Digits of π Sequence

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Apu insists that he has an excellent memory:
In fact I can recite π to 40,000 places. The last digit is one!
[Marge in Chains]

How many digits of π do you know by heart?
What is the probability that Apu is correct if he randomly guessed?

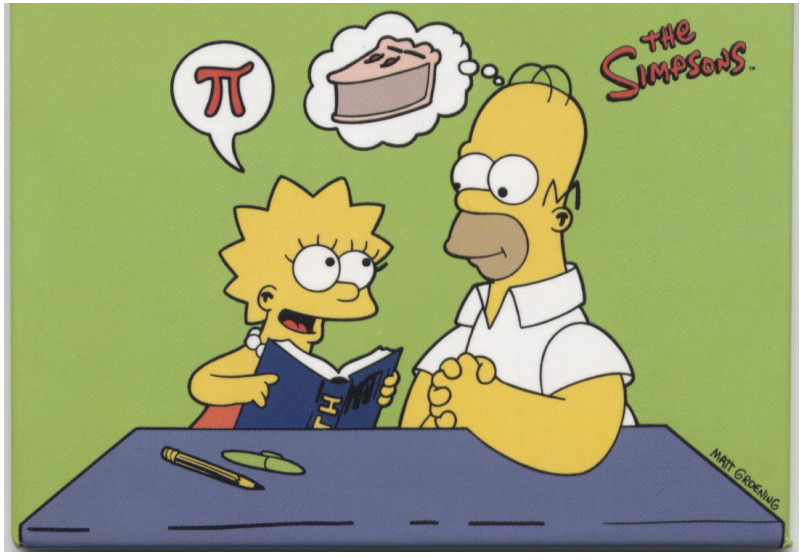
Hideaki Tomoyori: World Record 1987-1995

I want to go on with the challenge of memorizing π, for just the same reason that people climb high mountains. I think it's a wonderful thing to challenge the limits of what we can do... the more one memorizes of it, the closer one comes to the real value of the circle - closer to perfection.

Research on Hideaki Tomoyori: World Record 1987-1995

Researchers compared his cognitive abilities with a control group and concluded that they were not superior; they attributed his achievement to extensive practice.

Apu is Correct



- The 40,000th digit of π is one if he is counting digits following the decimal point

3.14159265358979323846264338327950288419716939937510582097494459230781640628620899862803482534211706798214808651328230664709384460955058223172535940812848111745028410270193852110555964462294895493038196442881097566593344612847564823378678316527120190914564856692346034861045432664821339360726024914127372458700660631558817488152092096282925409171536436789259036001133053054882046652138414695194151160943305727036575959195309218611738193261179310511854807446237996274956735185276...

150781468526213325247383765 1...

Researching 1 Billion Digits of π

$$\frac{1}{\pi} = 12 \sum_{k=0}^{\infty} \frac{(-1)^k (6k)!(545140134k + 13591409)}{(3k)!(k!)^3 (640320)^{3k+\frac{3}{2}}}$$

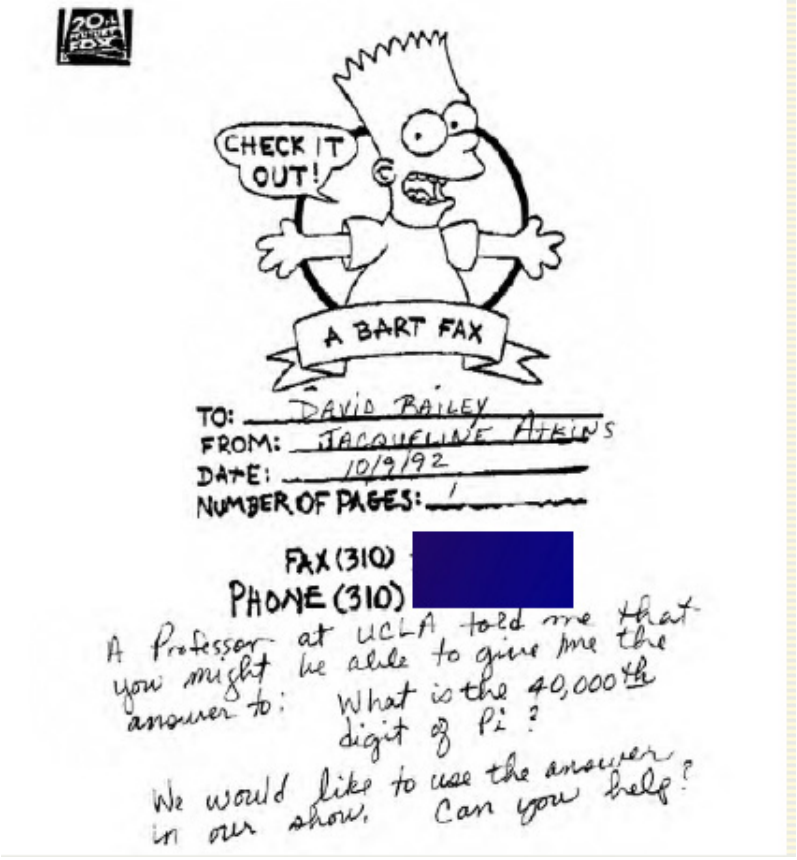
David and Gregory Chudnovsky (1989). Their algorithm is used by computer algebra software.

- **David**: *π is the best stress test for a supercomputer*
- **Gregory**: *π is a damned good fake of a random number... It cannot be that π is truly random? Actually, a truly random sequence of numbers has not yet been discovered.*
- **David**: *Exploring π is like exploring the universe.*
- **Gregory**: *...Our computer is the flashlight*

Marge in Chains: The Simpsons

Al Jean

The 40,000th digit of π is 1



The 40,000th digit of π is 1

Bailey, Borwein and Plouffe, 1996

$$\pi = \sum_{i=0}^{\infty} \frac{1}{16^i}\left(\frac{4}{8i+1} - \frac{2}{8i+4} - \frac{1}{8i+5} - \frac{1}{8i+6}\right)$$

The 40,000th digit of π is 1

Bailey, Borwein and Plouffe, 1996

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The Simpsons: 22 Short Films About Springfield

Jeff Westbrook: *Nothing trains you better and gives you more analytical skills than mathematics. That skill is useful in the craziest places you might imagine: writing a TV show, writing a cartoon, and lawyering perhaps.*