CS2263 Assignment 1

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Fibonacci Primes

1. A Fibonacci prime is a number in the Fibonacci Sequence that is also prime, meaning that it is only divisible by 1 and itself. The Fibonacci numbers can be defined as: u\_1 = u\_2 = 1 and u\_{n+1} = u\_n + u\_{n-1} where (n > 2). The known Fibonacci primes are u\_n with n = 3, 4, 5, 7, 11, 13, 17, 23, 29, 43, 47, 83, 131, 137, 359, 431, 433, 449, 509, 569, 571, 2971, 4723, 5387, 9311, 9677, 14431, 25561, 30757, 35999, and 81839. It is thought that there are infinitely many Fibonacci primes, however that theory has not been proven [1]. Another thing known about Fibonacci primes is that for a Fibonacci prime F\_n the index n must also be prime (excluding 3), the converse is not true [2].

[1] <https://primes.utm.edu/glossary/page.php?sort=FibonacciPrime>

[2] <https://mathworld.wolfram.com/FibonacciPrime.html>

1. Isprime.c

//return 1 if prime, else 0

int isPrime(int val)

{

int ret=1;

int i;

for(i=2; i<=val/2; ++i)

{

if(val % i == 0){

ret=0;

break;

}

}

if(ret == 0 || val == 1)

return 0;

else

return 1;

}

1. main.c

#include "isprime.c"

int main(void)

{

int iVal=0;

int result=0;

printf("Enter a positive integer: ");

scanf("%d", &iVal);

if(iVal < 1){

printf("Invalid Input!\n");

return 0;

}

result = isPrime(iVal);

if(result == 1)

printf("Result: Prime\n");

else

printf("Result: Non-prime\n");

return EXIT\_SUCCESS;

}

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1. isfib.c

//return 1 if yes, else 0

int isFib(int val)

{

int a=0;

int b=1;

if(val==a || val==b)

return 1;

int nextNum = 1;

while(nextNum<=val)

{

if(val==nextNum)

return 1;

a=b;

b=nextNum;

nextNum=a+b;

}

return 0;

}

1. fibtest.c

int main(void)

{

int iVal;

int fibRes=0;

printf("Enter an integer >= 0: ");

scanf("%d", &iVal);

fibRes = isFib(iVal);

if(fibRes == 1)

printf("Result: Fibonacci Number\n");

else

printf("Result: Not a Fibonacci Number\n");

return EXIT\_SUCCESS;

}

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1. findprimefibs.c

void findPrimeFibs(int min, int max)

{

int count = min;

while(count <= max)

{

if(isFib(count) == 1 && isPrime(count) == 1)

printf("%d\n", count);

count++;

}

}

int main(void)

{

int val1;

int val2;

printf("Enter the smallest number of your range: ");

scanf("%d", &val1);

printf("Enter the largest number of your range: ");

scanf("%d", &val2);

findPrimeFibs(val1,val2);

return EXIT\_SUCCESS;

}

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Directory Listing