1 Mapping numbers to Strings

Implement a method `String num(int value)` which, for $0 < value < 10$, returns the name of the number, otherwise returns `"??"`. This should be done twice, each time using one of the methods listed below:

1. A switch statement
2. An array of Strings

2 Fibonacci

The Fibonacci sequence is defined as $1, 1, 2, \ldots$ with $F(n) = F(n-1) + F(n-2)$.

1. Compute some more terms of the sequence to use for testing.
2. Write the method `int fib(int n)`
3. A "Desk check" is a manual (non-computerised) technique for checking the logic of an algorithm. The person performing the check effectively acts as the computer, using pen and paper to record results.[1] Desk check your implementation of `int fib(int n)`.

3 Ackermann — Extra question

The Ackermann-Péter function[2] is defined as follows:

$$A(m,n) = \begin{cases} n+1 & \text{if } m = 0 \\ A(m-1,1) & \text{if } m > 0 \text{ and } n = 0 \\ A(m-1, A(m,n-1)) & \text{if } m > 0 \text{ and } n > 0 \end{cases}$$

Implement the method `long ackermann(short m, short n)`.
Why does the function take `short`s as parameters but return `long`?

[1] https://sites.google.com/a/campioncollege.com/it_eveningschoool/problem-solving-and-programming/desk-check-guide
[2] https://en.wikipedia.org/wiki/Ackermann_function