

```
1 #include "FibonacciSequenceGenerator.h"
2 #include <limits>
3 #include <stdexcept>
4
5 // Constructor to set up a Fibonacci sequence
6 //sequence ID + prev 0 + cur 1 as required
7 FibonacciSequenceGenerator::FibonacciSequenceGenerator(const std::string& aID) noexcept
8     : fID(aID), fPrevious(0), fCurrent(1) {}
9
10 //Get sequence ID
11 const std::string& FibonacciSequenceGenerator::id() const noexcept
12 {
13     return fID;
14 }
15
16 //Get current Fibonacci number
17 const long long& FibonacciSequenceGenerator::operator*() const noexcept
18 {
19     return fCurrent;
20 }
21
22 //Type conversion to bool
23 FibonacciSequenceGenerator::operator bool() const noexcept
24 {
25     //if current positive + next number can be calculated (same as hasNext())
26     return fCurrent > 0 && std::numeric_limits<long long>::max() - fPrevious >=
        fCurrent;
27 }
28
29 //Reset sequence generator to first Fibonacci number
30 void FibonacciSequenceGenerator::reset() noexcept
31 {
32     fPrevious = 0;
33     fCurrent = 1;
34 }
35
36 //Tests if there is a next Fibonacci number
37 bool FibonacciSequenceGenerator::hasNext() const noexcept
38 {
39     return std::numeric_limits<long long>::max() - fPrevious >= fCurrent;
40 }
41
42 //next Fibonacci number
43 void FibonacciSequenceGenerator::next() noexcept
44 {
45     long long next = fCurrent + fPrevious;
46     if (next < fCurrent) {
47         //overflow assertion check
48         throw std::overflow_error("Overflow in Fibonacci number calculation");
49     }
50     fPrevious = fCurrent;
51     fCurrent = next;
52 }
53
```