# Project 1: Vishruth Reddy

## Problem 1

```
Enter the value of n: 47
2971215073 1836311903 1134903170 701408733 433494437 267914296 165580141 102334155 63245986 39088169 24157817 14
930352 9227465 5702887 3524578 2178309 1346269 832040 514229 317811 196418 121393 75025 46368 28657 17711 10946
6765 4181 2584 1597 987 610 377 233 144 89 55 34 21 13 8 5 3 2 1 1

Recursive Fibonacci: 54 seconds

1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025 121393 196418 3
17811 514229 832040 1346269 2178309 3524578 5702887 9227465 14930352 24157817 39088169 63245986 102334155 165580
141 267914296 433494437 701408733 1134903170 1836311903 2971215073

Iterative Fibonacci: 0 seconds
```

```
Enter the value of n: 48
4807526976 2971215073 1836311903

Recursive Fibonacci: 66 seconds

1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025 121393 196418 3
17811 514229 832040 1346269 2178309 3524578 5702887 9227465 14930352 24157817 39088169 63245986 102334155 165580
141 267914296 433494437 701408733 1134903170 1836311903 2971215073 4807526976

Iterative Fibonacci: 0 seconds
```

A. The largest number that the recursive algorithm can accept as its argument and still compute the answer within 60 seconds: **47**
B. Time it takes the iterative algorithm to compute the answer in A: **0 seconds**

## Problem 2

Test Case 1:

```
Enter the size of the binary array: 15
Enter the elements of the binary array: 0 0 1 0 0 1 1 0 1 0 0 0 0 0 1
First Index: 1
Last Index: 8
```

Test Case 2:

```
Enter the size of the binary array: 12
Enter the elements of the binary array: 1 0 1 0 0 1 0 1 1 1 0 0
First Index: 0
Last Index: 11
```

Test Case 3:

```
Enter the size of the binary array: 30
Enter the elements of the binary array: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
First Index: 28
Last Index: 29
```

Test Case 4:

```
Enter the size of the binary array: 18
Enter the elements of the binary array: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
No balanced Subset
```

## Problem 3

A. Results of the Test Cases

Test Case 1:

```
vish@Vishruths-MacBook-Pro Quiz 1 % g++ Problem3.cpp -std=c++17
vish@Vishruths-MacBook-Pro Quiz 1 % ./a.out
-2 -5 6 -2 -3 1 5 -6
Maximum Contiguous Sum: 7
First Index 3
Last Index 7
Time measured: 0.000041 seconds.
```

Test Case 2:

```
vish@Vishruths-MacBook-Pro Quiz 1 % g++ Problem3.cpp -std=c++17
vish@Vishruths-MacBook-Pro Quiz 1 % ./a.out
1 2 3 4 5 6 7 8 9 -10 -100 10 9 8 7 6 5 4 3 2 1
Maximum Contiguous Sum: 55
First Index 12
Last Index 21
Time measured: 0.000096 seconds.
```

B. Time Complexity Plot