PICK UP HANDOUT.

GET YER CLICKERS READY !!

Code Layout, Inheritance & Interfaces

The goal of code layout/formatting is to show logical structure

Good layout is shows intention, is consistent, improves readability, and withstands modification.

Which is best?

```
A)     for(int i=0;i<str.length();i++){
B)     for (int i=0; i<str.length(); i++) {
C)     for (int i = 0; i < str.length(); i++) {
D)     for (int i = 0 ; i < str.length() ; i ++) {
E)     for( int i = 0 ; i < str.length() ; i ++ ){
```

Which is better?

A) `for (int i = 0; i < args.length; i++)`

B)
```
for (int i = 0;
     i < args.length;
     i++)
```

C) Both are fine

D) Both are lacking

Which is better?

A) `if (game[i][index] != c)`

B) `if ( game[ i ][ index ] != c )`

C) Both are fine

D) Both are lacking

Which is better?

A) `char [][] game = new char[3][3];`

B) `char [][] game = new char[ 3 ][ 3 ];`

C) Both are fine

D) Both are lacking

Hmmm…

- I like spacing operands like the following:

```
int x = a + b + c + d + 17;
```

- But in the below, I personally prefer the second option:

```
data[i][i] = data[i - 1][i - 1];
data[i][i] = data[i-1][i-1];
```

~~data[a + b + c + d + e + f]~~

int index = a + b + ... ;
data[index]

Are you familiar with the $\overset{3}{\underline{\text{ternary}}}$ operator?

```
if (a) {
   x = b;
} else {
   x = c;
}
```

$$x = \overset{\text{condition}}{a} \; ? \; \underbrace{b}_{\text{if condition true}} : \underbrace{c}_{\text{if condition is false}} ;$$

What is wrong with this?

```
int foo = (a + b == 10) ? c : (d + e);
```

Which is better?

foo() {
~~int p.....;~~

A) `int parenthesis;`
`parenthesis = 0;`

B) `int parenthesis = 0;`

int parenthesis = 1

C) Both are fine

D) Both are lacking

int parenthesis = 0;

for (...) {
    int parenthesis =
}
..... parenthesis.

Which is better?

A)
```
int paren = 0, eqnLength = eqn.legnth();
```

B)
```
int paren = 0;
int eqnLength = eqn.legnth();
```

C) Both are fine

D) Both are lacking

What is wrong with this?

```
aFunction(j, k); j++; k++;
```

Which is better?

A)

```
if (three) {
    System.out.println("Valid: " + value);
}
~~i++;~~
else {
    System.out.println("Invalid");
}
```

B)

```
if (three) {
    System.out.println("Valid: " + value);
} else {
    System.out.println("Invalid");
}
```

C) Both are fine D) Both are lacking

Which is better?

A)

```
if (three) {
    System.out.println("Valid");
} else {
    System.out.println("Invalid");
}
```

B)

```
if (three)
    System.out.println("Valid");
else
    i ++;
    System.out.println("Invalid");
```

C) Both are fine

D) Both are lacking

Which is best?

A)
```
if (prev_type==type&&type!=1&&type!=2) {
```
B)
```
if (prev_type == type && type != 1 && type != 2) {
```
C)
```
if ((prev_type == type) && (type != 1) && (type != 2)) {
```

D) All are fine

E) All are lacking

Inheritance

- **Super-type / Sub-type (extends in Java)**
  - **IsA** relationship; the sub-type isA version of super-type
- **Abstract:**
  - Cannot be instantiated, but describes the interface of what a given type can do.
- **Protected:**
  - Public to my sub-classes (transitively), private to others

Casting in Java

- **What if you have an object$_{\wedge}^{\text{reference}}$ in a super type and you want to access its sub-type only functionality?**

- **If you _know_ what the sub-type is, just cast it:**
  - SuperType x = new SubType();
  - SubType xAsSubType = (SubType)x; // will except if wrong

- **If you aren't sure, then ask: instanceof**
  - if (x instanceof SubType) {
  -     then cast

char c;

"blah" + c

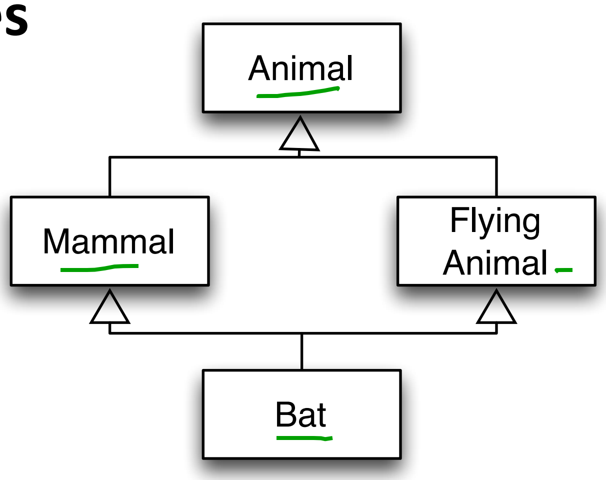
"blah" + c.toString()

How does it work?

- See scribble along with handout / watch the video

Interfaces vs. Abstract Base Classes

- **Java objects can only extend one other class**
  - "single inheritance"
- **Sometimes logical inheritance hierarchies aren't trees**



- **Java provide Interfaces**
  - You can 'implement' any number of interfaces
  - List and Map are interfaces, while ArrayList and HashMap are classes

```
List<String> list = new ArrayList<>();
```