CSE 11

discussion 7

with

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btw, i have office hours Thu 5-6PM

I’m telling you this now on week 7 but better late than never
2048

• Play it and watch closely: https://gabrielecirulli.github.io/2048/

• When is a row/column allowed to move?

• How exactly do the numbers move in each row/column?
Can this column go down?

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>8</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>64</td>
<td>2</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Same as asking:
Can this row go left?

<p>| | | | |</p>
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</tr>
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</table>

So pretty much everything reduces to moving rows left…
(this is what `getRow` does)
Moving stuff to the left which reminds me of that one Beyoncé song

```
0 2 2 8
```

transform does all of this
if you understand transform then everything else is gravy

```
4 8 0 0
```

Combine 2s, skip the first 0

```
0 2 0 4
```

“Collapse” into the zeros

```
2 4 0 0
```

```
4 4 4 4
```

Combine 2 equal numbers, but only once

```
8 8 0 0
```
Important 2048 functions

- **getRow**: turn pretty much everything into a row going left
- **transform**: Slide the row left, combining numbers and skipping zeros
- **shift**: A helper function for transform() to skip a bunch of zeros
- **checkRow**: Can the row go left?
Methods which cause failures (all in Board.java)

Arrow means “is used inside of”

getRow

\[\text{shift} \downarrow\]

transform

\[\text{checkRow} \downarrow\]

\[\text{canMove} \downarrow\]

move

So, start by fixing the methods that don’t call anything else
Then work your way down
The Bigger Picture of HW7

- **move** uses **transform** which uses **shift**

- What if you only had a failing test for **move**? How would you know where the bug is?

- You want to test the smallest parts of a program that you can

- Someone decided to call these **units**

- Hence, **unit testing**, not just testing
Questions
Various cat gifs which you can only see if you went to section

(doesn't work in the pdf version 😐)