Abstract 863–11–482: A Spigot Algorithm for Pi

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The 14-line program to the right computes and prints 1000 decimal digits of pi. The algorithm is unusual for its brevity and the fact that it uses only integer arithmetic (no floating point or multiprecision computations are required). The program runs to completion on a Macintosh IIci computer in under 10 seconds. A similar program computes pi to 10,000 decimal places in under 30 minutes. This paper will explain the theory behind this algorithm and will show how to modify the program to produce additional digits.

```
      integer vect(3350), buffer(201)
      data vect/3350*2/, more/0/
      DO 2 n=1, 201
         karray = 0
      DO 3 L=3350, 1, -1
         num = 100000*vect(L) + karry*L
         karry = num/(2*L-1)
3        vect(L) = num - karry*(2L-1)
      k = karry/100000
      buffer(n) = more+k
2     more = karry - k*100000
      write(*,100) buffer
100   format(1x,I1,'.'/(1x,10I5.5))
      end
```

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