

# ICS 141

# Programming with Objects

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# What is an iterator?

- *“Provide a way to access the elements of an aggregate object sequentially without exposing its underlying representation”*

– GoF



# The Iterator Interface

<b>Iterator&lt;T&gt;</b>
+ hasNext () : boolean + next () : T

<https://docs.oracle.com/javase/8/docs/api/java/util/Iterator.html>

# Using an Iterator

```
import java.util.Iterator;

SomeCollectionClass<T> collection = new
SomeCollectionClass<T>();
// Assume some items have been added to collection

// Instantiate the iterator
Iterator<T> itr = collection.iterator();

while (itr.hasNext()) {    // Is there another element?
    // Retrieve and display next item in the list
    System.out.println(itr.next());
}
**How do we know that SomeCollectionClass has an iterator?4
```

# The Iterable Interface

<b>Iterable&lt;T&gt;</b>
+ iterator () : Iterator<T>

<https://docs.oracle.com/javase/8/docs/api/java/lang/Iterable.html>



# Try it!

- Implement the Iterable interface for the AnimalShelter class.
- What type of data will this interface use (in other words – what are you putting inside the angle brackets?)
- Remember to create a private class in the same file that extends iterator.

A for loop designed for  
iterable collections!

for each



Enhanced for loop (for each loop)

```
for (DataTypeOfCollection someVariable :  
collection){  
    System.out.println(someVariable);  
}
```



# Try it!

- In the driver class of the Animal Shelter project, use an enhanced for loop to print the animals in the animal shelter.