

CSCI 2990 Assignment 3 Spring 2009

Due March 5

Write a Java program using a **while** loop that computes the value of π to 3 significant figures using the infinite series

$$\pi = 4 - 4/3 + 4/5 - 4/7 + \dots$$

- The variables must be *double* so that the fractional parts will not be truncated.
- Notice that each numerator in the series is 4.
- Notice that first denominator is 1, and the rest are all odd integers as well.
- Notice that every other term is multiplied by 1 or -1. But the first is multiplied by 1, so set multiplier equal to 1.
- This program will run as long as the difference between two successive approximations is greater than .0005. So initially set the difference to a number greater than .0005.
- Also initialize pi to 0 because before you add the first term, it has the value 0.
- Then comes the loop. As long as difference is greater than .0005,
 - The old value of pi needs to be saved before the next term is added. So set oldpi equal to pi.
 - Each time through the loop, the value of pi is the previous value of pi plus the multiplier times the numerator divided by the denominator.
 - You need to add 2 to the denominator to get ready to compute the next term.
 - You need to multiply the multiplier by -1 so it alternates between 1 and -1 in the next term.
 - Then you need to compute the difference between this new value of pi and the old one, which would be written `difference=Math.abs(pi-oldpi)`
- Eventually the loop is exited because its difference is no longer greater than .0005. So just print pi. You also might want to print `Math.PI` to see the difference.