sorting) by

starting the android app and going through all the options.

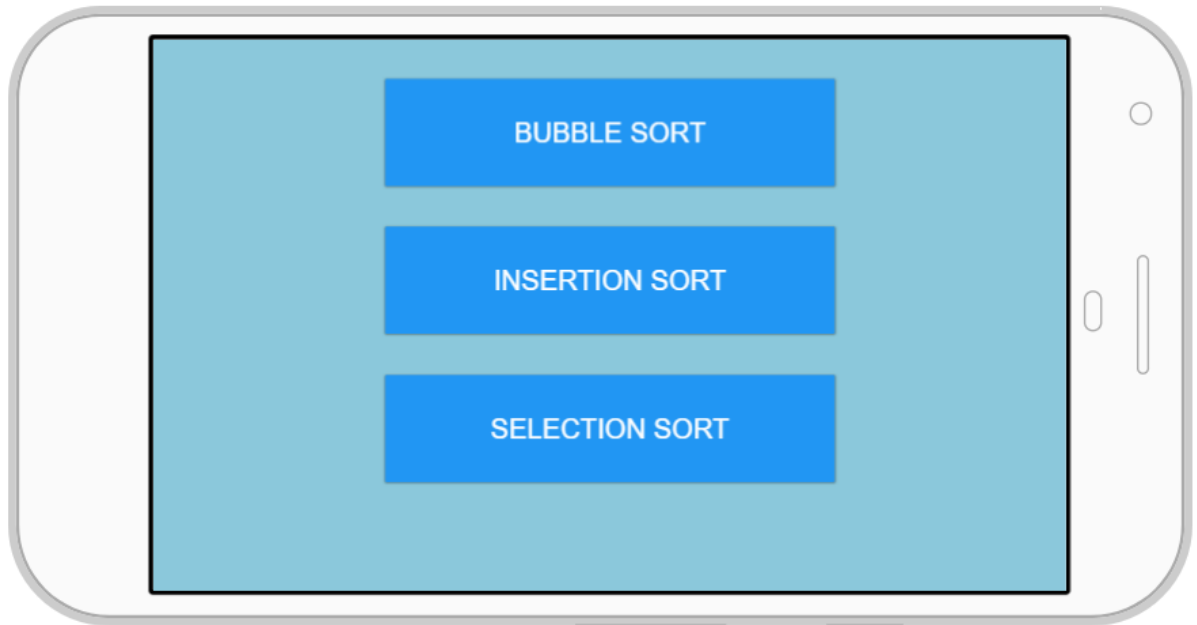
Action Sequence:

1) The user clicks on the app in his/her smart phone. (result: the app opens and the main menu is displayed.)

2) The user has to click on the play game button. (result: the app takes the user to the next menu in which he/she has to select the type of sort he has to play.)



3) The user has to select the type of sort he/she has to play. (result: the rules for the sort he has selected are displayed.)



4) The user has to see the rules and enter his/her name and press the start button.(result: the game is started successfully.)



## 2. View high scores:

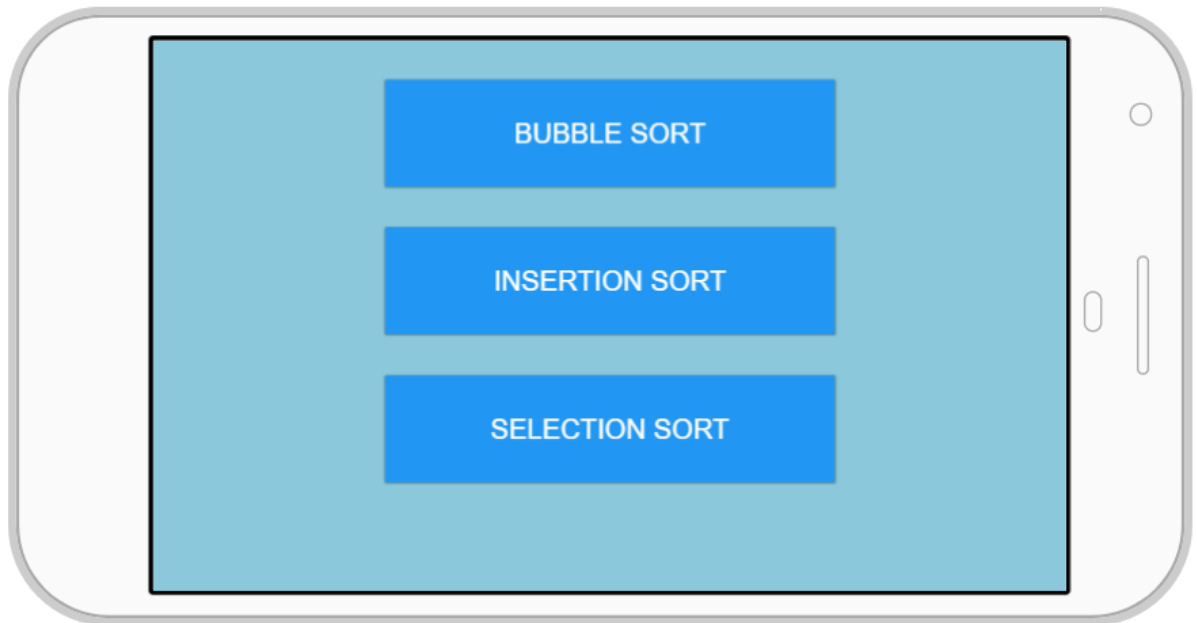
Description: The user has to view the high scores by selecting options from the main menu onwards.

Action Sequence:

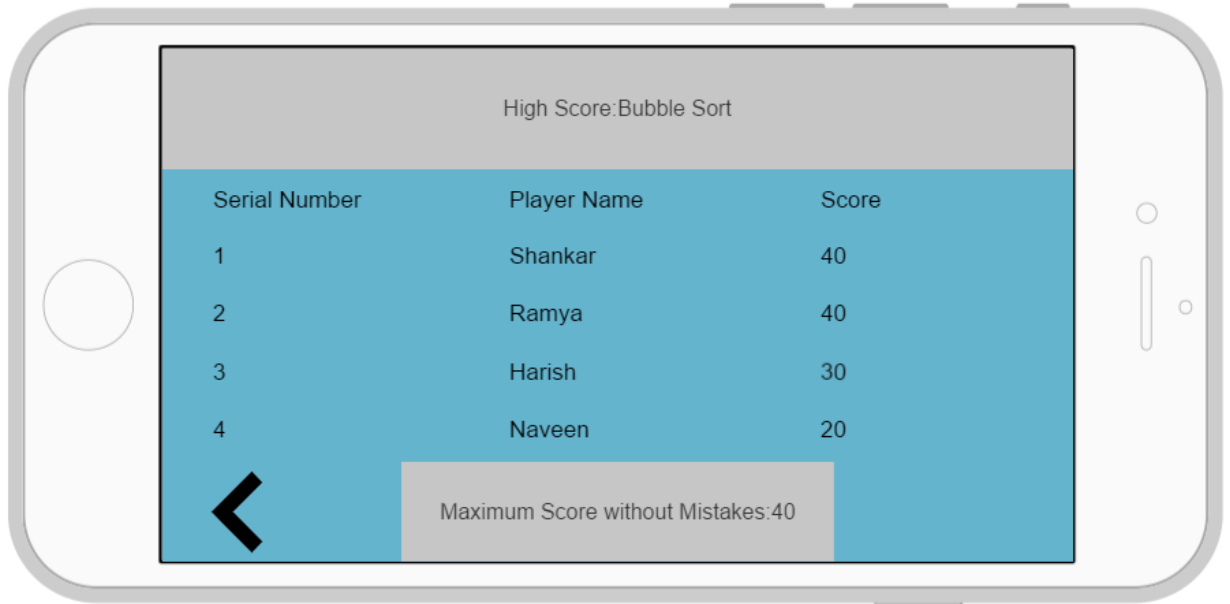
1) The user has to select the high scores option in the main menu.(result: another menu opens that contains which has types of sorts.)



2) The user has to select the type of sort for which he has to view high scores.(result: high scores are displayed.)



3) The user then should navigate back to the main menu by using back buttons.(result: the main menu is displayed.)

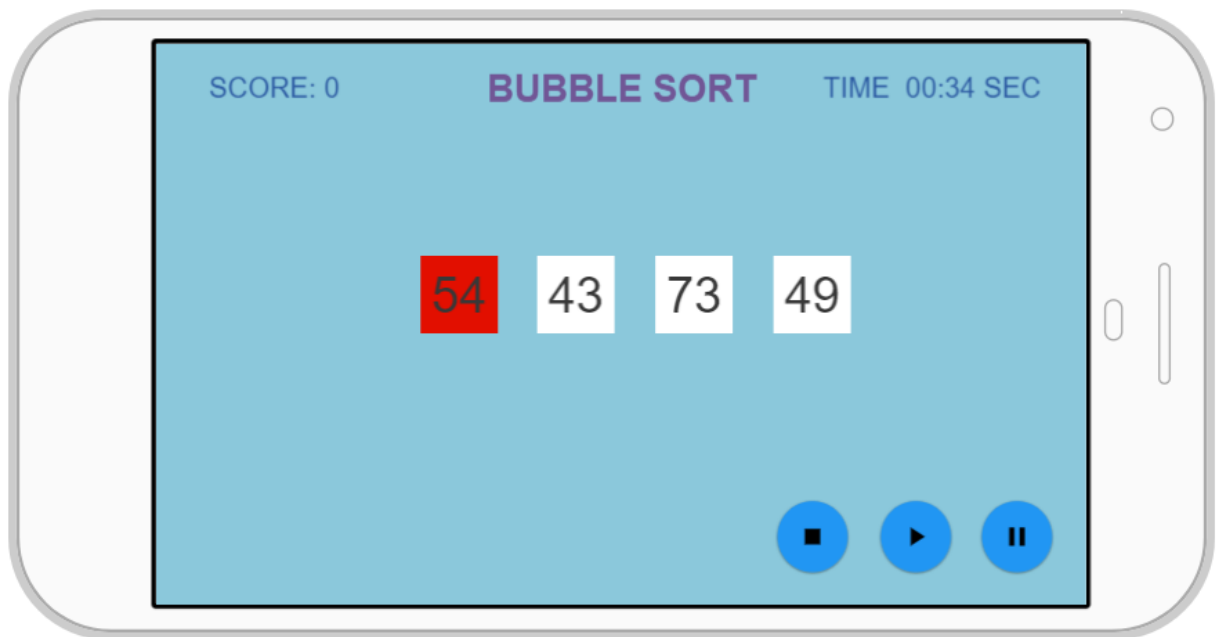


### 3. Play bubble sort game:

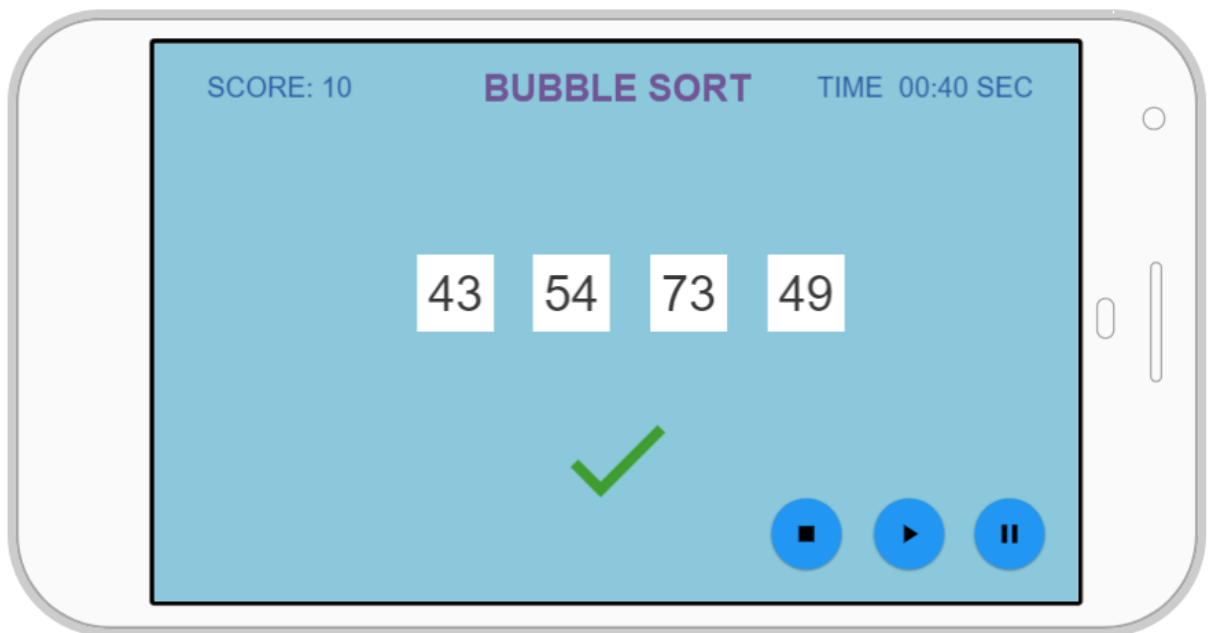
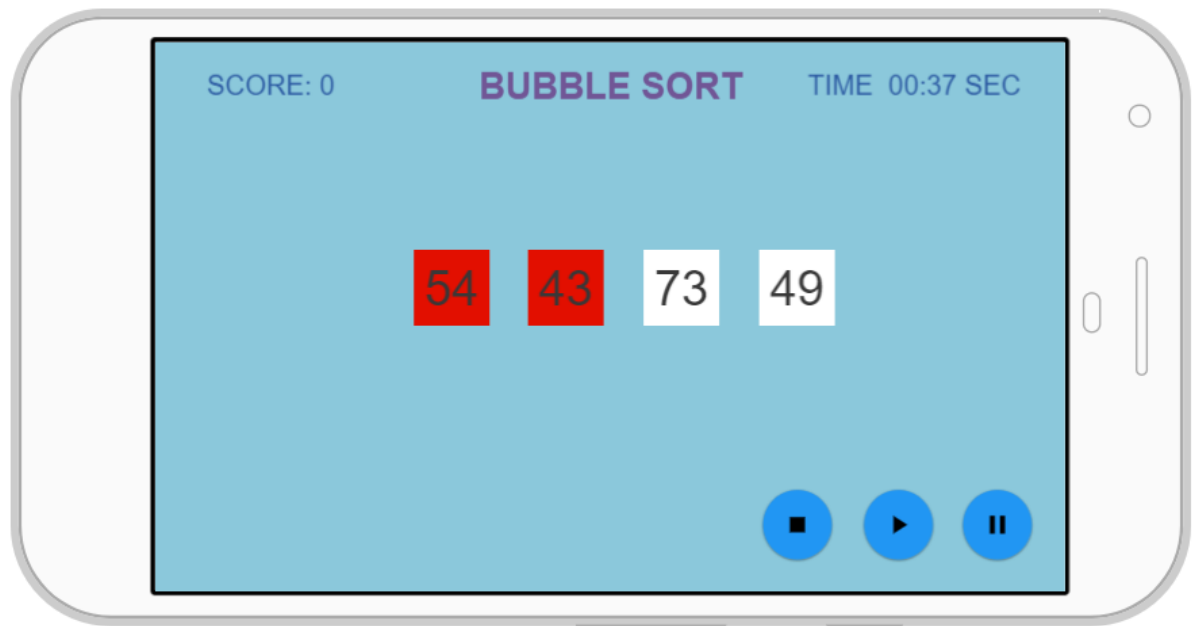
Description: The user has to play the bubble sort game by selecting two numbers and swapping them. He has to play the game until the game ends.

#### Action Sequence:

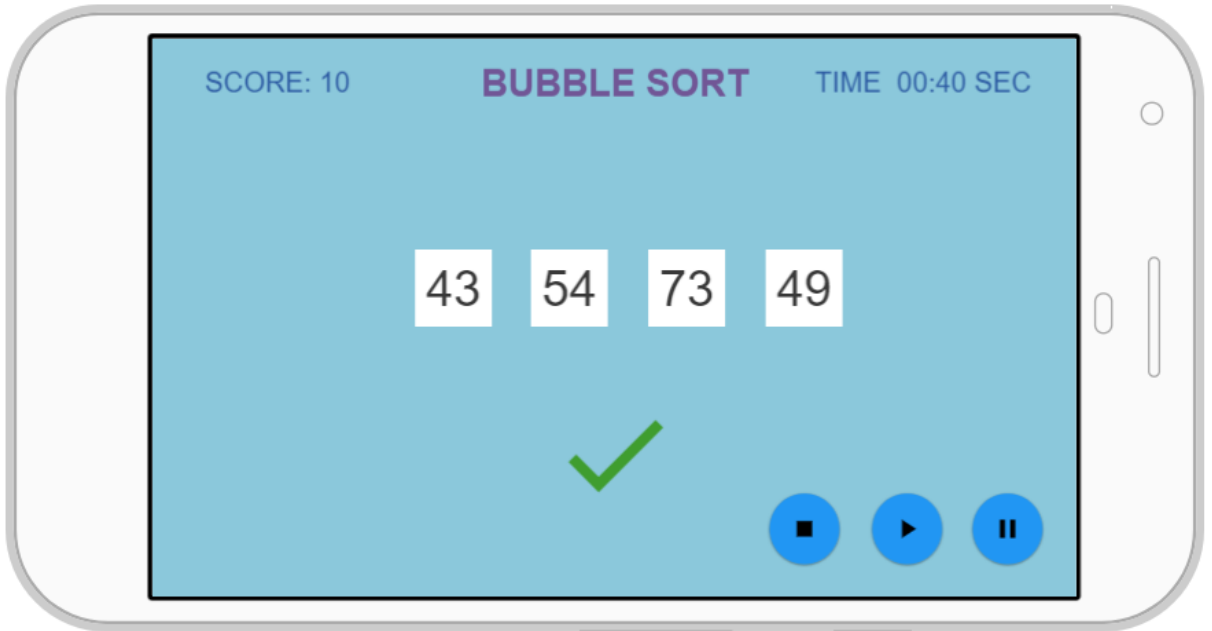
1) The user has to select a number present in the array by tapping it.(result: the number is selected.)



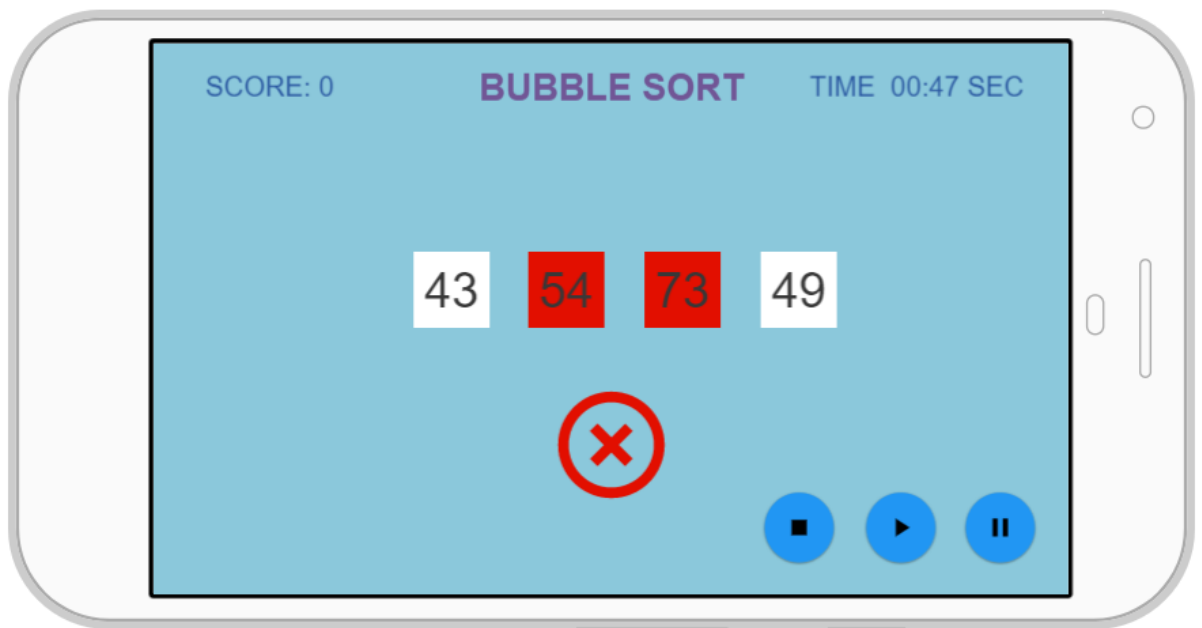
2) Next the user has to select another number to swap the previous number with. (result: the numbers are swapped.)



If the move is correct a green tick mark is shown.

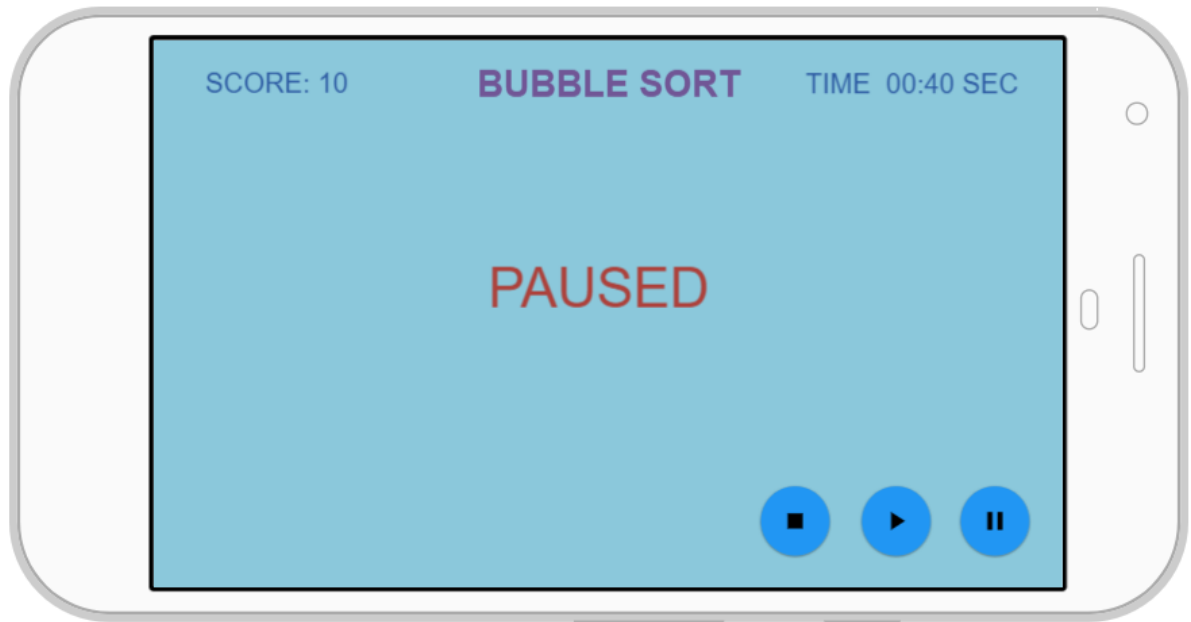


If the move is wrong a red cross mark is shown.



The user has to do the steps described above until the game completes.

3) The user can pause the game by pressing the pause button.(result: the game is paused. The numbers disappear.)



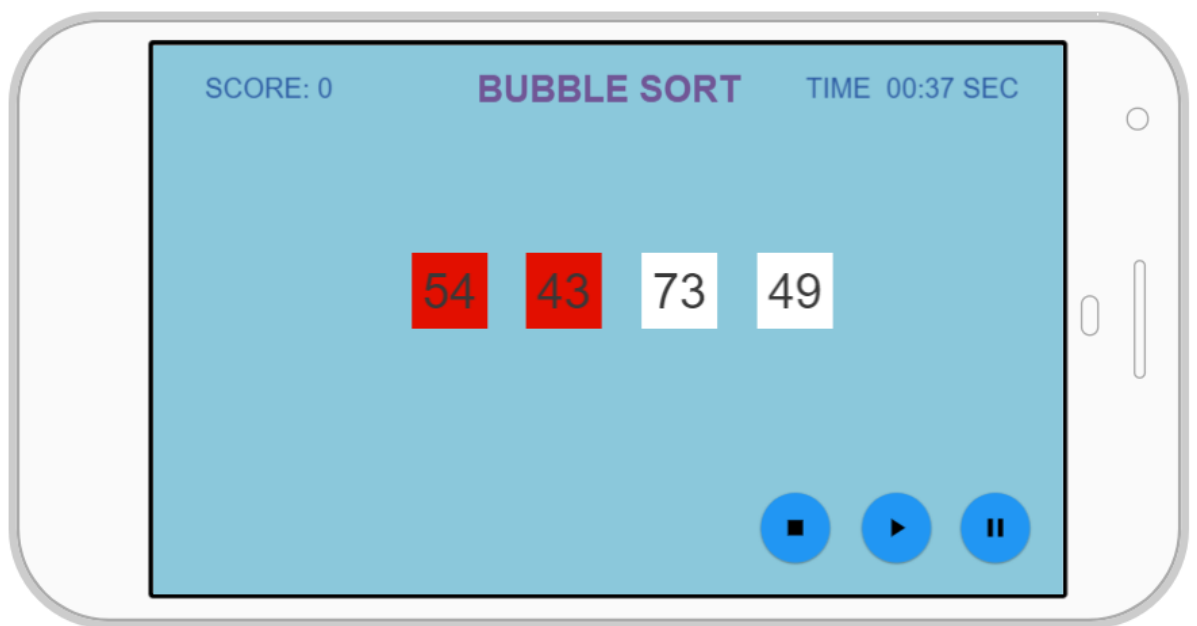
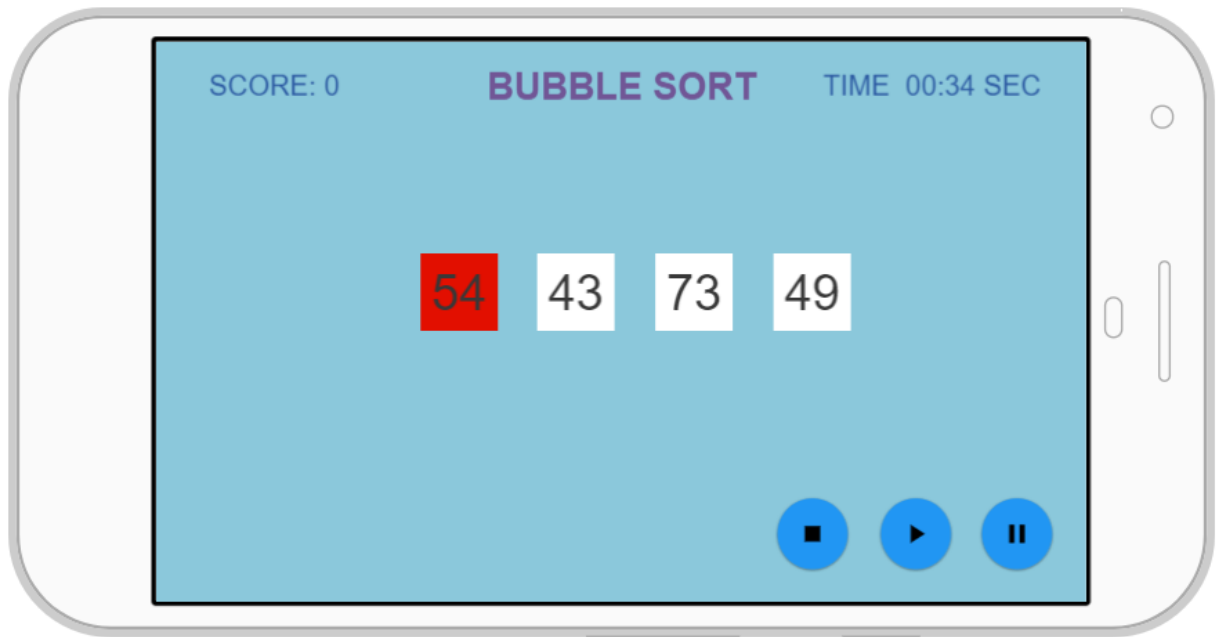
4) The user can resume game by pressing the resume button.(result: the game is resumed. The numbers reappear.)

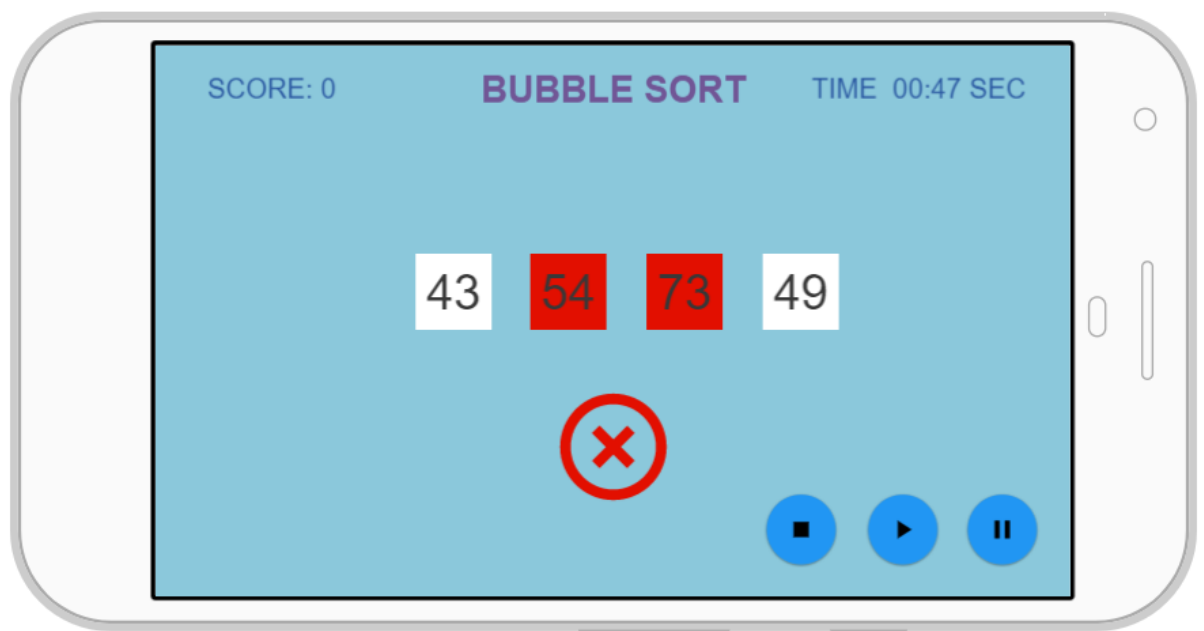
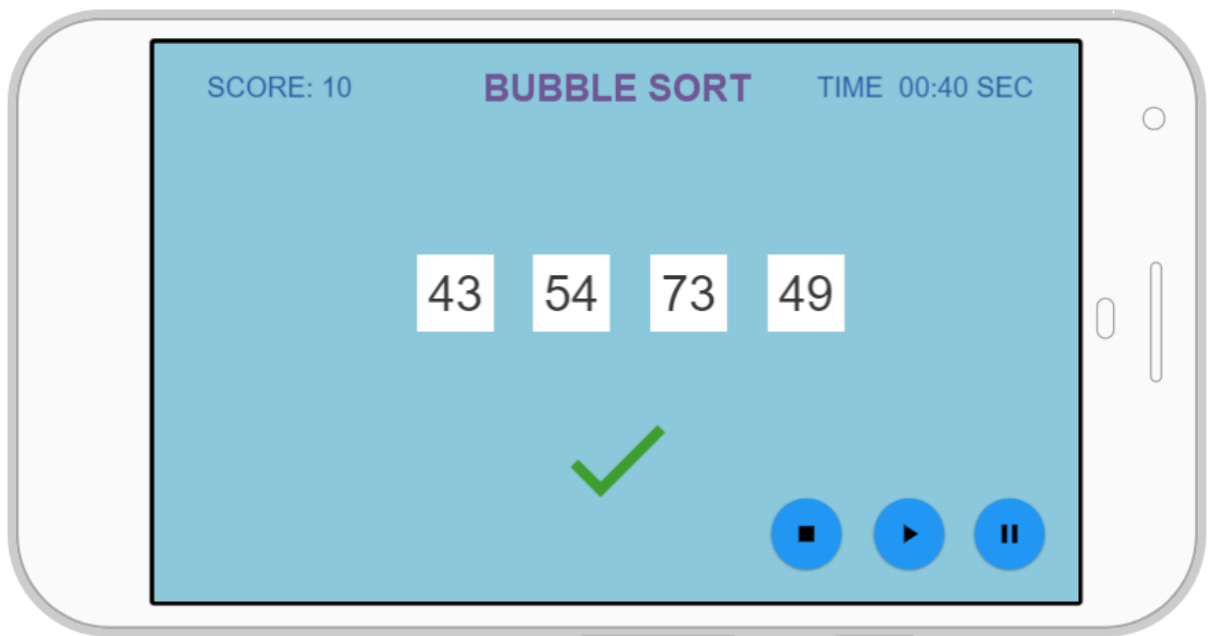
5) when the user makes three wrong moves, a window is displayed to make him/her restart the game. He has to click on the 'OK' button to restart the game.(result: the game is restarted.)

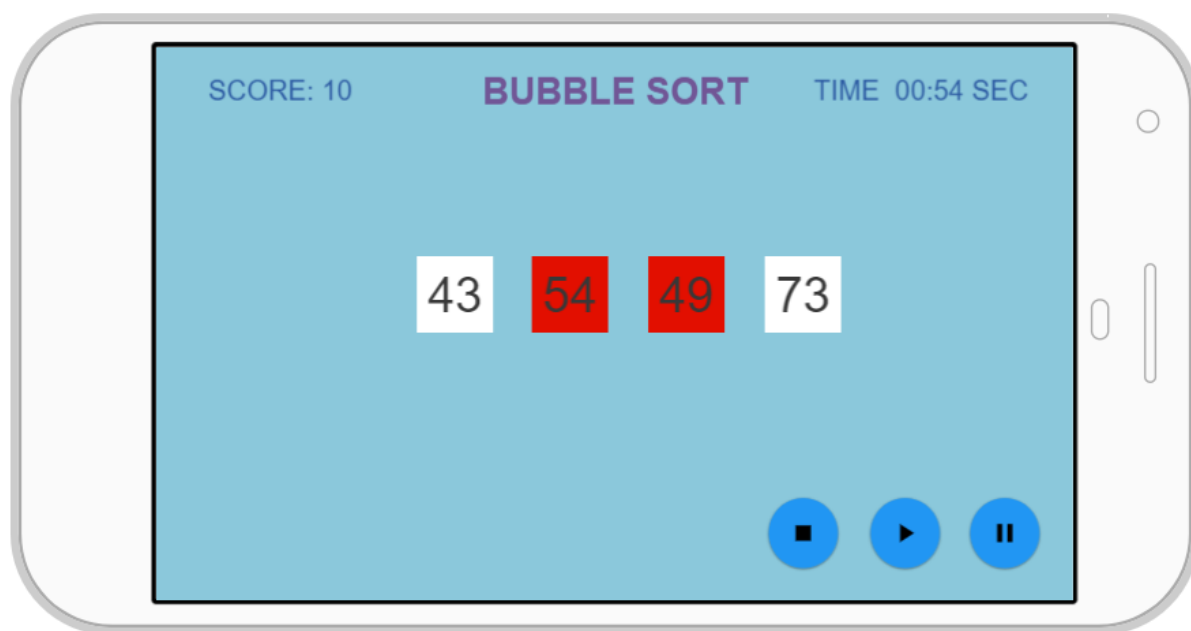
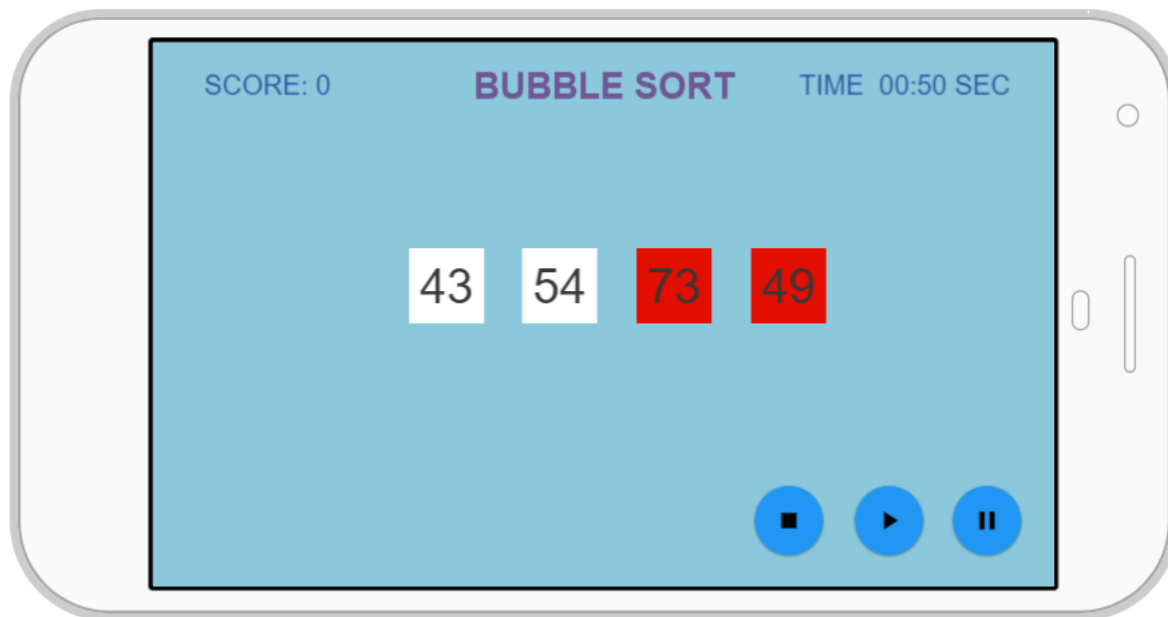
Playing the whole game is shown below for 4 number array(this is done

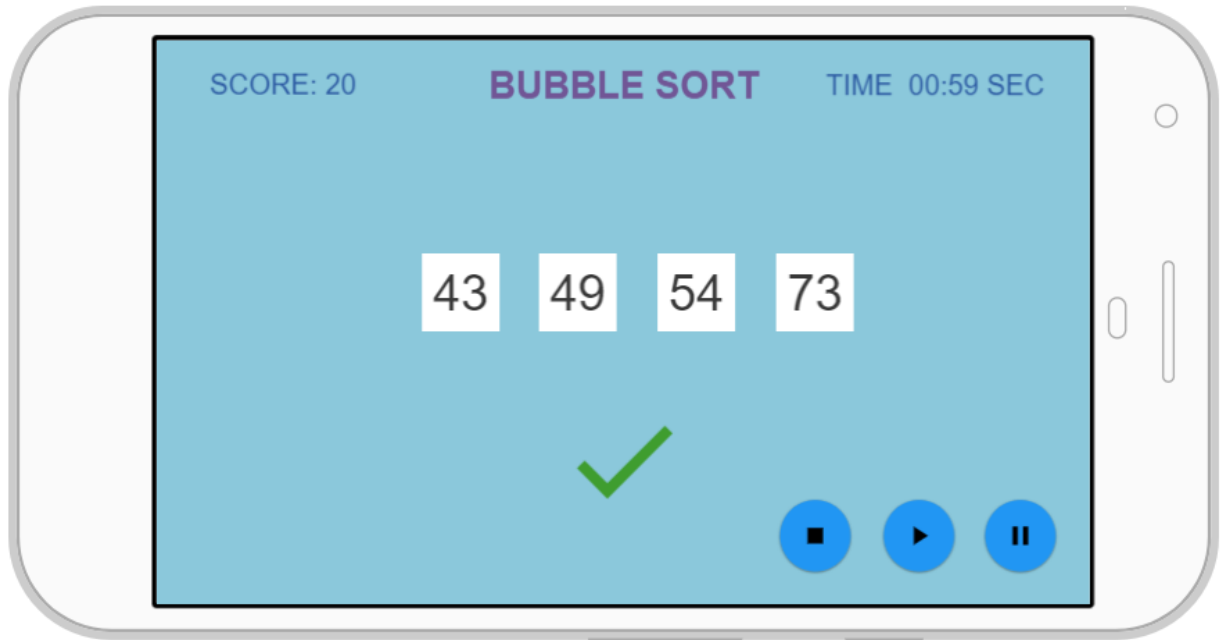


with 4 numbers to reduce the number of screenshots):









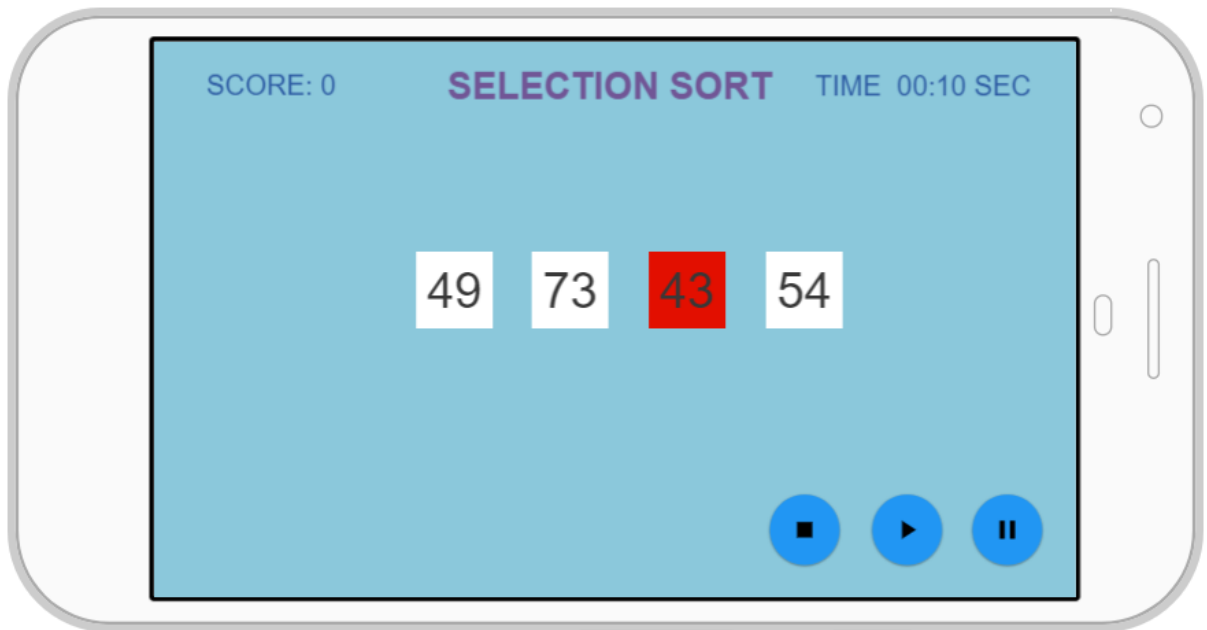
4. Play selection sort game:

Description: The user has to play the selection sort game by selecting two numbers and swapping them. He has to play the game until the game ends.

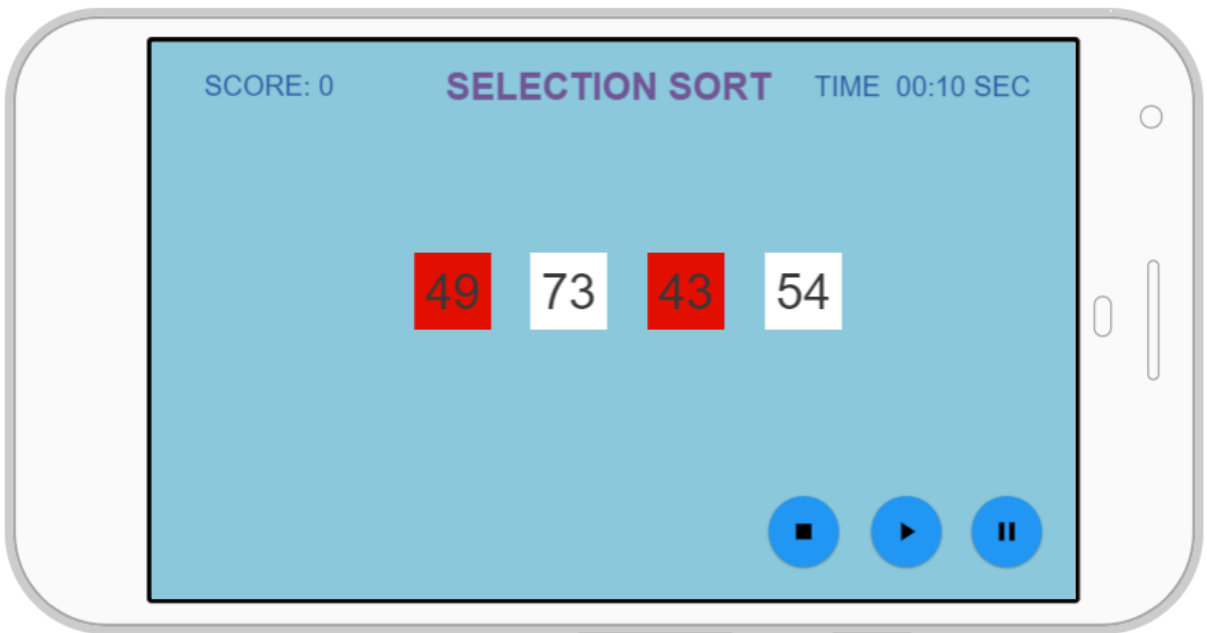
Action Sequence:

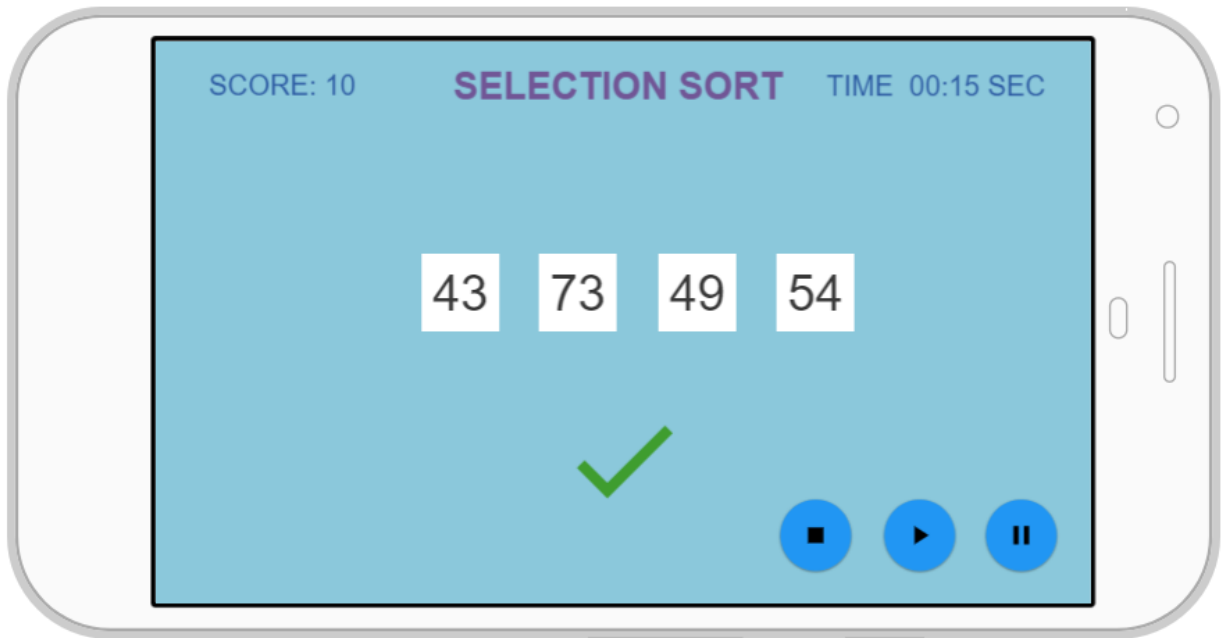
The screenshots in this task will be similar to those of bubble sort but with selection sort algorithm

1) The user has to select a minimum number present in the array by tapping it.(result: the number is selected.)

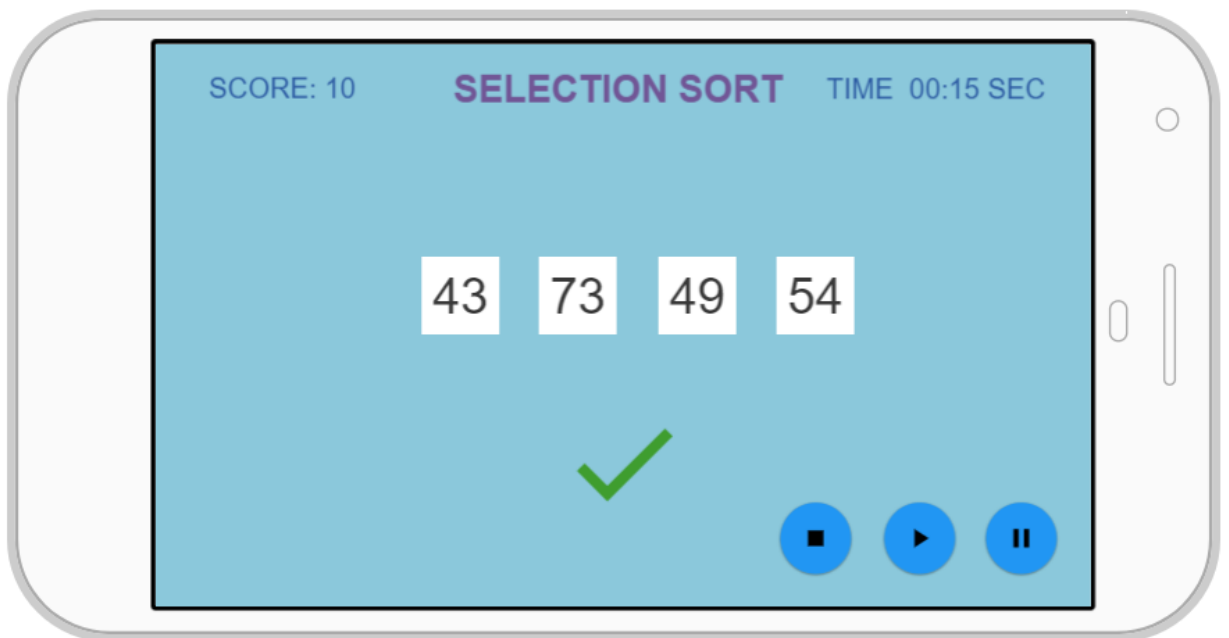


2) Next the user has to select another number at the place where he has to insert the previous number.(result: the number is inserted.)





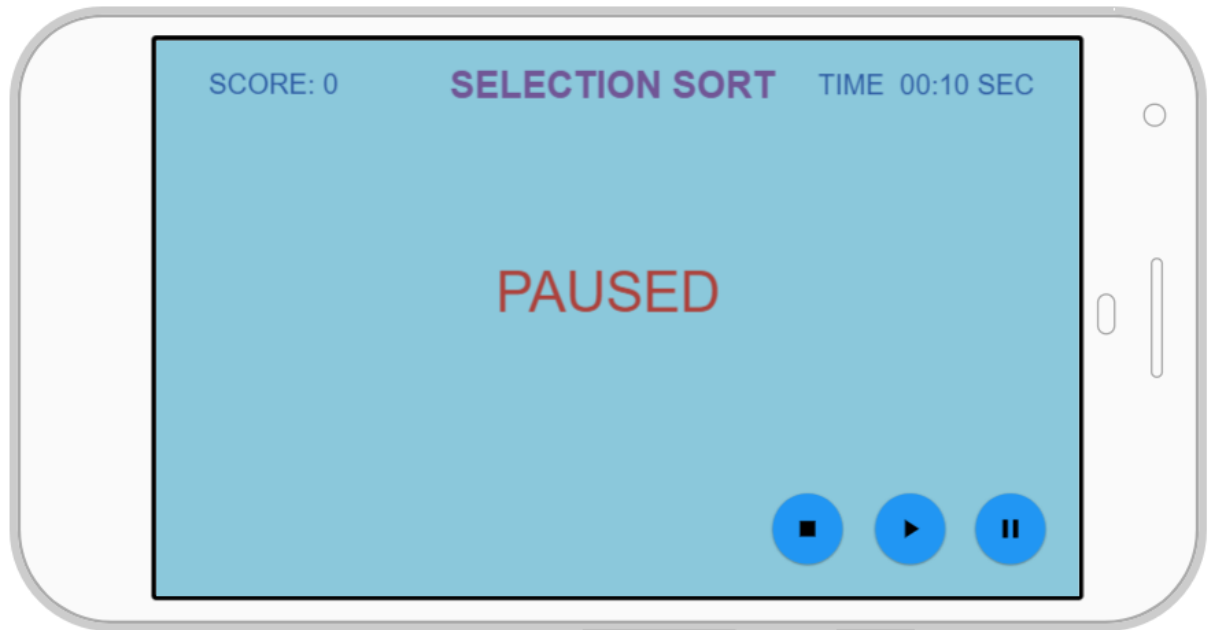
If the move is correct a green tick mark is shown.



If the move is wrong a red cross mark is shown.

The user has to do the steps described above until the game completes.

3) The user can pause the game by pressing the pause button.(result: the game is paused. The numbers disappear.)



4) The user can resume game by pressing the resume button.(result: the game is resumed. The numbers reappear.)

5) when the user makes three wrong moves, a window is displayed to make him restart the game. he/she has to click on the 'OK' button to restart the game.(restart: the game is restarted.)

5. Play insertion sort game:

Description: The user has to play the insertion sort game by selecting a number and inserting it. He has to play the game until the game ends.

Action Sequence:

The screenshots in this task will be similar to those of bubble sort but with insertion sort algorithm.

1) The user has to select a number present in the array by tapping it.(result: the number is selected.)

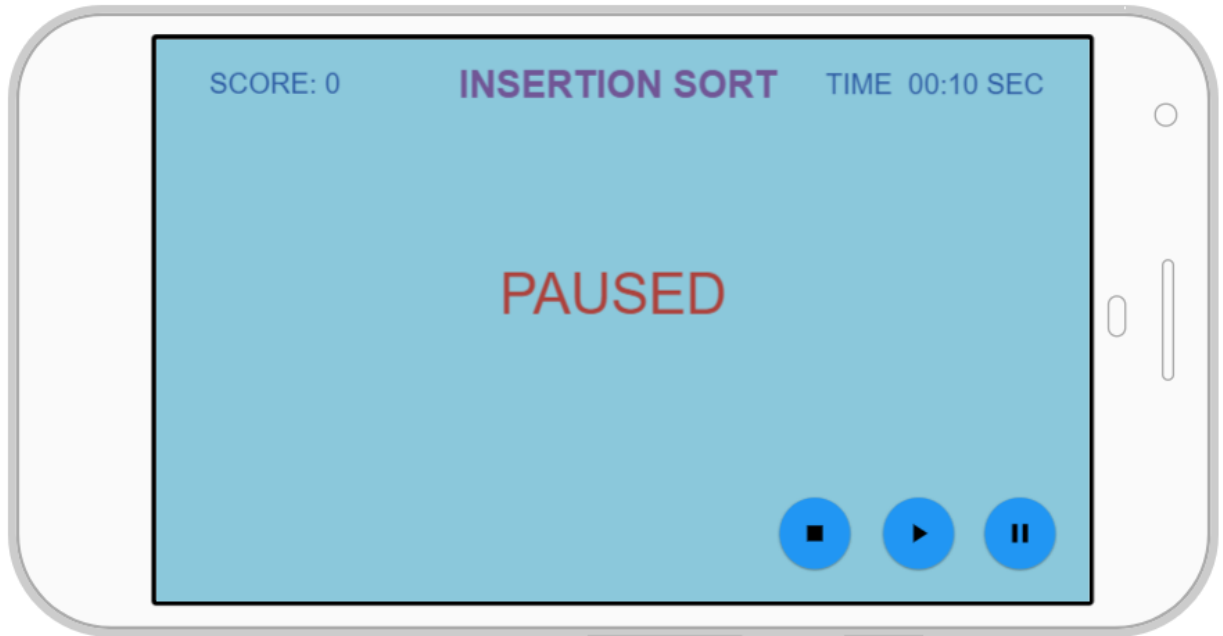
2) Next the user has to select another number at the place where he has to insert the previous number.(result: the number is inserted.)

If the move is correct a green tick mark is shown.

If the move is wrong a red cross mark is shown.

The user has to do the steps described above until the game completes.

3) The user can pause the game by pressing the pause button.(result: the game is paused. The numbers disappear.)



4) The user can resume game by pressing the resume button.(result: the game is resumed. The numbers reappear.)

5) when the user makes three wrong moves, a window is displayed to make him restart the game. he/she has to click on the 'OK' button to restart the game.(result: the game is restarted.)

#### 6. View game results:

Description: The user has to see the scores he has gained in the game and then go back to the main menu.

#### Action Sequence:

1) The user has to view the results of the game.





2) Then the user has to go back to the main menu by pressing the main menu button.



**Justification:** The tasks selected above are representative because all the tasks the app can do are covered in the tasks described above. The tasks described are exhaustive.

The app has three types of sorts that are covered in the above tasks.

All the options are covered in the covered tasks.

**Questionnaire:**

Following 5 questions were used as questionnaire.

1. Did the user try to achieve the end goal or did he give up at the start itself?
2. Did the user notice that the correct action choices are available? Yes-Partly-No
3. Did the user confidently know that the choice being made by him/her is the right one? Yes-No
4. Did the user understand the feedback after every action? Yes-No
5. Did the user Complete the Task with satisfaction? Yes-Partly-No

**Reports of individual team members:**

Each of the 6 tasks were assigned to all 3 types of team members.

Task1: Start game

Description Of the Step	Did the user try to achieve the end goal or did he give up at the start itself?	Did the user notice that the correct action choices are available?	Did the user confidently know that the choice being made by him/her is the right one?	Did the user understand the feedback after every action?	Did the user Complete the Task with satisfaction?	Remarks

Novice	Yes	Yes	Yes	No	No	Average
Intermediate	Yes	Yes	Yes	Yes	Yes	Good
Expert	Yes	Yes	Yes	Yes	Yes	Good

### Task2: View high scores

<b>Description Of the Step</b>	<b>Did the user try to achieve the end goal or did he give up at the start itself?</b>	<b>Did the user notice that the correct action choices are available?</b>	<b>Did the user confidently know that the choice being made by him/her is the right one?</b>	<b>Did the user understand the feedback after every action?</b>	<b>Did the user Complete the Task with satisfaction?</b>	<b>Remarks</b>
Novice	Yes	Yes	Yes	Yes	Yes	Good
Intermediate	Yes	Yes	Yes	Yes	Yes	Good
Expert	Yes	Yes	Yes	Yes	Yes	Good

### Task3: Play insertion sort game

<b>Description Of the Step</b>	<b>Did the user try to achieve the end goal or did he give up at the start itself?</b>	<b>Did the user notice that the correct action choices are available?</b>	<b>Did the user confidently know that the choice being made by him/her is the right one?</b>	<b>Did the user understand the feedback after every action?</b>	<b>Did the user Complete the Task with satisfaction?</b>	<b>Remarks</b>

Novice	Yes	Yes	No	No	No	Average
Intermediate	Yes	Yes	Yes	No	No	Average
Expert	Yes	Yes	Yes	Yes	No	Good

#### Task 4: Play selection sort game

<b>Description Of the Step</b>	<b>Did the user try to achieve the end goal or did he give up at the start itself?</b>	<b>Did the user notice that the correct action choices are available?</b>	<b>Did the user confidently know that the choice being made by him/her is the right one?</b>	<b>Did the user understand the feedback after every action?</b>	<b>Did the user Complete the Task with satisfaction?</b>	<b>Remarks</b>
Novice	No	Yes	No	No	No	Bad
Intermediate	Yes	Yes	No	Yes	Yes	Good
Expert	Yes	Yes	No	Yes	Yes	Good

#### Task5: Play bubble sort game

<b>Description Of the Step</b>	<b>Did the user try to achieve the end goal or did he give up at the start itself?</b>	<b>Did the user notice that the correct action choices are available?</b>	<b>Did the user confidently know that the choice being made by him/her is the right one?</b>	<b>Did the user understand the feedback after every action?</b>	<b>Did the user Complete the Task with satisfaction?</b>	<b>Remarks</b>

Novice	No	No	Yes	Yes	No	Average
Intermediate	No	Yes	Yes	Yes	No	Average
Expert	Yes	Yes	Yes	Yes	Yes	Good

#### Task6: View game results

<b>Description Of the Step</b>	<b>Did the user try to achieve the end goal or did he give up at the start itself?</b>	<b>Did the user notice that the correct action choices are available?</b>	<b>Did the user confidently know that the choice being made by him/her is the right one?</b>	<b>Did the user understand the feedback after every action?</b>	<b>Did the user Complete the Task with satisfaction?</b>	<b>Remarks</b>
Novice	Yes	Yes	Yes	Yes	Yes	Good
Intermediate	Yes	Yes	Yes	Yes	Yes	Good
Expert	Yes	Yes	Yes	Yes	Yes	Good

#### Conclusions and recommendations:

- Improving the swapping by showing animations.
- The touch interface should be improved to be more user-friendly.
- Sounds must be included to make the app more enjoyable.
- More instructions must be given to user other than the pseudo code.
- It should be possible to view pseudo codes from main menu.