```
# Program 1
# Due date: 8/28/18

#description: This program will run a loop that will display the value
#of pi when a user is prompted for an input for the number of iterations

import math

def calcPie(n):

    #operations to use True=Addition, False=Subtraction
    Addition=False # this is how you do addition first
    Subtraction=True #this is how you would do subtraction
    coefficient=3.0 #this is the container for your coefficient
    exponent=1 #this is the container for your exponent
    Sum_of_pie=math.sqrt(12) # this is the acummaltor for pie
    math_accum = 1.0 #this will hold your accumulator for math

    i=2

    #this is your while loop containing your number of iternations
    while(n >= i):
        print(i, "out of", n)
        print("var",exponent, coefficient, i)
        if(Addition):
            print("i'm adding")
            math_accum = math_accum + ( 1 / (coefficient * 3 ** exponent))
            print(math_accum)
            print(( 1 / (coefficient * 3 ** exponent)))
            Subtraction=True
            Addition=False
        else:
            print("i'm subtracting")
            math_accum = math_accum - (1/(coefficient * 3 ** exponent))
            print(math_accum)
            Subtraction=False
            Addition=True

        exponent=exponent+1
        coefficient=coefficient+2
```

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42
43          i = i + 1
44
45          print(exponent, coefficient, i)
46          print("looping")
47
48      Sum_of_pie=Sum_of_pie*math_accum #this is the final type of math you need to do
49      print(Sum_of_pie)
50
51  def main():
52
53      #first you need to get the input aka the number of loops you use
54      #get a numeric input from the user
55
56      while True:
57          try:
58              n=int(input("Put in a number of iterations:   "))
59              break
60          except ValueError:
61              #this is the error that will appear if a number is not correct
62
63              print("Type in a value:   ")
64
65      calcPie(n)
66
67
68  main()
69  #the main() here is required for the program to run
70
```

Results

```
Put in a number of iterations:   4
 2 out of 4
 var 1 3.0 2
 i'm subtracting
 0.8888888888888888
 2 5.0 3
 looping
 3 out of 4
 var 2 5.0 3
 i'm adding
 0.9111111111111111
 0.022222222222222223
 3 7.0 4
 looping
 4 out of 4
 var 3 7.0 4
 i'm subtracting
 0.9058201058201059
 4 9.0 5
 looping
 3.1378528915956805
```