if-else Strings

What is an if else?

the if-else statement

```
if   I am tired
   I go to sleep
else
   I go for a run
```

If-else statements are just simple decision-making statements.

A condition is checked and something may or may not happen based on the evaluation of that condition.

the if-else statement

```
if   I like the current song
       I make it louder
else
       I change the song
```

If-else statements are just simple decision-making statements.

A condition is checked and something may or may not happen based on the evaluation of that condition.

the if-else statement

```
if( boolean condition placed here )
{
    do something 1;
}
else
{
    do something 2;
}
```

If the condition is true, `do something 1` will occur.

If the condition is false, `do something 2` will occur.

the if-else statement

```
int num=990;
if(num>100)
{
  System.out.println("> 100!");
}
else
{
  System.out.println("! > 100!");
}
```

OUTPUT

```
> 100!
```

If num is greater than 100, `>100!` is displayed.

If num is not greater than 100, `!>100!` is displayed.

the if-else statement

```
int num=50;
if(num>100)
{
  System.out.println("> 100!");
}
else
{
  System.out.println("! > 100!");
}
```

OUTPUT

```
! > 100!
```

If num is greater than 100, `>100!` is displayed.

If num is not greater than 100, `!>100!` is displayed.

the if-else statement

```
int num=100;
if(num>=100)
{
  System.out.println(">= 100!");
}
else
{
  System.out.println("! >= 100!");
}
```

OUTPUT

```
>= 100!
```

If num is greater than or equal to 100, `>=100!` is displayed.

If num is not greater than or equal to 100, `!>=100!` is displayed.

the if-else statement

```
int uilScore=200;
if(uilScore>190)
{
  System.out.println("team");
}
else
{
  System.out.println("bench");
}
```

OUTPUT

```
team
```

If uilScore is greater than 190, `team` is displayed.

If uilScore is not greater than 190, `bench` is displayed.

the if-else statement

```
String s = "one";
if(s.equals("one"))
{
  System.out.println(s + " is one!");
}
else
{
  System.out.println(s + " is not one!");
}
```

OUTPUT

```
one is one!
```

`s` is a String reference. `s` stores the location/address of a String Object.

The `equals()` method compares the contents of two String Objects to see if they contain the same letters in the same order in the same case.

If `s` contains the letters `one`, `one is one!` is displayed.

If `s` does not contain the letters `one`, `letters is not one!` is displayed.

open ifelse.java

open ifelsestring.java

nesting ifs

```
int num=1;
if(num>2)
{
  if(num<10)
    System.out.println(">2<10");
}
else{
  System.out.println("<2");
}
```

OUTPUT

<2

Nesting occurs when one thing is placed inside of another thing.

`if(num<10)` has been nested inside of `if(num>2)`

`if(num<10)` will only be tested if `if(num>2)` is true.

The else is associated with `if(num>2)`. Without the braces, the else would be associated with `if(num<10)` as if and else are paired based on proximity.

nesting ifs

```
int num=11;
if(num>2)
  if(num<10)
    System.out.println(">2<10");
else
  System.out.println("<2");
```

OUTPUT

```
<2
```

Always use braces with ifs to indicate which statements are related.

Nesting occurs when one thing is placed inside of another thing.

`if(num<10)` has been nested inside of `if(num>2)`

`if(num<10)` will only be tested if `if(num>2)` is true.

The else is associated with `if(num<10)`. If braces were present around `if(num<10)`, the else would be associated with `if(num>2)` as if and else are paired based on proximity.

open ifnesting.java danglingelse.java

common errors

```
if(total >= 25)
{
}
else(total = 10)
{
}
```

{ and ; rule

Never put a ;
before an open { brace

;{ **illegal**

}; **legal**


Start work
on the labs
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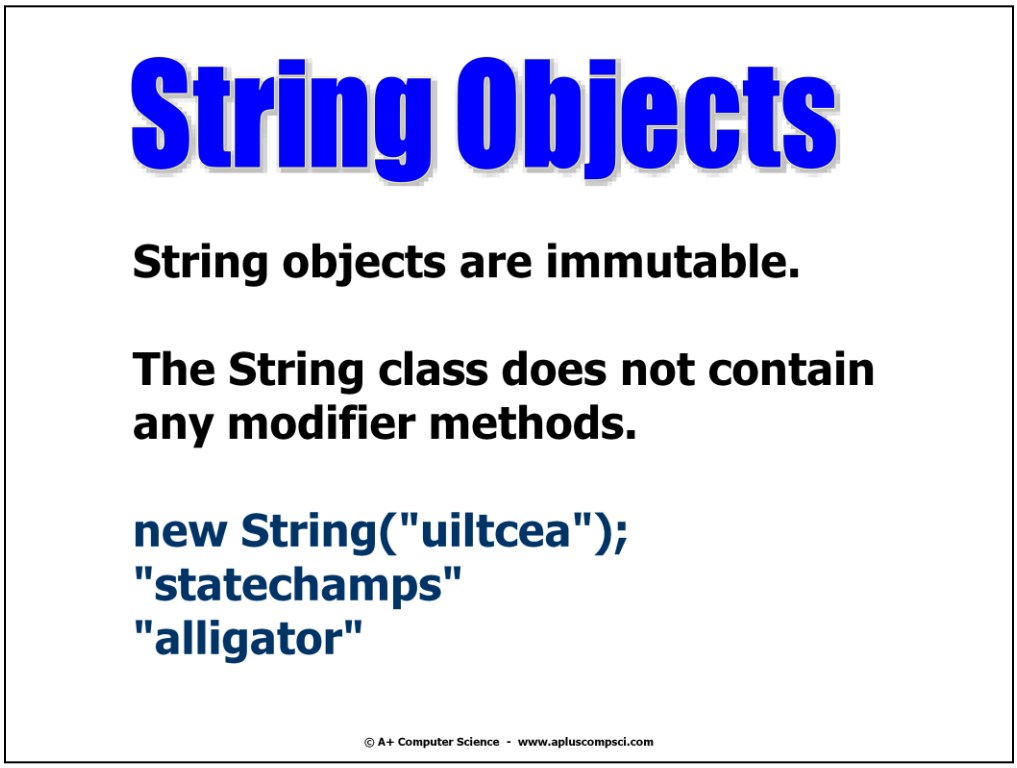
More Strings



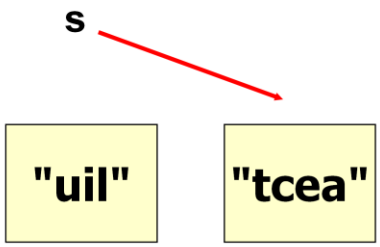
Once a String Object has been instantiated, that String Object can never be modified.

The String class does not contain any modifier methods.

String References

A String reference variable can be changed, but the String object the variable refers to cannot be changed.

```
String s = "uil";
out.println(s);
s = "tcea";
out.println(s);
```



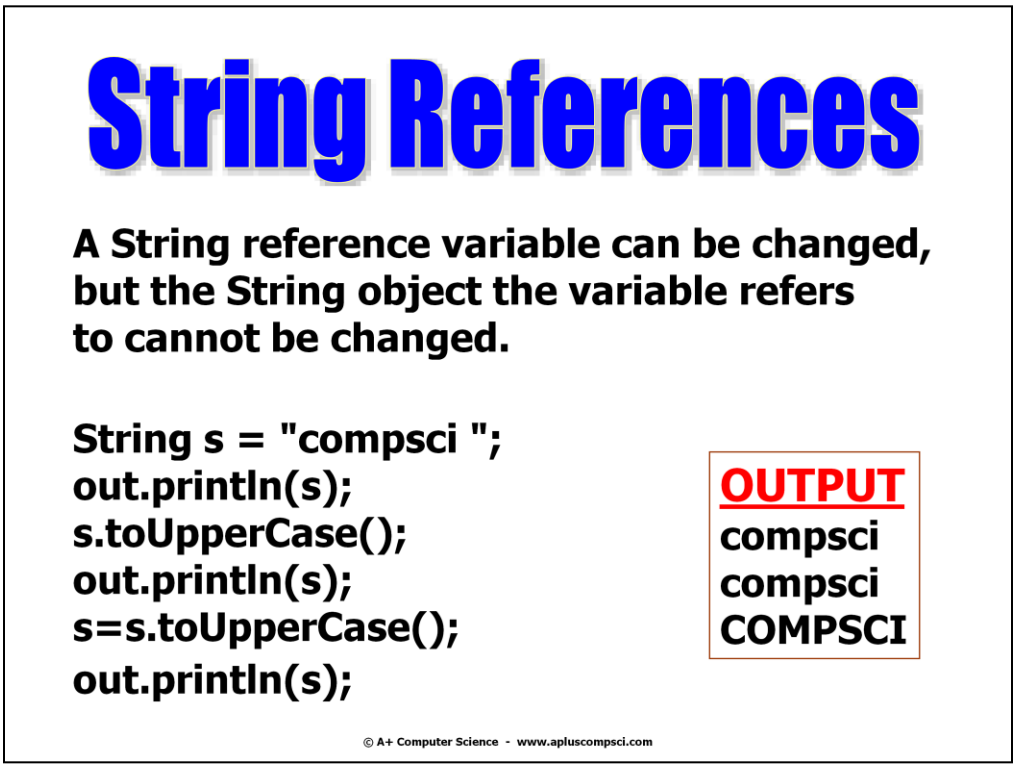
`s` is a reference that refers to a String Object.

`s` starts out referring to String Object `uil`.

`s` stores the location/address of String Object `uil`.

`s` is then referred to the String Object `tcea`.

`s` stores the location/address of String Object `tcea`.



`s` is a reference that refers to a String Object.

`s` starts out referring to String Object `compsci`.

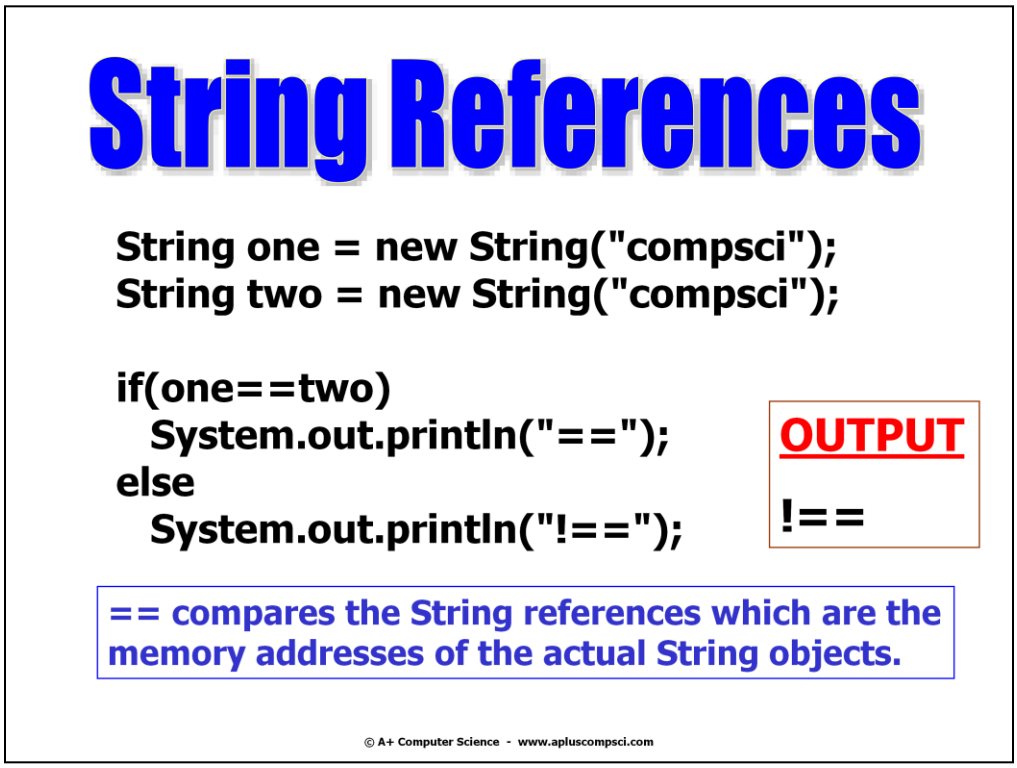
`s.toUpperCase()` returns a new String `COMPSCI`.

`s` is still referring to String Object `compsci`.

`s` is referred to `s.toUpperCase()`.

s.toUpperCase() returns a new String `COMPSCI`.

`s` is now referring to String Object `COMPSCI`.



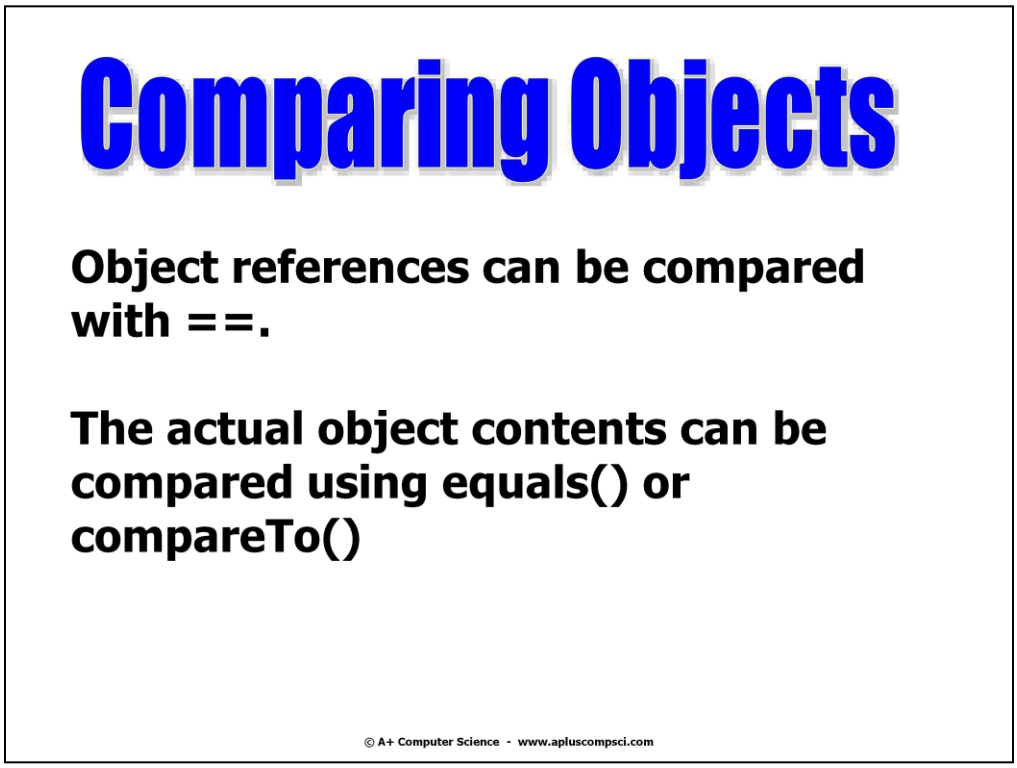
`one` is a reference that refers to a String Object.

`two` is a reference that refers to a String Object.

`one` starts out referring to a String Object `compsci`.
`two` starts out referring to a different String Object `compsci`.

`one==two` compares the locations/addresses stored in one and two.
`one` and `two` do not store the same location/address.

Open touppercase.java stringref.java



== can be used to compare the memory addresses of objects. .equals and .compareTo can be used to compare the actual object contents.

Comparing Objects

```
Integer one = 90;
Integer two = 75;

out.println(one.compareTo(two));
out.println(two.compareTo(one));

two = 90;
out.println(two.equals(one));
out.println(two.compareTo(one));
```

OUTPUT

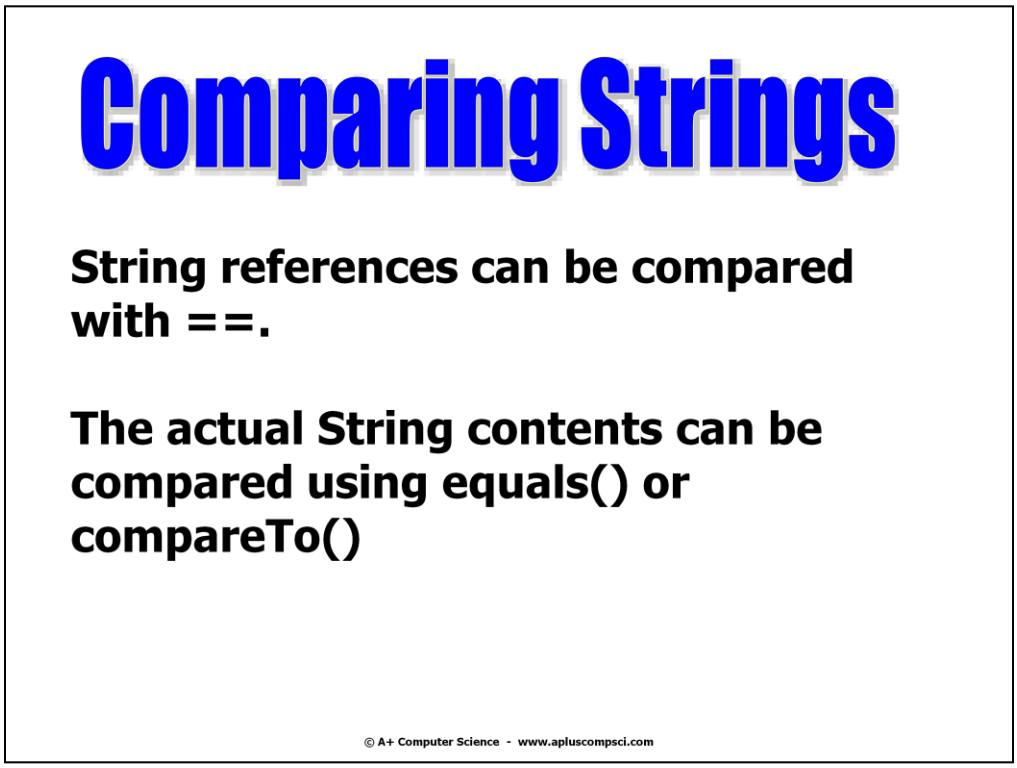
```
-1
1
true
0
```

compareTo() returns a negative value when A is less than B and a positive value when A is greater than B.
0 is returned with the A and B are the same.

The Integer compareTo() method compares the contents of the 2 Integer objects.
If a is greater than b, then a.compareTo(b) will return a positive value.

If a is less than b, then a.compareTo(b) will return a negative value.

If a is equal to b, then a.compareTo(b) will return 0.



== can be used to compare the memory addresses of objects. .equals and .compareTo can be used to compare the actual object contents.

String
frequently used methods

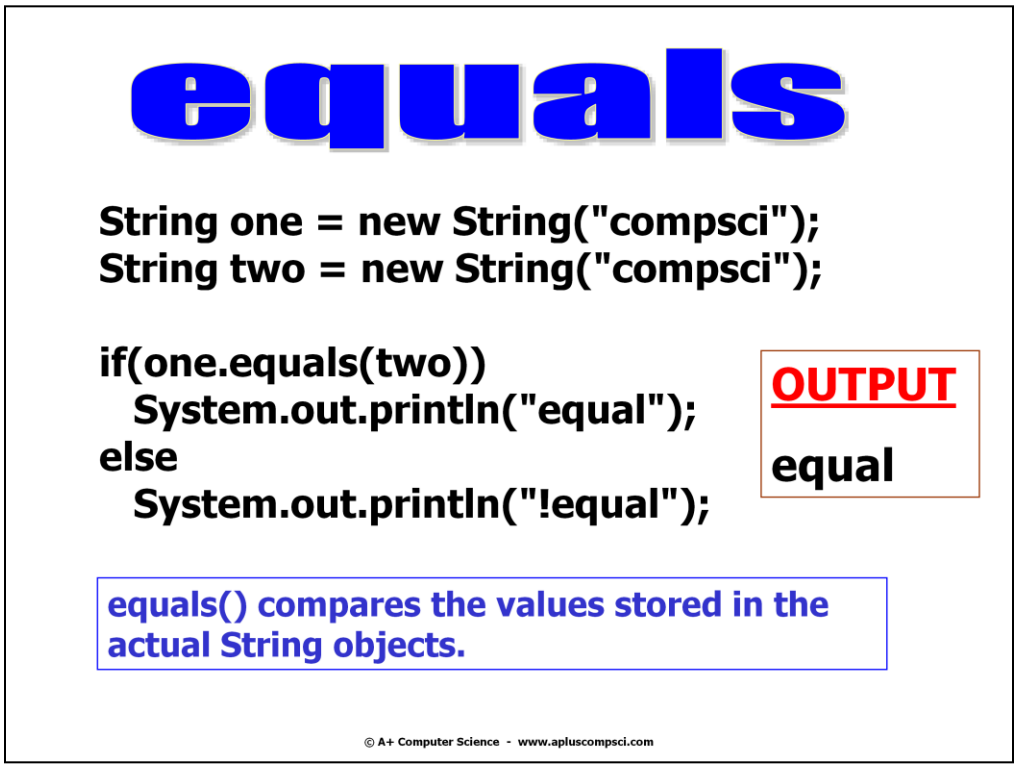
Name	Use
equals(s)	checks if this string has same chars as s
compareTo(s)	compares this string and s for >,<, and ==
trim()	removes leading and trailing whitespace
replaceAll(x,y)	returns a new String with all x changed to y
toUpperCase()	returns a new String with uppercase chars
toLowerCase()	returns a new String with lowercase chars

The chart above lists some very common and very useful String class methods.

`equals()` and `compareTo()` are used quite often.

`trim()` and `replaceAll()` are very useful, but that widely used.

`toUpperCase()` and `toLowerCase()` can be very useful in certain situations.

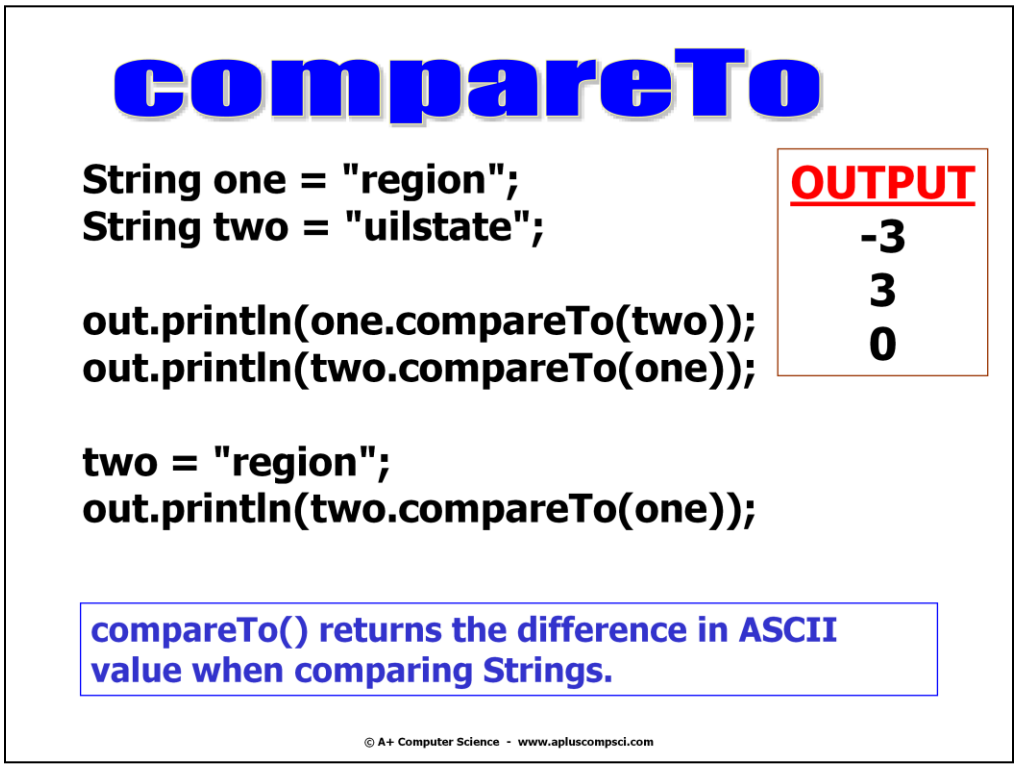


`one` is a reference that refers to a String Object.

`two` is a reference that refers to a String Object.

`one` starts out referring to a String Object `compsci`.
`two` starts out referring to a different String Object `compsci`.

`one.equals(two)` compares the contents of the String Objects referred to by `one` and `two`.
`one` and `two` both refer to String Objects `compsci`.
`one.equals(two)` is true.

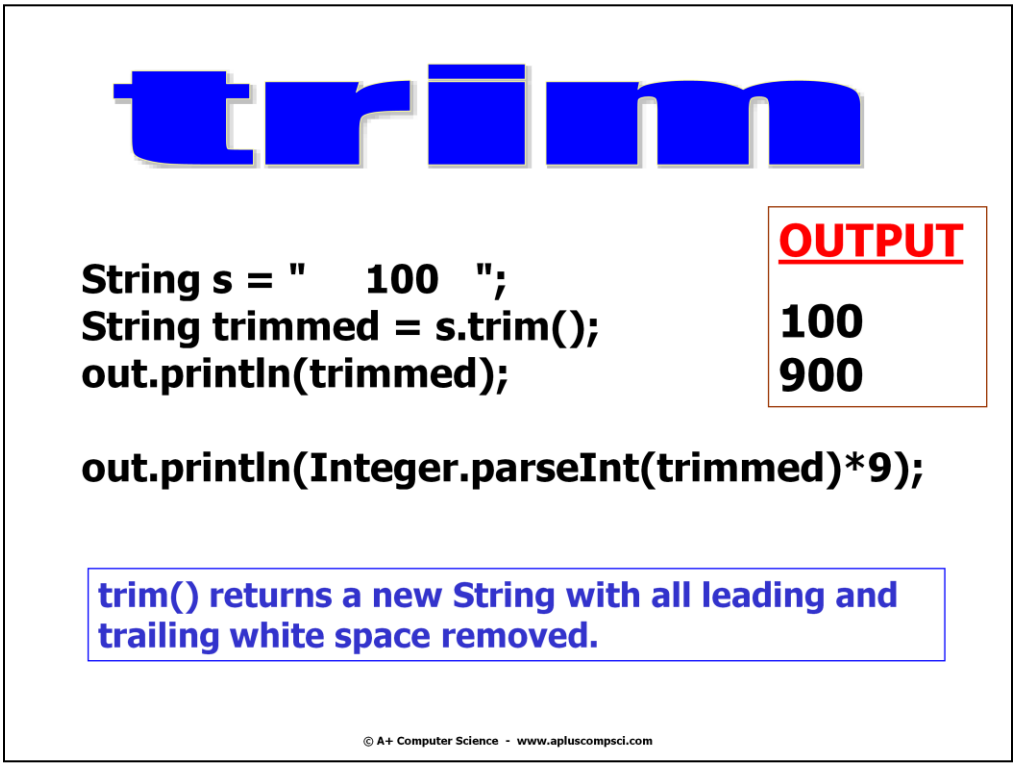


The String `compareTo()` method compares the letters stored in two String Objects.

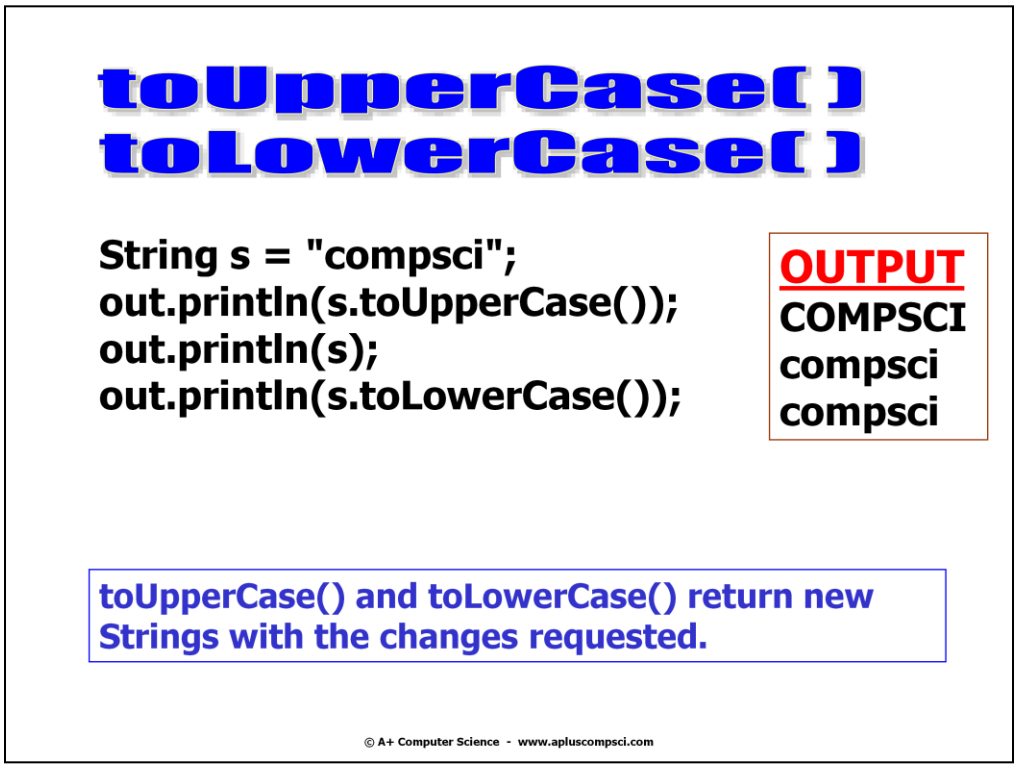
The difference in ASCII of the first two letters that do not match is returned.

Open equals.java

compareto.java

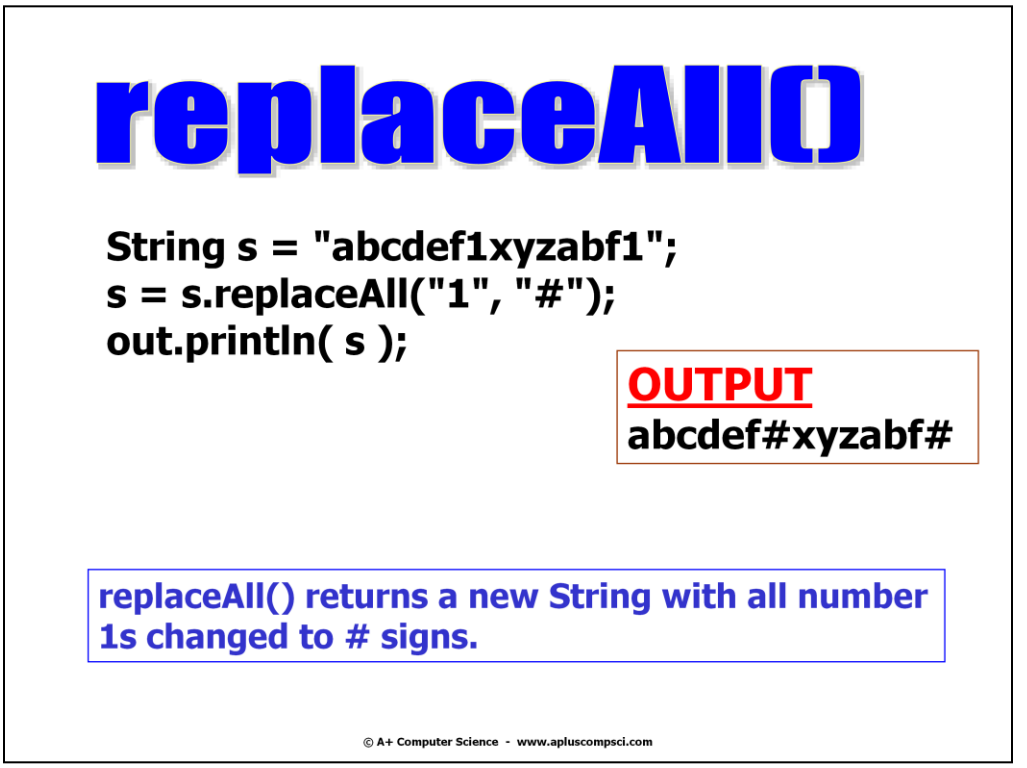


The `trim()` method is useful to remove leading and trailing spaces.



`toLowerCase()` and `toUpperCase()` both return new String Objects. The new String Object contains the same letters as the original String in all uppercase or all lowercase.

`toLowerCase()` and `toUpperCase()` do not change the original String Object. Both return a new String with the changes requested.



`replaceAll()` returns a new String with the changes requested. `replaceAll()` does not change the original String.

`replaceAll()` returns a new String with the specified letters replaced with the provided letters.

Open replaceall.java touppercase.java

Open trim.java stringtonums.java

Continue work on the labs