

The if Statement and Comparison Operators

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The if Statement

- Used to make decisions in a program
- Specifies what code to execute based on evaluating a test condition (boolean expression)
- Be careful using doubles! Roundoff error
- Syntax:
if (*<boolean expression>*)
 <then block>
else
 <else block>

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Relational Operators

Relational Operator	Meaning
>	Greater than
>=	Greater than or equal
<	Less than
<=	Less than or equal
==	Is equal
!=	Is not equal

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The if Statement (2)

- Example:
if(amt <= balance)
 balance = balance – amt;
- Example 2:
if(amt <= balance)
 balance = balance – amt;
else
 balance = balance – OVERDRAFT_PENALTY;

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The if Statement (3)

- If the then block or else block requires more than one line of code, enclose the code using curly braces ({ })

- Example:

```
if(amt <= balance) {  
    double newBalance = balance - amt;  
    balance = newBalance;  
}
```

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Selection Operator

- Syntax:
`value = test ? true : false;`

- Example:

```
y = x >= 0 ? x : -x;
```

- ... is the same as:

```
if(x >= 0)
```

```
    y = x;
```

```
else
```

```
    y = -x;
```

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Comparing Strings

- The `.equals` method checks to see if strings are the same

- Example:

```
if(s1.equals(s2)) {  
    System.out.println("s1 and s2 are the  
        same.");  
}
```

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Comparing Strings (2)

- Use `.compareTo()` to compare the order of Strings
- Example:

```
if(s1.compareTo(s2) < 0) {  
    System.out.println("s1 comes before s2 in  
        the dictionary");  
}  
if(s1.compareTo(s2) > 0) {  
    System.out.println("s1 comes after s2 in  
        the dictionary");  
}
```

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Comparing Objects

- Use `.equals()` to compare like objects (objects of the same type)
- Common problems:
 - Using `==` instead of `.equals`
 - Comparing dissimilar objects

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Comparing Objects (2)

- Example:

```
Rectangle r1 = new Rectangle(5,10,20,30);
Rectangle r2 = new Rectangle(5,10,20,30);
Rectangle r3 = r1;
if(r1.equals(r2)) {
    System.out.print("The contents of r1 and r2 are the");
    System.out.println(" same.");
}
if(r1 == r2) {
    System.out.println("r1 and r2 refer to the same object");
}
```

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References

- Jason Schwarz's Lecture 8 slides:
<http://courses.ncsu.edu/csc116/>