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ASSIGNMENT 1

Part a:

A Fibonacci prime is a Fibonacci number that is also a prime number. The number of Fibonacci primes could be infinite. The largest known Fibonacci prime is F_{104911} which has 21925 digits.

https://large-numbers.fandom.com/wiki/Fibonacci_prime

Part b:

```c
#include <stdio.h>

int isPrime(int num)
{
    int i;
    int var = 0;

    for(i = 2; i <= num/2; i++)
    {
        if(num % i ==0)
        {
            var = 1;
            break;
        }
    }

    if(num == 1)
    {
        printf("1 is neither prime, not composite");
    }
    else
    {
        if(var == 0)
        {
            printf("1");
        }
        else
        {
            printf("0");
        }
    }

}
```

Part c:

isPrime.h:

```c
#include <stdio.h>
int isPrime(int num)
{
    int i;
    int var = 0;

    for(i = 2; i <= num/2; i++)
    {
        if(num % i ==0)
        {
            var = 1;
            break;
        }
    }

    if(num == 1)
    {
        printf("1 is neither prime, not composite\n");
    }

    else
    {
        if(var == 0)
        {
            printf("The number is prime\n");
        }
        else
        {
            printf("The number is not prime\n");
        }
    }

}
```

testingIsPrime.c:

```c
#include "isPrime.h"
#include <stdio.h>
#include <stdlib.h>


int main()
{
    int number;

    printf("Enter a number:");
    scanf("%d", &number);

    isPrime(number);
    return 0;
}
```

Output:

```
[ksrivast@id415m11 ~/Desktop]$ gcc testingIsPrime.c isPrime.h -o testing
[ksrivast@id415m11 ~/Desktop]$ ./testing
Enter a number:1
1 is neither prime, not composite
[ksrivast@id415m11 ~/Desktop]$ ./testing
Enter a number:66
The number is not prime
[ksrivast@id415m11 ~/Desktop]$ ./testing
Enter a number:13
The number is prime
```

Part d:

```c
#include <stdio.h>

int isFib(int num)
{
    int num1;
    int num2;
    int num3;

    if((num == 0) || (num == 1))
    {
        printf("1");
    }

    else
    {
        num1 = 0;
        num2 = 1;
        num3 = num1+num2;

        while(num3 < num)
        {
            num1 = num2;
            num2 = num3;
            num3 = num1+num2;
        }

        if(num3 == num)
        {
            printf("1");
        }

        else
        {
            printf("0");
        }
    }
}
```

Part e:

isFib.h

```c
#include <stdio.h>

int isFib(int num)
{
    int num1;
    int num2;
    int num3;

    if((num == 0) || (num == 1))
    {
        printf("The number is a fibonacci number \n");
    }

    else
    {
        num1 = 0;
        num2 = 1;
        num3 = num1+num2;

        while(num3 < num)
        {
            num1 = num2;
            num2 = num3;
            num3 = num1+num2;
        }

        if(num3 == num)
        {
            printf("The number is a fibonacci number \n");
        }

        else
        {
            printf("The number is not a fibonacci number \n");
        }
    }
}
```

testingisFib.c

```c
#include "isFib.h"
#include <stdio.h>

int main()
{
    int number;

    printf("Enter a number: ");
    scanf("%d", &number);

    isFib(number);
    return 0;
}
```

Output:

```
[ksrivast@id415m11 ~/Desktop]$ gcc testingIsFib.c isFib.h -o testingFib
[ksrivast@id415m11 ~/Desktop]$ ./testingFib
Enter a number: 4
The number is not a fibonacci number
[ksrivast@id415m11 ~/Desktop]$ ./testingFib
Enter a number: 55
The number is a fibonacci number
[ksrivast@id415m11 ~/Desktop]$ ./testingFib
Enter a number: 0
The number is a fibonacci number
[ksrivast@id415m11 ~/Desktop]$ ./testingFib
Enter a number: 79
The number is not a fibonacci number
```

Part f:

isFib.h

```c
#include <stdio.h>

int isFib(int num)
{
    int num1;
    int num2;
    int num3;

    if((num == 0) || (num == 1))
    {
        return 0;
        //printf("The number is a fibonacci number \n");
    }

    else
    {
        num1 = 0;
        num2 = 1;
        num3 = num1+num2;

        while(num3 < num)
        {
            num1 = num2;
            num2 = num3;
            num3 = num1+num2;
        }

        if(num3 == num)
        {
            return 0;
            //printf("The number is a fibonacci number \n");
        }

        else
        {
            //printf("The number is not a fibonacci number \n");
        }
    }
}
```

isPrime.h

```c
#include <stdio.h>
int isPrime(int num)
{
    int i;
    int var = 0;

    for(i = 2; i <= num/2; i++)
    {
        if(num % i ==0)
        {
            var = 1;
            break;
        }
    }

    if(num == 1)
    {
        //printf("1 is neither prime, not composite\n");
    }

    else
    {
        if(var == 0)
        {
            return 1;
            //printf("The number is prime\n");
        }
        else
        {
            //printf("The number is not prime\n");
        }
    }

}
```

fibPrimes.c

```c
#include "isFib.h"
#include "isPrime.h"
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int x1;
    int x2;
    int i;

    printf("Enter 2 integers: \n");
    scanf("%d%d", &x1, &x2);
    printf("\n");

    printf("Fibonacci primes are: \n");
    for(i = x1; i <= x2; i++)
    {
        if(isFib(i) == 0)
        {
            if(isPrime(i) == 1)
            {
                printf("%d\n", i);
            }
        }
    }
}
```

Output:

```
[ksrivast@id415m11 Assignment1]$ gcc fibPrimes.c isFib.h isPrime.h -o testFibPrime
[ksrivast@id415m11 Assignment1]$ ./testFibPrime
Enter 2 integers:
1
100

Fibonacci primes are:
2
3
5
13
89
[ksrivast@id415m11 Assignment1]$ ./testFibPrime
Enter 2 integers:
1597
1597

Fibonacci primes are:
1597
```