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**CMSC 122 FINAL PROJECT**

**Algorithm**

**Data Structured Used:** Array

**Algorithm Used:**

Here is the general algorithm that I used in creating the Modified Sliding Puzzle Game:

*Algorithm Modified Sliding Puzzle Game*

Start

1 Set the moveCounter to 0.
2 Set the image icons needed
3 Set the necessary audios
4 Initialize the GUI
5 Initialize the array (valueHolder[]) that will contain the value of each tile.
6 Enter the game
7 Shuffle the puzzle
8 Check if the puzzle is solved (This is the time where the player switch the tile values to solve the puzzle and each move increases moveCounter by 1).
9 If the puzzle is solved, go to line 10 else go back to line 7
10 Declare the player as winner and display the total number of moves that they have taken to solve the puzzle

End

Here is the algorithm for switching the tile values:

*Algorithm Switching Tile Values ()*

Start

```
1   If the player clicks the first tile:
2       set temp = the valueHolder[0]
3       if  valueHolder[1] == 9
4           valueHolder[0] = valueHolder[1]
5           valueHolder[1] = temp
```

```
6                       moveCounter = moveCounter + 1
7                       update the images of the tiles based on valueHolder[]
8               else if  valueHolder[3] == 9
9                       valueHolder[0] = valueHolder[3]
10                      valueHolder[3] = temp
11                      moveCounter = moveCounter + 1
12                      update the images of the tiles based on valueHolder[]
13      If the player clicks the second tile:
14              set temp = the valueHolder[1]
15              if  valueHolder[0] == 9:
16                      valueHolder[1] = valueHolder[0]
17                      valueHolder[2] = temp
18                      moveCounter = moveCounter + 1
19                      update the images of the tiles based on valueHolder[]
20              else if  valueHolder[2] == 9:
21                      valueHolder[1] = valueHolder[2]
22                      valueHolder[2] = temp
23                      moveCounter = moveCounter + 1
24                      update the images of the tiles based on valueHolder[]
25              else if  valueHolder[4] == 9:
26                      valueHolder[1] = valueHolder[4]
27                      valueHolder[4] = temp
28                      moveCounter = moveCounter + 1
29                      update the images of the tiles based on valueHolder[]
30      If the player clicks the third tile:
31              set temp = the valueHolder[2]
32              if  valueHolder[1] == 9:
33                      valueHolder[2] = valueHolder[1]
34                      valueHolder[1] = temp
35                      moveCounter = moveCounter + 1
36                      update the images of the tiles based on valueHolder[]
37              else if  valueHolder[5] == 9:
38                      valueHolder[2] = valueHolder[5]
39                      valueHolder[5] = temp
```

```
40                      moveCounter = moveCounter + 1
41                      update the images of the tiles based on valueHolder[]
42      If the player clicks the fourth tile:
43              set temp = the valueHolder[3]
44              if  valueHolder[0] == 9:
45                      valueHolder[3] = valueHolder[0]
46                      valueHolder[0] = temp
47                      moveCounter = moveCounter + 1
48                      update the images of the tiles based on valueHolder[]
49              else if  valueHolder[4] == 9:
50                      valueHolder[3] = valueHolder[4]
51                      valueHolder[4] = temp
52                      moveCounter = moveCounter + 1
53                      update the images of the tiles based on valueHolder[]
54              else if  valueHolder[6] == 9:
55                      valueHolder[3] = valueHolder[6]
56                      valueHolder[6] = temp
57                      moveCounter = moveCounter + 1
58                      update the images of the tiles based on valueHolder[]
59      If the player clicks the fifth tile:
60              set temp = the valueHolder[4]
61              if  valueHolder[3] == 9:
62                      valueHolder[4] = valueHolder[3]
63                      valueHolder[3] = temp
64                      moveCounter = moveCounter + 1
65                      update the images of the tiles based on valueHolder[]
66              else if  valueHolder[1] == 9:
67                      valueHolder[4] = valueHolder[1]
68                      valueHolder[1] = temp
69                      moveCounter = moveCounter + 1
70                      update the images of the tiles based on valueHolder[]
71              else if  valueHolder[5] == 9:
72                      valueHolder[4] = valueHolder[5]
73                      valueHolder[5] = temp
```

```
74                      moveCounter = moveCounter + 1
75                      update the images of the tiles based on valueHolder[]
76              else if  valueHolder[7] == 9:
77                      valueHolder[4] = valueHolder[7]
78                      valueHolder[7] = temp
79                      moveCounter = moveCounter + 1
80                      update the images of the tiles based on valueHolder[]
81      If the player clicks the sixth tile:
82              set temp = the valueHolder[5]
83              if  valueHolder[4] == 9:
84                      valueHolder[5] = valueHolder[4]
85                      valueHolder[4] = temp
86                      moveCounter = moveCounter + 1
87                      update the images of the tiles based on valueHolder[]
88              else if  valueHolder[2] == 9:
89                      valueHolder[5] = valueHolder[2]
90                      valueHolder[2] = temp
91                      moveCounter = moveCounter + 1
92                      update the images of the tiles based on valueHolder[]
93              else if  valueHolder[8] == 9:
94                      valueHolder[5] = valueHolder[8]
95                      valueHolder[8] = temp
96                      moveCounter = moveCounter + 1
97                      update the images of the tiles based on valueHolder[]
98      If the player clicks the seventh tile:
99              set temp = the valueHolder[6]
100             if  valueHolder[3] == 9:
101                     valueHolder[6] = valueHolder[3]
102                     valueHolder[3] = temp
103                     moveCounter = moveCounter + 1
104                     update the images of the tiles based on valueHolder[]
105             else if  valueHolder[7] == 9:
106                     valueHolder[6] = valueHolder[7]
107                     valueHolder[7] = temp
```

```
108                     moveCounter = moveCounter + 1
109                     update the images of the tiles based on valueHolder[]
110     If the player clicks the eighth tile:
111             set temp = the valueHolder[7]
112             if  valueHolder[6] == 9:
113                     valueHolder[6] = valueHolder[3]
114                     valueHolder[3] = temp
115                     moveCounter = moveCounter + 1
116                     update the images of the tiles based on valueHolder[]
117             else if  valueHolder[4] == 9:
118                     valueHolder[6] = valueHolder[7]
119                     valueHolder[7] = temp
120                     moveCounter = moveCounter + 1
121                     update the images of the tiles based on valueHolder[]
122             else if  valueHolder[8] == 9:
123                     valueHolder[7] = valueHolder[8]
124                     valueHolder[8] = temp
125                     moveCounter = moveCounter + 1
126                     update the images of the tiles based on valueHolder[]
127     If the player clicks the ninth tile:
128             set temp = the valueHolder[8]
129             if  valueHolder[7] == 9:
130                     valueHolder[8] = valueHolder[7]
131                     valueHolder[7] = temp
132                     moveCounter = moveCounter + 1
133                     update the images of the tiles based on valueHolder[]
134             else if  valueHolder[5] == 9:
135                     valueHolder[8] = valueHolder[5]
136                     valueHolder[5] = temp
137                     moveCounter = moveCounter + 1
138                     update the images of the tiles based on valueHolder[]
End
```

Here is the algorithm for shuffling the valueHolder array:

*Algorithm shuffle ()*

Start

```
1       while i<the length of the valueHolder[]:
2               set integer s = i +  (Math.random*valueHolder's length - i)
3               set integer temp = valueHolder[s]
4               valueHolder[i] = temp
```

End