Boolean Logic and Nesting Ifs

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Opening Discussion

- Let's look at solutions to the interclass problem.
- Minute essay comments:
  - Will there be a review before the test?
  - Various decision questions.
  - Flying pigs.
  - Activities.

Motivation

- I want to have a function that tells me if two squares intersect.
- The function will be given the x and y location of the center of each square as well as the length of the side of each square.
- It should return a Boolean telling if they intersect.

Conditional Logic

- We talked about comparisons of values in the last class.
- We can also combine Boolean expressions together using Boolean logic.
- There are four Boolean operators:
  - && for and
  - || for inclusive or
  - ^ for exclusive or
  - ! for not

Short Circuit Operators

- The && and || operators are short circuit operators.
- This means that if the value is known after evaluating the first operand, the second operand won't be evaluated.
- This can prevent errors.
- Let's look at an example of this with division by zero.

Nesting ifs

- What you put in an if can be any expression or statement.
- As a result, you can put an if inside of another if.
- As we will see, Scala doesn't care what you nest inside of things. You write the logic that makes sense to you and says what you want to say.

The match Expression

- There is a second conditional expression in Scala called match.
  - *expr* match {
    - case *pattern* => *expr*
    - case *pattern* => *expr*
    - ...
  - }
- There are lots of options for the pattern, but the simplest one is literal values.

Ray Tracing

- Now I want to start having us write some more significant code.
- I want to write some functions that deal with 3-D geometry with the eventual goal of being able to do ray tracing.
- What could we use to represent these in Scala?
  - Vectors
  - Points
  - Spheres
  - Planes

Minute Essay

- Is there anything you would like to see us code? What problems do you want to be able to solve on a computer?
- Interclass problem:
  - Write functions that do some operations to vectors that we didn't get to in class using tuples.