

PROJECT 1, FIBONACCI

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First I will print out the code used for the projects. A table of the results is located on the last page. The project FiboR has the following code:

```
#include <iostream>
#include <time.h>

// This program uses a recursive function
// to calculate a number in the Fibonacci sequence

using namespace std;

unsigned long long FiboR(unsigned long long FibIndex)
{
    if (FibIndex < 2)
        return FibIndex;
    else
        return FiboR(FibIndex - 1) + FiboR(FibIndex - 2);
}

int main()
{
    clock_t t;
    t = clock();

    unsigned long long Index = 25; // Type in index of desired Fibonacci number here

    cout << "Fibonacci number is: " << FiboR(Index) << endl;

    t = clock() - t;

    cout << "It took " << t << " clicks, or " << t * .001;
    cout << " seconds to compute." << endl;
    return 0;
}
```

The project FiboNR has the following code:

```
#include <iostream>
#include <time.h>

using namespace std;

unsigned long long FiboNR(int n)
{
    unsigned long long F0 = 0;
    unsigned long long F1 = 1;

    unsigned long long Fn = 0;

    for (int i=2; i <= n; i++)
    {
        Fn = F0 + F1;

        F0 = F1;
        F1 = Fn;
    }

    return Fn;
}

int main()
{
    clock_t t;
    t = clock();

    int n = 60; // Type in index of desired Fibonacci number here

    cout << "Fibonacci number is " << FiboNR(n) << endl;

    t = clock() - t;

    cout << "It took " << t << " clicks, or " << t * .001;
    cout << " seconds to compute." << endl;

    return 0;
}
```

Index	FiboR (seconds)	FiboNR (seconds)	Fibo-value
1	0.001	0.001	1
5	0.001	0.001	5
10	0.001	0.001	55
15	0.001	0.001	610
20	0.001	0.001	6765
25	0.003	0.001	75025
30	0.017	0.001	832040
35	0.171	0.001	9227465
40	1.797	0.001	102334155
45	9.935	0.001	1134903170
50	228.146	0.001	12586269025
55	too long	0.001	139583862445
60	too long	0.002	154808755920