Chapter 1: Fibonacci Poems

The house in Aberdeen where we used to live had a large garden surrounded by woodland and fields. My initial enthusiasm for filling the borders with flowers was soon tempered by the fact that the garden was a happy feeding ground for rabbits. They bred like their proverbial namesakes – in a matter of months, one or two fluffy little bunnies gambolling sweetly at the bottom of the lawn became a dozen or more, brazenly nibbling my roses and petunias.

Perhaps the 13th century mathematician Leonardo Pisano also had pesky rabbits destroying his plants, for in his book *Liber Abaci*, published in 1202, he posed the following problem:

Suppose there are two baby rabbits in a walled field, one male and one female. After one month they are mature enough to breed, and consequently at the end of the following month they produce a baby pair of their own, again one male and one female. Assuming the rabbits continue to reproduce in the same way, how many pairs of rabbits will be in the field after one year?

Pisano's nickname was Fibonacci, and the sequence generated in this way is called the Fibonacci sequence:

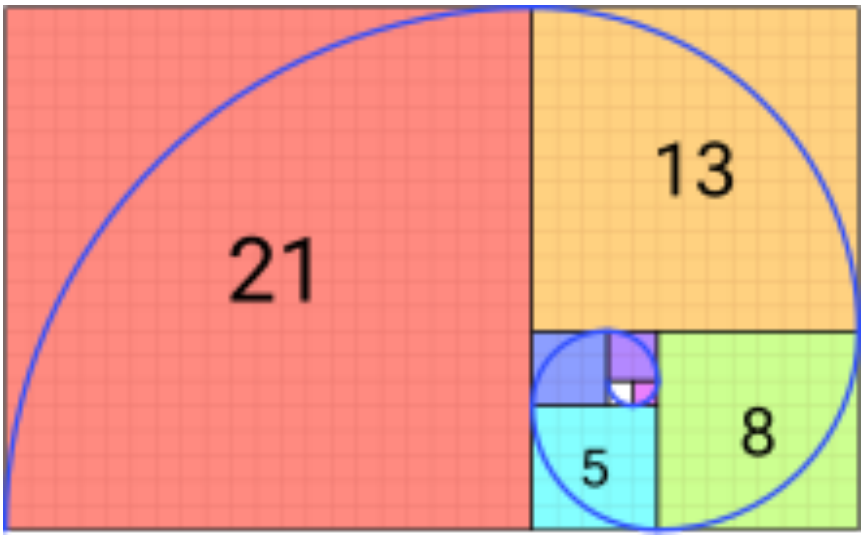
1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...

After the first two terms, each successive term is the sum of the two previous numbers:

2 = 1 + 1, 3 = 1 + 2, 5 = 2 + 3 and so on.

Although the problem about breeding pairs of rabbits is clearly unrealistic (one female may produce a litter of six or more baby bunnies!), Fibonacci numbers frequently appear in biological contexts. Lilies, for example, have three petals, buttercups have five. The seeds on a sunflower and the bracts on a pinecone are arranged in Fibonacci patterns.

There is a connection between the Fibonacci sequence and the aesthetically pleasing golden ratio $\varphi = \frac{1+\sqrt{5}}{2}$, approximated by the ratio of length to height in the rectangle below. (The spiral within the rectangle is called the Fibonacci spiral.).



Source: Wikimedia

Well before the time of Leonardo Pisano, the sequence was known to Indian mathematicians. The mathematician and poet Pingala (c. 450 BC – 200 BC) wrote a treatise on Sanskrit prosody, which featured Fibonacci numbers in the enumeration of metrical patterns.

In the latter part of the 20th century, poets such as Ron Silliman and Inger Christensen began to explore the creative possibilities of the sequence in their writing. Silliman's prose poem *Tjanting* (1981) has nineteen sections, with the number of sentences in each section determined by the Fibonacci sequence. Christensen's poem *alfabet*, originally published in Danish in 1981, draws on both the letters of the alphabet and the Fibonacci sequence in its structure. The first section, "A", consists of a single line, while the 14th and final section, "N", has 610 lines.

However, it was not until April 2006 that the 'Fib poem' gained widespread popularity following a blog post by Gregory Pincus, a writer based in Los Angeles. Pincus defined a Fib poem as 'a six line, 20 syllable poem with a syllable count by line of 1/1/2/3/5/8 – the classic Fibonacci sequence.'

Intrigued by this new poetic form, the poet, playwright and publisher R.G. Rader founded an online journal called *The Fib Review* devoted to poetry based on the structure of the Fibonacci sequence. The inaugural editorial of Fall 2006 stated the intention for the journal to be 'a space where the new form can take hold, expand, and always be open to experimentation.'

Here's a classic six-line Fib poem by contemporary American poet B.A. France:

Looking

moon
light
rising
above the
skeletal treetops
she wonders what tomorrow brings

Note how perfectly suited the poem is to the chosen form. It unfolds quietly and organically, before opening out as the perspective shifts. The last line both completes the poem and invites us to ponder with its persona – a woman? the moon herself? – an indefinite future that connotes the unending Fibonacci sequence.

As a simple, fun, and engaging interface between poetry and mathematics, Fib poems are a wonderful teaching tool. Part of their charm lies in their accessibility: the intrinsic pattern is easy to understand, and it doesn't require much verbal dexterity to match words to the syllable count.

However, the possibilities extend well beyond the classic six-line version. The growth and/or decay in line lengths can allow for creative use of space and shape on the page. Consider, for example, Colin Bell's poem 'Pandemic' with its skilful employment of ascending and descending cadence:

Pandemic

Sun
hat,
tweed coat,
locked-down walk
two meters alone,
the old man is promenading.
I see him every day shuffling home past my window,
his mouth is open but not for a scream, his jaw hangs loose, the grimace unintended.
He isn't weeping - blocked tear ducts mimic emotion.
'Nearly there,' he says with each step.
The slow march proceeds
conjuring
muffled
drum
beats.

The details are finely observed. We can almost hear the old man's footsteps as they approach and then move away, sense the stubborn pride that keeps him going, share his faded memories of a military past.

In 'X & Y Reverie' Jennifer R. Shloming uses parallel Fibonacci stanzas to convey the contrast between dream and reality.

X & Y Reverie

In
the
evening
I retreat
inside my daydreams.
Finally my acting can cease.
Pretending you are not everything is exhausting.

Blanketed in darkness's comfort my heart lights up
where we at long last do converge –

a parallel plane,
limitless,
exists
for
us.

Jennifer Shloming writes of her choice of layout:

‘In a dream we can exist looking like ourselves and even acting like ourselves but without any constraints. It is an alternative me that will just never come to pass in reality, so parallel in that way. I wanted to show this difference (visually) - the alternative/parallel exists so closely but separately.’

The structure of a Fib poem need not only be defined by the number of syllables per line. A word count may be used instead, or a letter count, or, as in A. E. Weisgerber's 'Mary-Pat', a character and space count. Note the visual impact of this choice on the poem's shape, like a big C. The first and last lines correspond to 55, the 10th number in the Fibonacci sequence.

Mary-Pat

She was surprised and angered about another chemo round
The spot wasn't supposed to be any
kind of tumor, it was
a microscopic
stigmata
after
all
+,
I
I
am
not
about
to start
quitting. She
looked toward th'open
window where shadows glance off of
the metal screen, the sun-thrown darts of willow leaves

A browse through issues of *The Fib Review* will reveal many other strikingly creative variations of the Fib form by poets such as Kimmo Rosenthal, Ralph Stott and Tyson West. The journal's digital format allows poets to play with spacing and layout in ways that would not be effective within the constrained dimensions of the written page.

The possibilities, like the sequence itself, are endless.

Further reading

Marian Christie (2024) *Sky, Earth, Other*. Penteract Press
A collection of poems structured by the Fibonacci sequence.

Marcia Birken and Anne C. Coon (2008) *Discovering Patterns in Mathematics and Poetry*. Editions Rodopi

Inger Christensen (tr. Susanna Reid) (2000) *alphabet*. Bloodaxe Books

Sarah Glaz (2016) 'Poems structured by integer sequences', *Journal of Mathematics and the Arts*, 10:1-4, 44-52

Sarah Hart (2023) *Once Upon a Prime*. Mudlark 2023.

Greg Pincus (2006) *The Fib.* Available at:
http://gottabook.blogspot.com/2006/04/fib.html

Ron Silliman (1981, revised edition 2002) *Tjanting*. Salt

The Fib Review (online journal). Available at:
http://www.musepiepress.com/fibreview