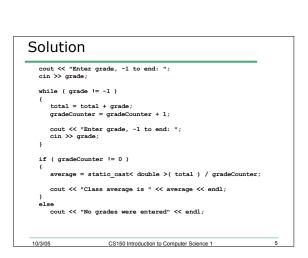


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Problem

10/3/05

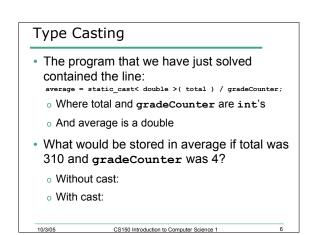
• 12.1 Write a program that reads an

calculates the average student grade

· The answer is on the following slides

undetermined number of student grades and

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Type Casting

- To produce a floating point calculation with integer values, we must convert one of the operands to a floating point
- static_cast< double >(total)
 - Stores a temporary version of total as a double
 - $_{\circ}\,$ If total was 310, it will be stored as 310.0 $\,$
 - $_{\circ}\,$ This temporary value will be used in calculations

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Called an explicit conversion

Type Casting

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- C++ can only evaluate expressions where both operands are of the same type
- static_cast< double >(total) / gradeCounter
 - Is trying to divide a double by an int
 double / int
- Compiler performs a promotion (implicit conversion) on the int to make it a double
 - If gradeCounter was 4, will now be 4.0

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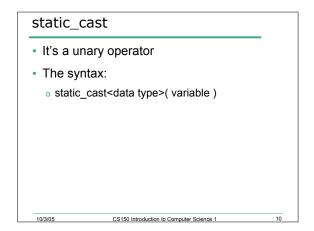
Type Casting

10/3/05

10/3/05

- average = static_cast< double >(total) / gradeCounter;
- If total was originally 310 and gradeCounter was 4, compiler will
 - o 310.0 / 4.0
 - o Results in 77.5
- If average is a double, then 77.5 is stored
- If average is an int then the fractional part will be truncated

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Operator Precedence & Associativity				
()	L->R	Parentheses		
<pre>static_cast<type>()</type></pre>	L->R	Unary		
!, +, -	R->L	Negation, Unary +, -		
*,/,%	L->R	Mult, div, mod		
+, -	L->R	Add, Subtract		
<<, >>	L->R	Insertion/extraction		
<, <=, >, >=	L->R	Relational		
==, !=	L->R	Equality		
88	L->R	And		
11	L->R	Or		
=	R->L	Assignment		
10/3/05 CS150 Introduction to Computer Science 1 11				

A Note on Stepwise Refinement P. 87 - 89 in your book describe the process of top-down stepwise refinement This is a really useful process for solving a problem It describes how to start from the top-most description of the problem and refining it until you have a detailed description of the process

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· Be sure to read it!

10/3/05

Top-Down, Stepwise Refinement

- There is a description of how to solve a complete problem using top-down, stepwise refinement on p. 94 - 98
- The solution to this problem requires that an if selection structure be embedded within a while repetition structure

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Assignment Operators

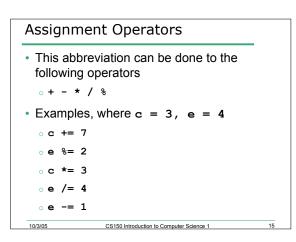
 We've seen that C++ provides the ability to abbreviate an assignment operator in which the same variable appears on either side of the operator

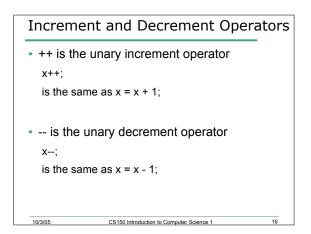
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- sum = sum + num;
- · Can be abbreviated to
- sum += num;

10/3/05

13

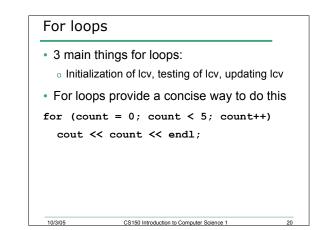


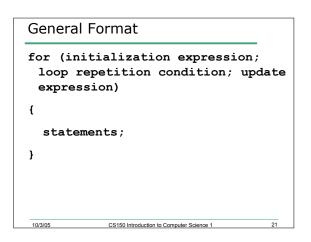


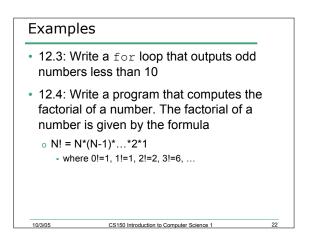
Pre-increr	Pre-increment vs. post-increment			
Pre	Post			
k =x;	k =x;			
k = ++x;	k = x++;			
Increment/	Assign value of x to			
decrement x	k, then increment			
then assign	or decrement x			
value of x to	k			
10/3/05	CS150 Introduction to Computer Science 1 17			

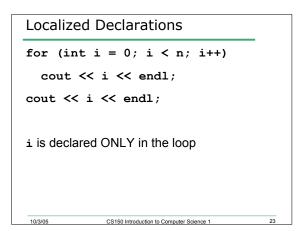
Example							
12.2: What is the output if i = 2?							
cout	<<	"Value	of	x is	s″ <•	< i;	;
cout	<<	"Value	of	i++	is″	<<	i++;
cout	<<	"Value	of	++i	is″	<<	++i;
cout	<<	"Value	of	i	is″	<<	i;
cout	<<	"Value	of	i	is″	<<	i;
10/3/05		CS150 Intro	duction t	o Computer	Science 1		18

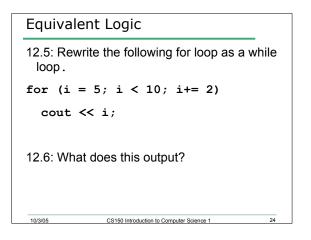
Operator Precedence				
()	L->R	Parentheses		
++,, static_cast <type>()</type>	L->R	Unary post-op		
++,, !, +, -	R->L	Negation, Unary pre-op		
*,/,%	L->R	Mult, div, mod		
+, -	L->R	Add, Subtract		
<<, >>	L->R	Insertion/extraction		
<, <=, >, >=	L->R	Relational		
==, !=	L->R	Equality		
£ &	L->R	And		
11	L->R	Or		
?:	R->L	Conditional		
=, +=, -=, *=, /=, %=	R->L	Assignment		
10/3/05 CS150 Introduction to Computer Science 1 19				











Problem

10/3/05

• 12.7: Write a program that will print the sum of the odd integers between 1 and 50 inclusive. Write one program using a while and the other using a for loop

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Problem

10/3/05

25

- 12.8: Write a program that allows the user to enter an unknown number of integer values one at a time. When the user enters -999, you are to terminate the loop and print the following:
 - The sum of all integers inputted
 - The average of all integers inputted
 - o The largest integer of all integers inputted

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Summary · In today's lecture we covered • Type casting • Top-down, stepwise refinement • Abbreviating assignment operators Increment and decrement operators • for repetition structures Readings • P. 92 type casting • P. 93, p. 113 formatting output P. 94 - 98 top-down, stepwise refinement • P. 98 Assignment operators • P. 99 - 102 Increment and decrement operators • P. 104 - 113 for repetition structures 10/3/05 CS150 Introduction to Computer Science 1 27