

```
1 // COS30008
2 // Created by Nur E Siam
3
4 #include "FibonacciSequenceGenerator.h"
5 #include <cassert>
6
7 // Constructor initializes the Fibonacci sequence generator
8 FibonacciSequenceGenerator::FibonacciSequenceGenerator(const std::string& aID) noexcept
9     : fID(aID), fPrevious(0), fCurrent(1) {}
10
11 // Getter for the generator ID
12 const std::string& FibonacciSequenceGenerator::id() const noexcept {
13     return fID;
14 }
15
16 // Dereference operator overload to retrieve the current Fibonacci number
17 const long long& FibonacciSequenceGenerator::operator*() const noexcept {
18     return fCurrent;
19 }
20
21 // Conversion operator to bool to check if there are more Fibonacci numbers
22 FibonacciSequenceGenerator::operator bool() const noexcept {
23     return hasNext();
24 }
25
26 // Reset the generator to the initial state
27 void FibonacciSequenceGenerator::reset() noexcept {
28     fPrevious = 0;
29     fCurrent = 1;
30 }
31
32 // Check if there are more Fibonacci numbers in the sequence
33 bool FibonacciSequenceGenerator::hasNext() const noexcept {
34     return fCurrent <= LLONG_MAX - fPrevious;
35 }
36
37 // Generate the next Fibonacci number in the sequence
38 void FibonacciSequenceGenerator::next() noexcept {
39     long long temp = fCurrent;
40     fCurrent += fPrevious;
41     fPrevious = temp;
42 }
43
```