Writing Boolean Expressions
Examples

• Write a C++ Boolean expression that corresponds with the following assertions:
  X is not less than 2
  1.) X >= 2
  2.) !(X < 2)

  X is strictly between -5 and 5
  1.) (-5 < X) && (X < 5)
  2.) (X > -5) && (X < 5)

  X and Y are equal to 3
  (X == 3) && (Y == 3)

  X is positive
  1.) X > 0
  2.) !(X <= 0)

Isosceles Triangles

• An isosceles triangle is a triangle with exactly two sides having the same length.

• Write a program that lets the user enter three numbers and determines whether the numbers could be the lengths of the sides of an isosceles triangle.
Analysis

• Input:
  – Three numbers to test

• Output:
  – Whether the three numbers could be the lengths of the sides of an isosceles triangle

Additional Information

• How do we know if the three numbers could be the sides of a triangle?
  – Three numbers a, b, and c could be the lengths of the sides of a triangle if the sum of every pair of sides is greater than the length of the remaining side.

Algorithm

• Get the three lengths from the user
• Determine whether the lengths could be the sides of an isosceles triangle
• Output the results

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1.1 Prompt the user for three lengths
1.2 Read in the numbers

Algorithm, continued

2.1 Determine whether the lengths could be the sides of a triangle
triangle = ???

2.2 Determine whether the lengths could be the sides of an isosceles triangle
isosceles = ???
Program Testing

• What situations should we test?
  – Isosceles triangle true
    • All different combinations of which sides are equal
  – Triangle true, but not isosceles
    • No sides same length
    • Three sides same length
  – Not a triangle
    • Any numbers that are not a triangle
    • Numbers that are not a triangle, but two lengths are the same