SOUTHERN ADVENTIST UNIVERSITY School of Computing

Conditional Execution

Chapter 5

For Next Time

- Read Chapter 5

Relational Operators

- Compare two expressions
- Evaluate to Boolean values: `true`, `false`

Operator	Meaning
==	is equal to
>=	is greater than or equal to
<=	is less than or equal to
<	is less than
>	is greater than
!=	is not equal to

Boolean Operators

- Combine simpler Boolean expressions to make compound Boolean expressions

e_1	e_2	e_1 && e_2 (and)	e_1 || e_2 (or)	! e_1 (not)
false	false	false	false	true
false	true	false	true	true
true	false	false	true	false
true	true	true	true	false

Evaluate the Expressions

```
int x = 5, y = 2;
```

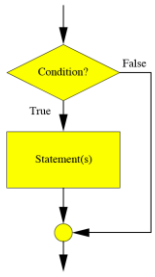
```
x >= 5
x > 5
x == 5
x == y
x != y
x >= 5 && y < 10
x >= 5 || y < 10
x < 0 && y > 10
```

```
x < 0 || y > 10
x > 0 && y > 10
x > 0 || y > 10
x > 0 || y < 10
x > 0 && x < 10
x > 0 || x < 10
x < 0 && x > 10
```


`if` Statement

- Conditionally execute sections of code based on the value of a Boolean condition

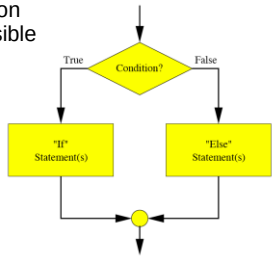
```
if ( condition )
   body
```



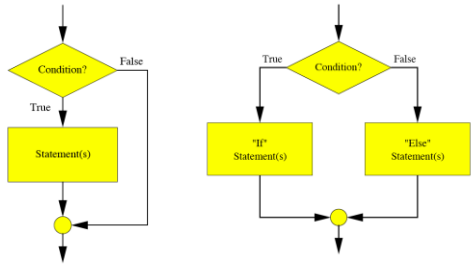
`if/else` Statement

- Select one execution path from two possible execution paths

```
if ( condition )
   ifbody
else
   elsebody
```



`if` vs. `if/else`



Nested Conditionals

- The body of a conditional statement can itself be a conditional statement
- The logic of such nested conditionals can be arbitrarily complex
  - Can do lots of cool things
  - Can be difficult and tricky to do correctly

Example

- Determine if a given number is within a specified range
- Write a method that returns a string that says if a given argument is either too low, too high, or just right

Multi-way `if/else` Statements

- Follow the formatting suggestion in the book to avoid deeply nested conditionals' tendency to "creep" to the right off the screen
- This format hides the true logical structure, but provides an easier to read practical structure

Errors in Conditions

- It is easy to get compound condition expressions wrong
- Evaluate these expressions:
  - `value > 0 || value < 10`

    tautology
  - `value < 0 && value > 10`

    contradiction

Next . . .

Iteration