. Pas: next 1 day

Ex: Car A.

Java (i.e., Processing) allows us to treat things (like cars) as self-contained objects.
The program construct that allows this is the class.
using it we can bundle

1) The variables that constitute a car object

\[
\begin{align*}
\text{xpos} & \quad \text{member variables} \\
\text{ypos} & \quad \text{or} \\
\text{speed} & \quad \text{fields} \\
\end{align*}
\]

and

2) the things that a car does

\[
\begin{align*}
\text{displayCar()} & \quad \text{member methods} \\
\text{moveCar()} & \quad \text{or} \\
\end{align*}
\]

must write a car class.
class definition looks like:

class Blah {
    // fields
    // methods
}

"Blah" is then a new data type. We can declare variables of new type.

Blah Blah
To create a Blah object
use new operator.

\[ B = \text{new Blah}() \]

can do both at once

Blah B = new Blah();

Ex. Car2

member selection operator:

\[ . \ (dot) \]
we use member selection to access fields:

B.field1 = value1;
B.field2 = value2;

and to call methods:

B.method1(...);
B.method2(...);

Note: member selection() is used outside the class definition, inside, just use member name.
Every class has a special method called a **constructor** whose name is the same as the name of the class.

```
Blah()
```

*Note:* it has no return value, not even `void`. It is only called by `new` and tells `new` how much memory to allocate.
A constructor can be defined to initialize field values.

Ex: Cars

Recall here & primitive data types in Java

- byte
- short
- int
- long
- float
- double
- boolean

char ← also numeric
Processing adds one more primitive type:

color

can also think of this as numeric.

Ex. Color 1

Hexadecimal: base 16

digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, f

\[
(cad)_{16} = 6 \cdot 16^2 + a \cdot 16^1 + d \cdot 16^0
\]

\[
= 1709_{10}
\]
Recall there are two kinds of data types:

- Primitive types (above)
- Reference types (all others)

What you create with a class definition.

Thus Car is a reference type, also have a reference type called String.

Ex. String1