

For Friday

- Read Becker, 7.3
- Recommended practice problems:
 - Chapter 7, problems 1-6

Program 5

Questions before the quiz?

Quiz

A Harvester That Counts

Testing Classes

- Why test?
- What's involved in testing?
- Why try to automate testing?

Testing Is Important

- Write a main in each class that tests that class's methods.
- Write multiple tests if the method has multiple possible outcomes.
- “Unit testing”
- Write your tests before you write your code.

Types

- Types are used in Java when declaring any kind of variable (or named constant).
- They determine what values a variable may hold.
- They determine what operations can be performed on that variable.

Kinds of Numbers

- Integers
 - byte
 - short
 - int
 - long
- Floating point numbers
 - float
 - double

Arithmetic

- There are 5 arithmetic operators in Java:
 - + - addition
 - - - subtraction
 - * - multiplication
 - / - division
 - % - modulus

Precedence

- Multiplication, division, and modulus have higher precedence than addition and subtraction.
- Always work left to right.
- This is no different from what you learned in grade school.

Integer Division

- Dividing two integers results in an integer—ALWAYS.

Practice

- Give the value of `int` variable `ans`
 1. `ans = 5 / 3;`
 2. `ans = 5 % 3;`
 3. `ans = (3 / 2) * 2;`
 4. `ans = 3 / 4;`
 5. `ans = 17 % 4;`
 6. `ans = 14 - 10 / 2 + 8;`

Practice

- Give the value of `int` variable `ans`

7. `ans = (14 - 10) / 2 + 8;`

8. `ans = 14 - 10 / (2 + 8);`

9. `ans = 4 / 7;`

10. `ans = 12 % 2;`

11. `ans = 25 % 7;`

12. `ans = 7 / 2;`

Practice

- Give the value of **double** variable **val**

13. val = 7 / 2;

14. val = 7.0 / 2;

15. val = 3 + 1 / 2.0;

16. val = 3 / 2 * 2.0;

Equality and Floating Point

- Cannot rely on two floating point values to be equal.
- Why?
- How can we handle it?

Type Conversion

NumberFormat

- Write a **method** to compute the sum of all integers between first and second (including first and second), where first and second are integers and $\text{first} \leq \text{second}$. The method should return the sum. You may not change the value of either first or second.

- Write a method to find the smaller of two integers. The method will accept two integers and return the smaller of the two. If they are the same, then the method returns either one of them.

- Telephone company rules to calculate the cost of a long distance call are as follows.
 - If the cost of the call is over 60 minutes, the cost is 7 cents per minute.
 - If the call is over 20 minutes long, the cost is 10 cents per minute.
 - If the call is 20 minutes or less, the cost is 13 cents per minute.
- Write a method that takes the length of a call in minutes and returns the per minute rate for that call.

- A carpenter computes the price of a desk as follows:
 - The charge for all desks is a minimum of \$200
 - If the surface (length * width) is over 750 square inches, add \$50
 - If the wood code is 1 (mahogany), add \$100. If the wood code is 2, add \$75. If the wood code is 3 (pine), there is no extra charge.
- Write a method that takes the surface of a desk and the wood code and returns the cost of the desk.

- A company gives bonuses based on production as follows:
 - 1000 units or fewer, the bonus is \$25
 - 1001 to 3000 units, the bonus is \$50
 - 3001 to 6000 units, the bonus is \$100
 - 6001 units and up, the bonus is \$200
- Write a method that accepts the number of units produced and determines the bonus for the employee. Return the bonus.

- Write a method to determine the purchaser's discount based on a code.
 - If the code is 7, the discount is 10%.
 - If the code is 3, the discount is 15%.
 - If the code is 12, the discount is 4%.
 - If the code is 1, there is no discount.
 - If the code is 8, the discount is 30%.
- The method should return the discount. Use a switch statement.