THE UNIVERSITY OF THE WEST INDIES
Department of Computing
COMP1126–Introduction to Computing I

Lab 2

1. The roots of a quadratic equation ax^2+bx+c are given by the quadratic formula

$$root1 = \frac{-b+\sqrt{b^2-4ac}}{2a} \qquad root2 = \frac{-b-\sqrt{b^2-4ac}}{2a}$$

Write a function `quadratic` in python which returns the greater of the two roots. However, the root is returned when the discriminant (i.e. b^2-4ac) is positive when it is negative print a message that there are no real roots.

e.g.

```
quadRoots(15,3,6) -> "No real roots"
quadRoots(6,23,20) -> -1.3333333333333333
```

2. Fermat's Last Theorem says that there are no integers a, b and c such that

$a^n+b^n=c^n$ for any values of n greater than 2.

Write a function `check_fermat` that takes four parameters a,b,c & n and checks if Fermat's theorem holds. If n is greater than 2 and it turns out that $a^n+b^n=c^n$ then print "I made a discovery - Fermat was wrong" and return False, otherwise return True. For n equal to 1 or 2 return True if the Fermat's theorem holds and False otherwise. For values of n less than equal to 0 print an error message.

e.g.

```
check_fermat(3,4,8,1) -> False
check_fermat(3,4,5,2) -> True
check_fermat(3,4,7,2) -> False
check_fermat(3,4,5,3) -> True
```

3. An integer greater than 1 is said to be prime if it divisible by only 1 and itself. For example 2,3,5,7 are prime numbers, but 4, 6, 8 and 9 are not. Write a function `isPrime` that determines whether a number is prime or not. The function takes a parameter n and checks if there exists a number from 2 to n that n is divisible by [Hint: you can use `for` loops]. If n is divisible by such a number then it is not a prime number and false must be returned. Return true if the number is a prime number. Remember that 1 is not a prime number.

e.g.

```
isPrime(5) -> True
```

4. Use `isPrime` function in a function `primes` that take two numbers as parameters and prints all the prime numbers between those two numbers (e.g. 2 and 10). Ensure that `isPrime` is local function and can only be accessed by function `primes`.

   e.g.

```
primes(2,10) -> 2,3,5,7
isPrime(3) -> syntax error
```