- PA 6: Next 1 last day
- PA 7: Will be posted soon
- Quiz 4: Wed. 11-18-15

- EMS 11: (1) Wait lists start Nov. 16
  (2) Consider taking EMS 12A/L
  (3) CS11 also offered in Spring.
Chapter 9: Arrays

Recall a class encapsulates data and functions.

class Blah {
    // fields
    int foo;
    float bar;
    // methods

    //
    Blah B = new Blah(...);
    B.foo = 6;
    B.bar = 7.0;
}
An array holds data all of the same type.
Ex: `int[] A = new int[5];`

Array indices:

```
```

The array elements are referred to by:

```
```

In Java (i.e., Processing) arrays know how long they are (unlike C, C++).

The expression `A.length` evaluates to the length of `A`.
Ex: Array A

Valid array indices range from 0 to A.length - 1. Any attempt to reference indices outside this range is an error.

In particular:

A[A.length]

is never valid.

Any int expression can go in brackets

A[expression]
as long as

\[ 0 \leq \text{expression} \leq A\cdot \text{length} - 1 \]

\[
\text{Ex.}
\]

```java
int[i, j, k;
\]
\]
\]
\]
\]
```

A[i] = 5;
A[i + i] = 12;
A[i + i + k - i] = 20; // invalid. Since i + i + k is 6
```

\[
\text{Ex. Array 2:}
\]

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

A

2500
Ex. Array 3

\[ A \begin{array}{c}
0 \quad 1 \quad 2 \quad 3 \quad 4 \\
2 \quad 4 \\ x-1 \quad 8 \\ 10
\end{array} \]

\[ B \begin{array}{c}
0 \quad 1 \quad 2 \quad 3 \\
3 \quad 6 \\ 9 \\ 12 \quad 15
\end{array} \]

\[ C \begin{array}{c}
\text{after} \\
C = A \\
C[21] = -1
\end{array} \]

Ex. \( \text{int } x = 6 \)

\( \text{int } y ; \)

\( y = x ; \)

\( y = 7 ; \)
Ex. Snake say n = 100

Mouse x
for this frame

Update array

0 1 2 3

n-2 n-1

Head copy over old values tail

Ex. Car 7

Car [] C = new Car [3];

C

car references, no car objects yet
Clod = new Car(---);
Clid = new Car(---);
Clid = new Car(---);

Ex: Stripe Array