Materials

- Arduino Uno

Background & Set-Up:

https://en.wikipedia.org/wiki/Leibniz_formula_for_%CF%80

We will be using the Leibniz formula for π.

$$\pi = 4 - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} - \cdots$$

$$\pi = \sum_{k=0}^{n} (-1)^{n-1} \frac{4}{2n+1}$$

You will set up the Arduino to communicate with your computer using the Arduino's serial port bus that communicates over the USB connection. Use the Arduino-PC Serial Comms starter code to see how to set up the connection. To send a message to your Arduino from your PC, open the serial port monitor (Tools->Serial Port Monitor). Double-check to make sure the settings match your parameters you set up in your program.

Goal:

We want to write a program that will approximate Pi up to the number of terms in the series expansion as specified by the user (User is specifying the value of n). You will have to perform the summation by doing the math for every term up until the term specified. We don't want to use a look-up table!

Input: "4"
Output; "The approximate value of pi is 2.895238"

Input: "9"
Output; "The approximate value of pi is 3.252366"