CS2263 Assignment 1 – Isaac Shoebottom

A:

A Fibonacci prime is quite simply, a number from the Fibonacci sequence that is also prime. There is a list of known Fibonacci primes (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 though that there is an infinite number of them, but it has not been proven. (Sources: https://primes.utm.edu/glossary/xpage/FibonacciPrime.html, https://mathworld.wolfram.com/FibonacciPrime.html)

B:

```c
#include <math.h>
int isPrime(int i) {
    if (i < 2) {
        return 0;
    }
    int j, k = sqrt(i);
    for(j = 2; j <= k; j++) {
        if (i % j == 0) {
            return 0;
        }
    }
    return 1;
}
```

C:

```c
#include <stdio.h>

int isPrime(int i);

int main() {
    int i;
    printf("Please enter a number to check if prime: ");
    scanf("%d", &i);
    if(isPrime(i) == 1){
        printf("Your number is prime");
    }
    else {
        printf("Your number is not prime");
    }
}
```

```
[23:21:38] ~\..\..\..\..\1 on >  gcc .\testingPrimes.c .\isPrime.c -o testPrime
[23:22:12] ~\..\..\..\..\1 on >  .\testPrime.exe
Please enter a number to check if prime: 2
Your number is prime
[23:22:37] ~\..\..\..\..\1 on >  .\testPrime.exe
Please enter a number to check if prime: 1
Your number is not prime
[23:22:39] ~\..\..\..\..\1 on >  .\testPrime.exe
Please enter a number to check if prime: 12321312
Your number is not prime
[23:22:41] ~\..\..\..\..\1 on >  .\testPrime.exe
Please enter a number to check if prime: 11
Your number is prime
[23:22:44] ~\..\..\..\..\1 on >
```

D:

```c
#include <math.h>
int isPerfectSquare(int i) {
    int s = sqrt(i);
    return (s*s == i);
}

int isFib(int i) {
    return isPerfectSquare(5*i*i+4) || isPerfectSquare(5*i*i -4);
}
```

E:

```c
#include <stdio.h>

int isFib(int i);

int main() {
    int i;
    printf("Please enter a number to check if part of fibonacci sequence: ");
    scanf("%d", &i);
    if(isFib(i) == 1){
        printf("Your number is part of the fibonacci sequence");
    }
    else {
        printf("Your number is not part of the fibonacci sequence");
    }
}
```

```
[23:24:49] ~\..\..\..\..\1 on >  gcc .\testingFib.c .\isFib.c -o testFib
[23:25:08] ~\..\..\..\..\1 on >  .\testFib.exe
Please enter a number to check if part of fibbonacci sequence: 0
Your number is part of the fibbonacci sequence
[23:25:18] ~\..\..\..\..\1 on >  .\testFib.exe
Please enter a number to check if part of fibbonacci sequence: 2
Your number is part of the fibbonacci sequence
[23:25:19] ~\..\..\..\..\1 on >  .\testFib.exe
Please enter a number to check if part of fibbonacci sequence: 56
Your number is not part of the fibbonacci sequence
[23:25:22] ~\..\..\..\..\1 on >  .\testFib.exe
Please enter a number to check if part of fibbonacci sequence: 5
Your number is part of the fibbonacci sequence
[23:25:29] ~\..\..\..\..\1 on >
```

F:

```c
#include <stdio.h>

int isFib (int i);
int isPrime(int i);

int main() {
    int x1, x2;
    printf("Please enter min value: ");
    scanf("%d", &x1);
    printf("Please enter max value: ");
    scanf("%d", &x2);

    int i;
    for(i = x1; i <= x2; i++) {
        if ((isFib(i) == 1) && (isPrime(i) == 1)) {
            printf("%d ", i);
        }
    }
    printf("\n");

    return 0;
}
```

```
[23:27:50] ~\..\..\..\..\1 on ❯  gcc .\isPrime.c .\isFib.c .\isFibPrime.c -o isFibPrime
[23:28:12] ~\..\..\..\..\1 on ❯  .\isFibPrime.exe
Please enter min value: 10
Please enter max value: 100
13 89
[23:28:24] ~\..\..\..\..\1 on ❯  .\isFibPrime.exe
Please enter min value: 1597
Please enter max value: 1597
1597
[23:28:32] ~\..\..\..\..\1 on ❯
```