Program 4: Project Euler Problems 5 through 8

Problem 5 (https://projecteuler.net/problem=5)
2,520 is the smallest positive number that is evenly divisible by all of the numbers from 1 to 10. What is the smallest positive number that is evenly divisible by all of the numbers from 1 to 20?

Problem 6 (https://projecteuler.net/problem=6)
The sum of the squares of the first ten natural numbers is:

$$1^2+2^2+\ldots+10^2=385$$

The square of the sum of the first ten natural numbers is:

$$(1+2+\ldots+10)^2=55^2=3025$$

The difference between the square of the sum and the sum of the squares of the first ten natural numbers is 3025 – 385 = 2640. Find the difference between the square of the sum and the sum of the squares of the first **one hundred** natural numbers.

Problem 7 (https://projecteuler.net/problem=7)
By listing the first six prime numbers (2, 3, 5, 7, 11, 13), we can see that the sixth prime is 13. What is the 10,001st prime number?

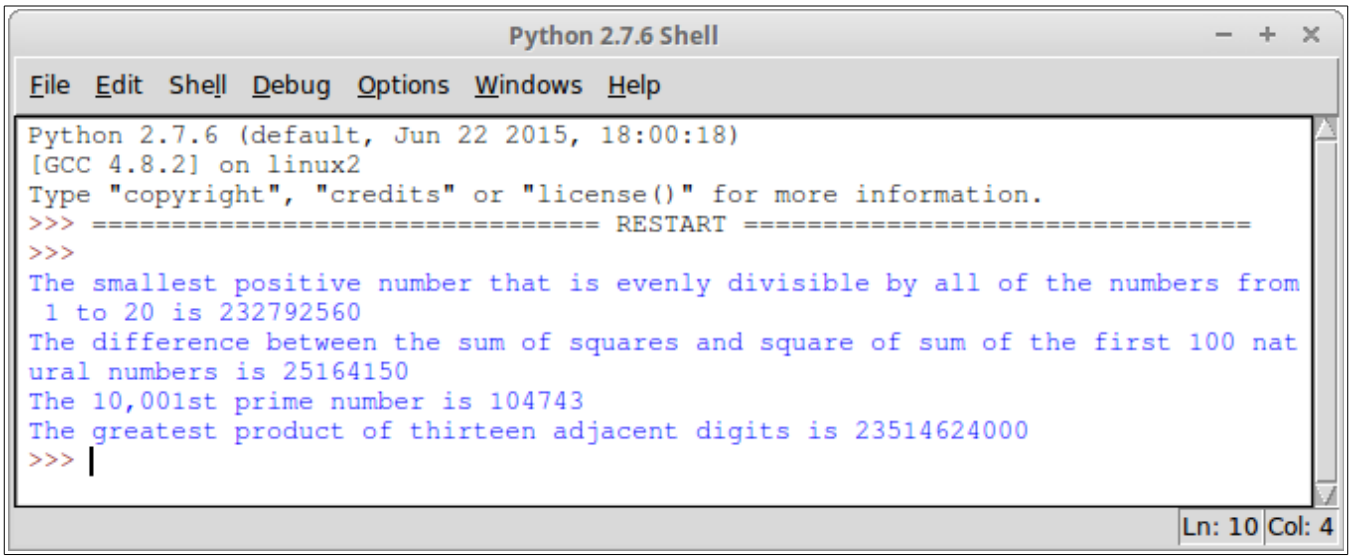
Problem 8 (https://projecteuler.net/problem=8)
The greatest product of four adjacent digits in the following 1000-digit number is 5832:

```
73167176531330624919225119674426574742355349194934
96983520312774506326239578318016984801869478851843
85861560789112949495459501737958331952853208805511
12540698747158523863050715693290963295227443043557
66896648950445244523161731856403098711121722383113
62229893423380308135336276614282806444486645238749
30358907296290491560440772390713810515859307960866
70172427121883998797908792274921901699720888093776
65727333001053367881220235421809751254540594752243
52584907711670556013604839586446706324415722155397
53697817977846174064955149290862569321978468622482
83972241375657056057490261407972968652414535100474
82166370484403199890008895243450658541227588666881
16427171479924442928230863465674813919123162824586
17866458359124566529476545682848912883142607690042
24219022671055626321111109370544217506941658960408
07198403850962455444362981230987879927244284909188
84580156166097919133875499200524063689912560717606
05886116467109405077541002256983155200055935729725
71636269561882670428252483600823257530420752963450
```

What is the greatest product of **thirteen** adjacent digits in the 1000-digit number?

Again, the Project Euler web site can be accessed at: https://projecteuler.net/, and the numeric solutions can be found at: https://code.google.com/p/projecteuler-solutions/wiki/ProjectEulerSolutions.

Your task is to write a **single** Python program that solves **all four** problems. Here is my output in IDLE:



Homework: Project Euler Problems 5 through 8

Write a **single** Python program that correctly calculates the numeric solutions to **all four** Project Euler problems 5 through 8.

Make sure to put an appropriate header at the top of your program and to appropriately comment your source code as necessary. A template that you can choose to use as a starting point will be provided to you. **Only submit your source code (i.e., a single `.py` file).**