CS 157 Lab 8 October 27, 2009
if -- else

1. Create a new class called **Lab8**. Write a static method named **`median`** that accepts three integers as parameters and that returns the middle value of the three. For example, `median(7, 3, 9)` returns `7` and `median(29, -14, 11)` returns `11`.

   I recommend that you start by writing the signature of the method, then just return anything so the method compiles. Then right click on **Lab8** in the Projects panel, select Tools, and then Create JUnit tests. Take the defaults, then code the examples above as assertions. You should see a new class in the Test Packages folder that contains your test code. Right click on the test class and run it as a file. It should fail. Now go back to the original class that contains the `median` method (Lab8) and make it pass the tests. Here's a hint on how to think about it: the first parameter is the median if it's bigger than the second and less than the third OR if it's bigger than the third and less than the second. (Of course, "bigger" should be "bigger than or equal to" etc.). You can then do the same for the second parameter, and if neither of them turns out to be the median, then the third one is it. The code won't be pretty, but there isn't an elegant way to do this at this point that I know of.

   Once you get your method to pass the tests, go back and add a couple more tests. Make sure you test the possibility that the answer can be in any of the parameters. Test the possibility that some of the parameters could be equal.

2. Write a static method named **`tax`** that accepts a salary as a parameter and that returns the amount of federal tax you would owe if you made that salary. The tax is computed based on your tax bracket as found from the first two columns below. Once you know which row of the table to use, start with the "flat amount" and add the "plus %" of the amount over the amount listed in the final column. For example, if your income is $50,000, then you use the third row of the table and compute the tax as $4,000 plus 25% of the amount over $29,050, which comes to $9,237.50. The total tax on $27,500 is $3,767.50. For $6,000, the tax is $600. For $120,000, the tax is $28,227.

over	but not over	flat amount	plus %	of excess over
$0	$7,150	$0	10%	$0
$7,150	$29,050	$715	15%	$7,150
$29,050	$70,350	$4,000	25%	$29,050
$70,350	*unlimited*	$14,325	28%	$70,350

   You may assume that your method is passed a value greater than or equal to 0.

   Since the amounts you are using will be doubles, you will need to be careful in testing for equality within JUnit. You might notice that if you try using an "assertEquals" method for this in JUnit, the method name shows up with a black line through it. This is JUnit's way of telling you that you should not be testing doubles for equality. As you know, doubles are not stored exactly in the computer. So if you want to test for equality, you need to test the amounts to be equal within a certain tolerance. Since all of the amounts we are testing in this method are dollar and cent amounts, the tolerance you can use is 0.005 (the nearest half cent). All you have to do is include 0.005 as a third argument in the assertEquals method. Code all four example salaries and tax amounts as tests in JUnit, and make sure they all pass.

Copy both Lab8.java and Lab8Test.java to the shared drive.