

```
// Erzeugung von Fibonacci-Zahlen
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```
#include <iostream>
```

```
#include <iomanip>
```

```
#include <vector>
```

```
using namespace std;
```

```
// Zahlen werden mittels vector <int> dargestellt.
```

```
typedef vector<int> zahl;
```

```
void print (vector<int> s) { // printzahl  
    cout << s [s.size() - 1];  
    for (int k = s.size()-2; k >= 0; --k) {  
        cout << "."  
            << setfill ('0')  
            << setw (3)  
            << s [k];  
    }  
} //print
```

```
vector <int> add (vector<int> a, vector<int> b) {  
    // a.size() > 0 && b.size () > 0  
    if (a.size() < b.size()) { // vertausche  
        vector <int> h = a;  
        a = b;  
        b = h;  
    }  
    int ueber = 0;  
    for (int i = 0; i < b.size(); ++i) {  
        a [i] += (b [i] + ueber);  
        ueber = a [i] / 1000;  
        a [i] %= 1000;  
    }  
}
```

```
if ((ueber > 0) && (a.size() == b.size())) {  
    a.push_back (ueber);  
} else if ((ueber > 0) && (a.size () > b.size())) {  
    for (int i = b.size(); i < a.size(); ++i) {  
        a [i] += ueber;  
        ueber = a [i] / 1000;  
        a [i] %= 1000;  
    }  
    if (ueber > 0)  
        a.push_back (ueber);  
}  
return a;  
} //add
```

```
zahl Fibonacci (unsigned n) {  
    zahl erg; erg.push_back (0);  
    if (n == 0)  
        ;  
    else {  
        zahl f0; f0.push_back (0);  
        zahl f1; f1.push_back (1);  
        zahl fneu; fneu.push_back (0);  
        for (unsigned index = 2; index < n+1; ++index) {  
            fneu = add (f0, f1);  
            f0 = f1;  
            f1 = fneu;  
        }  
        erg = fneu;  
    }  
return erg;  
} //Fibonacci
```

```
int main () {  
    for (int i = 1; i < 160; i++) {  
        zahl z = Fibonacci (i);  
        cout << setfill ( ' ') << setw (4) << i  
            << ". Fibonacci-Zahl = ";  
        print (z);  
        cout << endl;  
    }  
    return 0;  
} //main
```

/* Teilergebnis:

- 1. Fibonacci-Zahl = 0**
- 2. Fibonacci-Zahl = 1**
- 3. Fibonacci-Zahl = 2**

140. Fibonacci-Zahl = 81.055.900.096.023.504.197.206.408.605

**141. Fibonacci-Zahl =
131.151.201.344.081.895.336.534.324.866**

**150. Fibonacci-Zahl =
9.969.216.677.189.303.386.214.405.760.200**

**159. Fibonacci-Zahl =
757.791.618.667.731.139.247.631.372.100.066**

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