|  |  |
| --- | --- |
| **The Rabbit Problem** |  |

In the year 1202, an Italian mathematician named Leonardo Fibonacci became interested in the reproduction of rabbits. He created an imaginary set of ideal conditions under which rabbits could breed, and posed the question, "How many pairs of rabbits will there be a year from now?" The ideal set of conditions was a follows:

1. You begin with one male rabbit and one female rabbit. These rabbits have just been born.  
2. A rabbit will reach sexual maturity after one month.  
3. The gestation period of a rabbit is one month.  
4. Once it has reached sexual maturity, a female rabbit will give birth every month.  
5. A female rabbit will always give birth to one male rabbit and one female rabbit.  
6. Rabbits never die.

So how many male/female rabbit pairs are there after one year (12 months)?

Newborn:



Mature:





give birth

give birth

give birth

give birth

mature

mature

mature

Figure out how many rabbits there will be in the next several months.

Complete the table below:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Month | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Pairs of Rabbits |  |  |  |  |  |  |  |  |  |  |  |

What pattern do you notice?

Write a rule to find out how many rabbits are in any given month, based on the number of rabbits from previous months. What is the START value?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |
| http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg | http://imaginativeicing.co.uk/store/files/images/products/c-Bunnies_jem.jpg |

|  |  |
| --- | --- |
| **The Rabbit Problem - Answer Key** |  |

In the year 1202, an Italian mathematician named Leonardo Fibonacci became interested in the reproduction of rabbits. He created an imaginary set of ideal conditions under which rabbits could breed, and posed the question, "How many pairs of rabbits will there be a year from now?" The ideal set of conditions was a follows:

1. You begin with one male rabbit and one female rabbit. These rabbits have just been born.  
2. A rabbit will reach sexual maturity after one month.  
3. The gestation period of a rabbit is one month.  
4. Once it has reached sexual maturity, a female rabbit will give birth every month.  
5. A female rabbit will always give birth to one male rabbit and one female rabbit.  
6. Rabbits never die.

So how many male/female rabbit pairs are there after one year (12 months)?

Newborn:



Mature:





give birth

give birth

give birth

give birth

mature

mature

mature

Figure out how many rabbits there will be in the next several months.

Complete the table below:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Month | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Pairs of Rabbits | 1 | 1 | 2 | 3 | 5 | 8 | 13 | 21 | 34 | 55 | 89 |

What pattern do you notice?

Each term is the sum of the previous two terms

Write a rule to find out how many rabbits are in any given month, based on the number of rabbits from previous months. What is the START value?

START (Month 0) = 1

START(Month 1) = 1

NEXT MONTH = CURRENT MONTH + PREVIOUS MONTH