

Puzzle App II

CSE 120 Winter 2018

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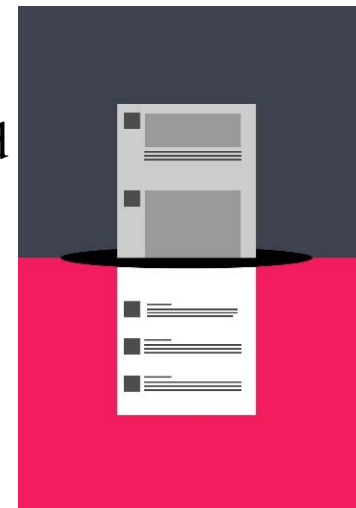
Eugene Oh,
Teagan Horkan

HOW TO TAKE BACK YOUR FACEBOOK NEWS FEED

“It also occurred to me that the social network—more so than platforms like Instagram and Twitter—gives its users significant control over what they see in the News Feed, including several levers I’d never bothered to pull. So rather than quit outright, I decided to conduct an experiment.

“Over the course of about 10 days, I used Facebook’s built-in features—as well as several third-party tools—to see if I could make the platform fun and ‘meaningful’ again. Some of it worked, but a lot of it didn’t. Mostly it was a reminder that you have more power over your News Feed than Facebook often lets on—for better or worse.”

- <https://www.wired.com/story/take-back-your-facebook-news-feed/>



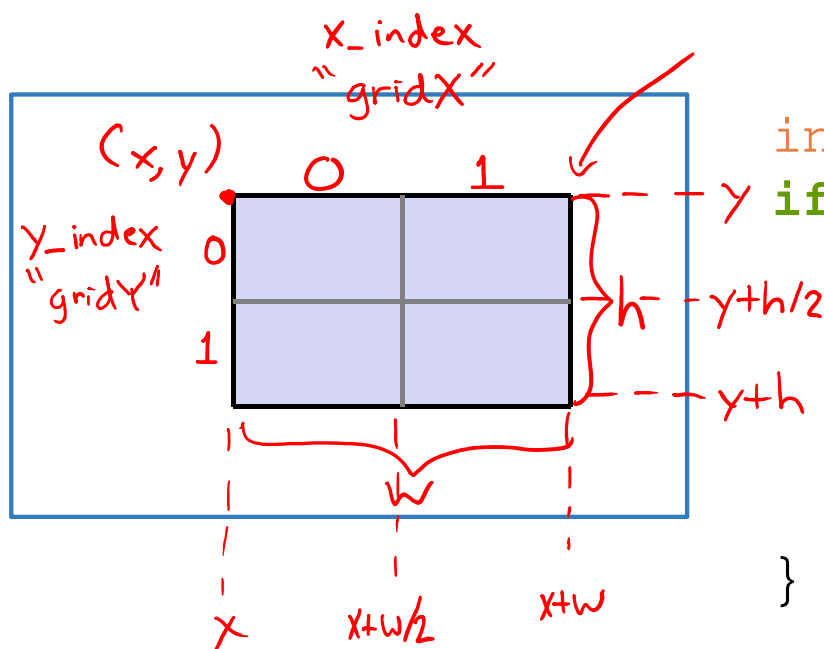
Administrivia

- ❖ Assignments:
 - Reading Check 6 due before lab tomorrow (2/15)
 - Word Guessing due Friday (2/16)
 - Birthday Visualization due Tuesday (2/20)
 - Living Computers Museum Report due Tuesday (2/20)

- ❖ “Big Ideas” lecture: Artificial Intelligence

Birthday Visualization

- ❖ Data visualization for birthday frequencies
 - Learn how to read file data into Processing
 - Use color to visualize numbers
 - Detection of mouse location within a *grid*



```
int x_index, y_index;
if( (mouseX >= x)      &&
    (mouseX <= x + w)  &&
    (mouseY >= y)      &&
    (mouseY <= y + h) ) {
    x_index = int((mouseX-x)/(w/2));
    y_index = int((mouseY-y)/(h/2));
}
```

↑ round down to an integer (drop fractional part)

Outline

- ❖ **15 Puzzle, continued**

Where We Left Off

- ❖ Implement game mechanics of sliding puzzle of numbered square tiles



- ❖ **Done:**
 - Draw reset button
 - Implement reset function
 - Draw game board (border and tiles)

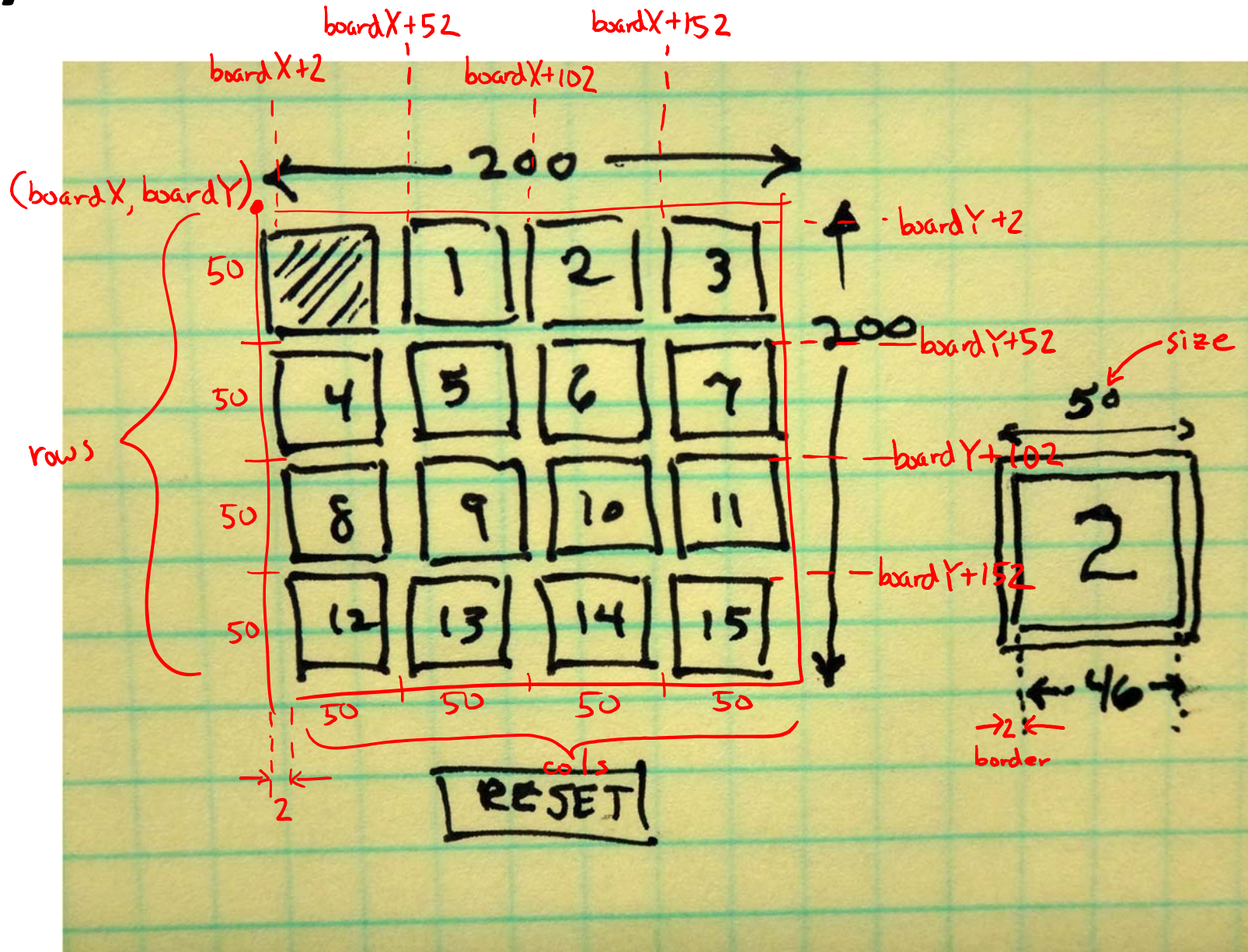
Where We Left Off

- ❖ Implement game mechanics of sliding puzzle of numbered square tiles

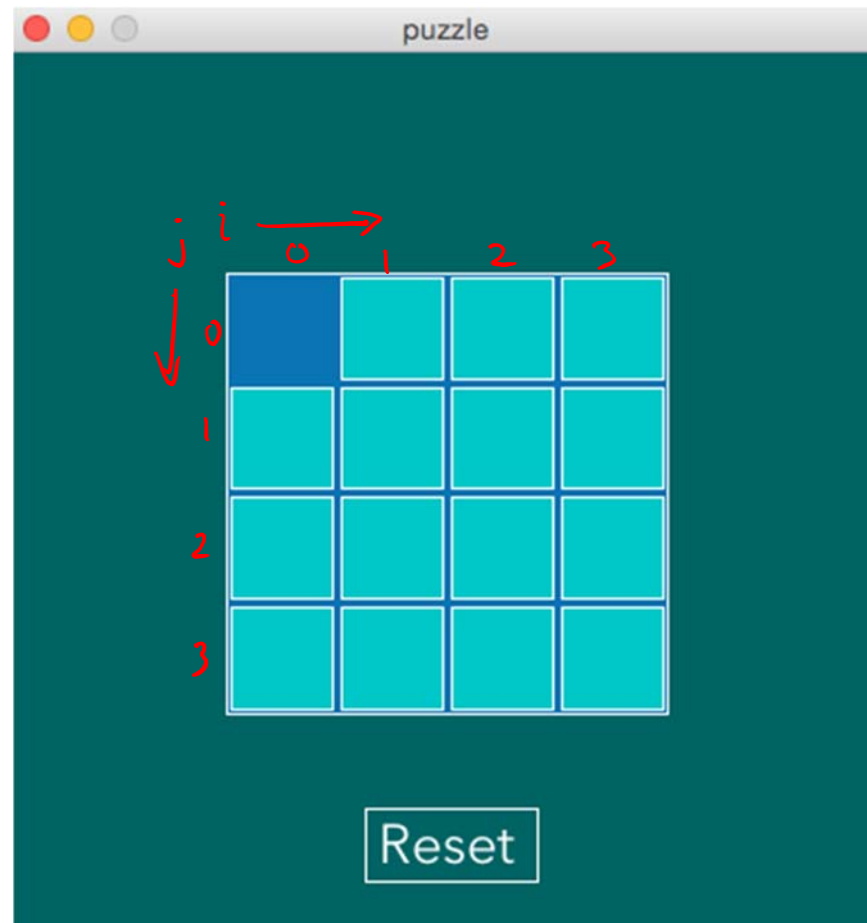


- ❖ **To Do:**
 - Implement board state and display numbers on tiles
 - Don't display tile with value 0 (empty/open)
 - Detect clicks on reset button and on grid
 - Determine if click is adjacent to open square
 - Can only be in up/down/left/right directions
 - Implement "sliding" (swap function)
 - [if time] Extra functionality!

Layout Reminder



Create the Tile Layout



nested for-loops!
loop variable i will
indicate column
loop variable j will
indicate row

Add Numbers to Tiles

state of board: `int[] tiles = new int[rows * cols];`

`text(tiles[0], boardX+size/2, boardY+size)`

`(boardX, boardY)`

`cols (i)`

`rows (j)`

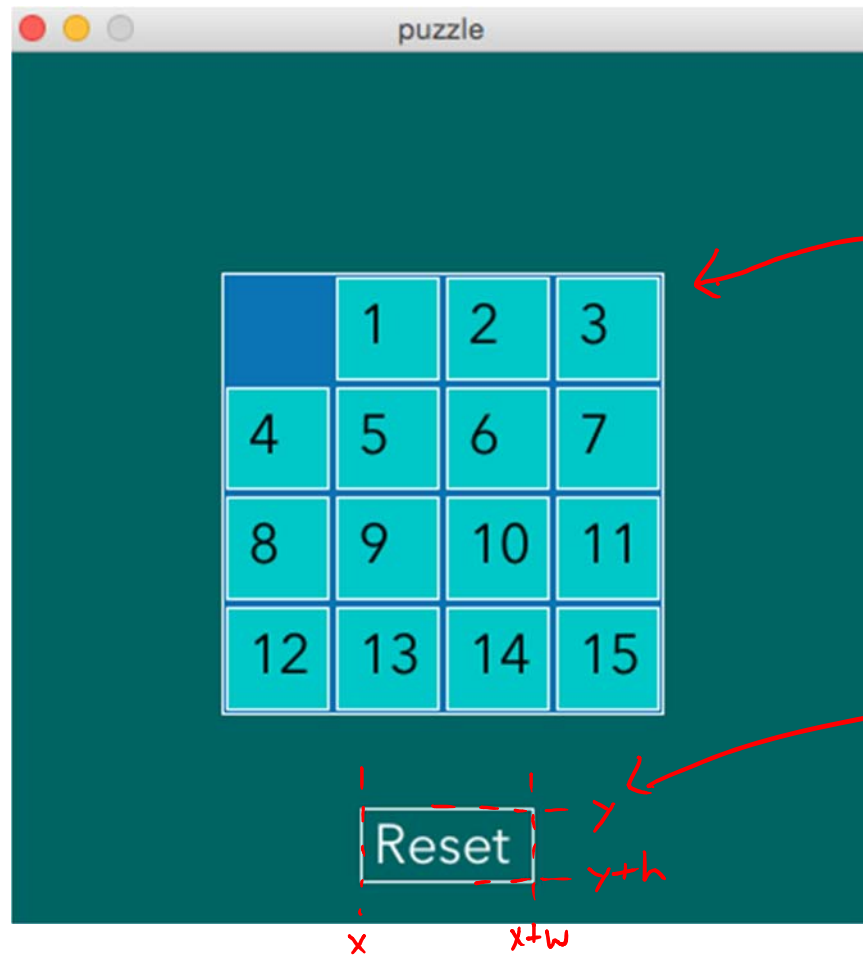
Reset

<code>i</code>	<code>j</code>	array index
0	0	0
1	0	1
2	0	2
3	0	3
0	1	4
1	1	5
2	1	6
...
2	3	14
3	3	15

$$\text{index} = i + j * 4$$

`cols` ↗

Reset Functionality



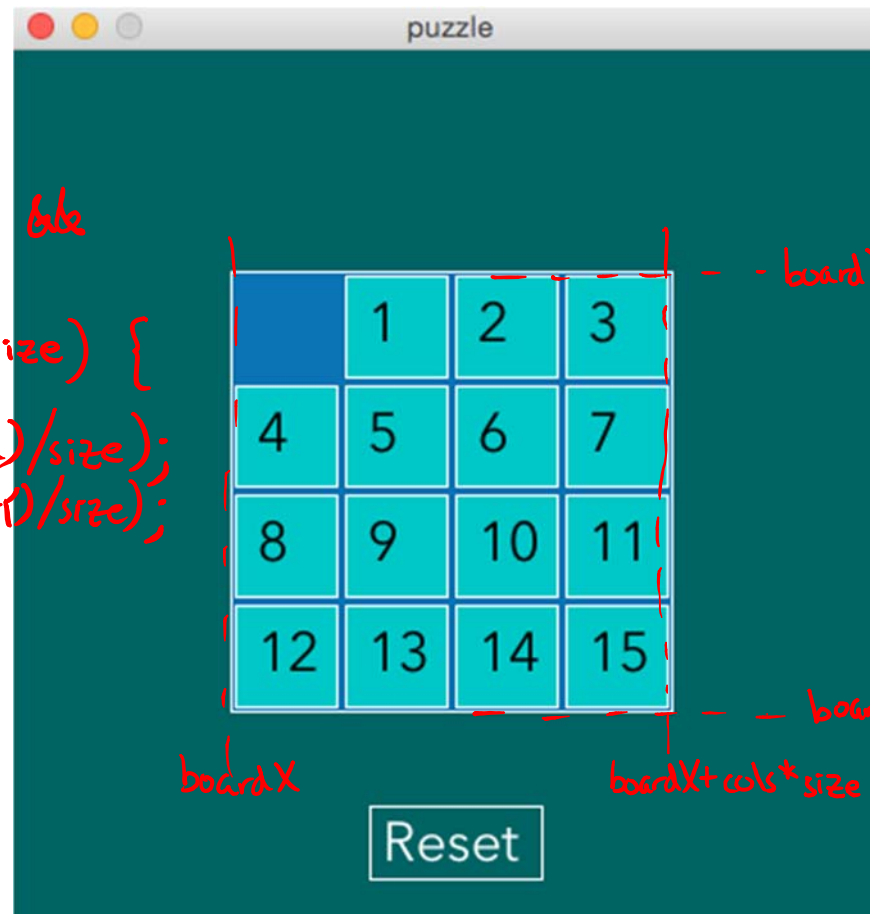
some loop variable
`tiles[k] = k;`

`if (mouseX > x &&
 mouseX < x+w &&
 mouseY > y &&
 mouseY < y+h)`

Tile Grid Click Detection

```

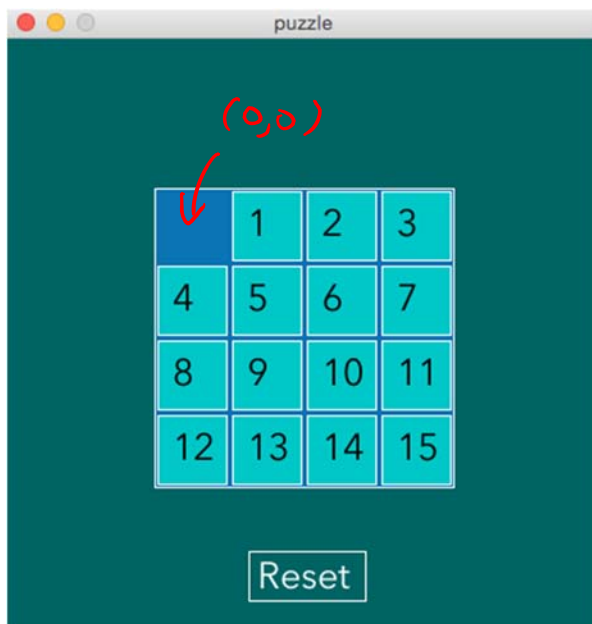
if (mouseX > boardX &&
    mouseX < boardX + cols * size &&
    mouseY > boardY &&
    mouseY < boardY + rows * size) {
    gridX = int((mouseX - boardX) / size);
    gridY = int((mouseY - boardY) / size);
}
    
```



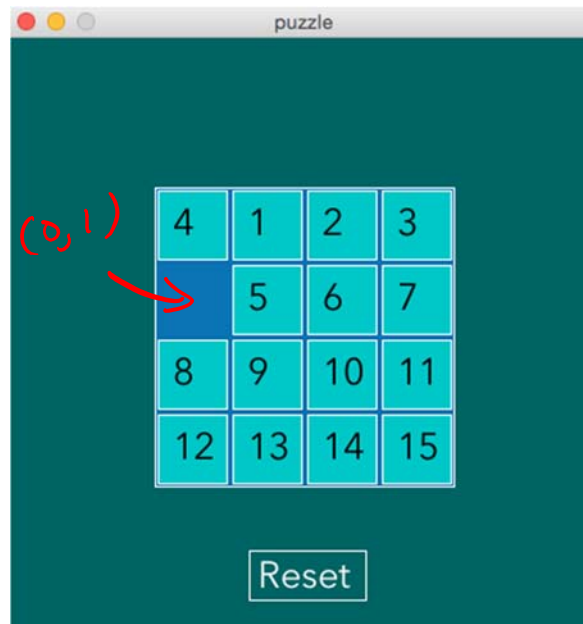
Tile Movements

swap {

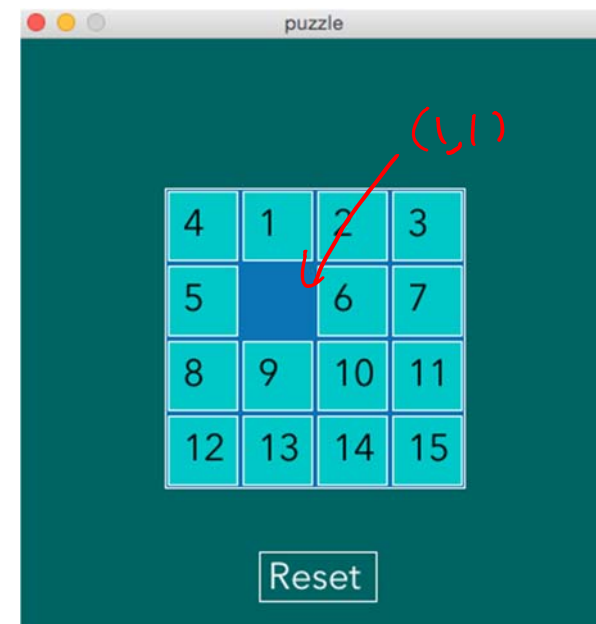
```
int temp = a;
a = b;
b = temp;
```



neighbors: (0,1)
(1,0)



neighbors: (0,0)
(1,1)
(0,2)



neighbors: (1,0)
(0,1)
(1,2)
(2,1)

① create variables to store current open tile grid coordinates (openX, openY)

② check if neighbor using: $abs(openX - gridX)$
 $abs(openY - gridY)$

If Time: Extensions

- ❖ Change Reset button hover color
 - Create `overReset ()` function that returns a `boolean`
- ❖ Randomize initial tile placements
 - Tricky! How to avoid repeats?
- ❖ Check for win condition: tiles ordered 0-15
 - **Note:** This is not achievable for many randomized starting orderings

Summary

- ❖ Sketched the idea on paper
- ❖ Planned out coding representations
- ❖ Started with the things we knew how to do first
- ❖ Built on previous work by adding one function or idea at a time
- ❖ Ran the program after *every* improvement to make sure that it worked correctly
 - Unit and integration testing!!!