Python – Numbers

**Purpose**

This lab was designed to teach you how to use iteration to implement basic algorithms to solve various mathematical functions.

**Description**

Implement the 10 functions in numbers.py. You’re not allowed to use Strings or any of Python’s built-in functions. For example, you must implement the power(base, exponent) function and you are not allowed to use \*\* or call the function from the math module.

**Program Shell**

numbers.py is provided

--------------------------------------------------------------------------

Testing digits(num) function!

1 2 3 4 5 6 7 8 9

2 4 6 8 1 0

1 1 1 1 2 2 2 3 3 3 4 4 4 5 5 5 6 6 6 7 7 7 8 8 9 9 9

--------------------------------------------------------------------------

Testing gcd(a, b) function!

gcd(10, 5) = 5

gcd(128, 96) = 32

gcd(90, 20) = 10

gcd(1203, 18) = 3

gcd(-13, 48) = 1

gcd(50, 75) = 25

--------------------------------------------------------------------------

Testing lcm(a, b) function!

lcm(10, 5) = 10

lcm(128, 96) = 384

lcm(90, 20) = 180

lcm(1203, 18) = 7218

lcm(-13, 48) = 624

lcm(50, 75) = 150

--------------------------------------------------------------------------

Testing is\_prime(num) function!

2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97

--------------------------------------------------------------------------

Testing print\_4\_perfect\_numbers(n) function!

6 28 496 8128

--------------------------------------------------------------------------

Testing is\_odious(num) function!

1 2 4 7 8 11 13 14 16 19 21 22 25 26 28 31 32 35 37 38

--------------------------------------------------------------------------

Testing is\_evil(num) function!

0 3 5 6 9 10 12 15 17 18 20 23 24 27 29 30 33 34 36 39

--------------------------------------------------------------------------

Testing power(base, exp) function!

power(3, 5) = 243

power(2, 10) = 1024

power(4, -3) = 0.015625

power(7, -2) = 0.02040816326530612

power(8, 5) = 32768

power(10, 9) = 1000000000

power(2, 32) = 4294967296

power(2, 64) = 18446744073709551616

--------------------------------------------------------------------------

Testing prime\_factorization(num) function!

2 == 2

3 == 3

4 == 2^2

5 == 5

6 == 2\*3

7 == 7

8 == 2^3

9 == 3^2

10 == 2\*5

11 == 11

12 == 2^2\*3

13 == 13

14 == 2\*7

15 == 3\*5

16 == 2^4

17 == 17

18 == 2\*3^2

19 == 19

20 == 2^2\*5

21 == 3\*7

22 == 2\*11

23 == 23

24 == 2^3\*3

25 == 5^2

26 == 2\*13

27 == 3^3

28 == 2^2\*7

29 == 29

30 == 2\*3\*5

31 == 31

32 == 2^5

33 == 3\*11

34 == 2\*17

35 == 5\*7

36 == 2^2\*3^2

37 == 37

38 == 2\*19

39 == 3\*13

40 == 2^3\*5

41 == 41

42 == 2\*3\*7

43 == 43

44 == 2^2\*11

45 == 3^2\*5

46 == 2\*23

47 == 47

48 == 2^4\*3

49 == 7^2

google == 2^100\*5^100