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**CMP 321 - Programming languages Laboratory**

**Lab 7**

**Objectives**

* Make use of Python specific features
* Define functions with iterators and generators

**Important Notes:**

* **Please explore and make use of Python features where possible. Code that does not follow this note will be penalized.**

**Exercise 1:**

Write a Python generator function that counts infinitely i.e., that yields 0, 1, 2, 3, … In other words the first function call returns 0, the second call returns 1, etc.

Nowimplement the standard enumerate function using your count function and zip.

**Exercise 2:**

Make the Polygon class from Lab4 Ex1 iterable. The following testing code should print each point in the polygon.

p= Polygon()

p.setPoint(Point('A',0,50))

p.setPoint(Point('B',300,150))

p.setPoint(Point('C',200,100))

for x in p: print(x)

**Exercise 3:**

**Part (a):**

1. Write a Python *function* that checks if positive integer *n* is a prime. Recall that *n* is a prime if it is divisible only by 1 and itself, hence *not* divisible by any integer in the range from 2 to *sqrt(n),* both inclusive.
2. Write a prime number *generator*, using the above function. By default it should generate (infinitely) *all* primes. If given a value as argument, it should generate (infinitely) all primes larger than this value.
3. Use your generator and a for loop to print the first 20 primes.

**Part (b):**

1. Use list comprehension to create a list of the next 20 primes.
2. Use islice() to create a list of the first 20 primes larger than 1 million.
3. Use a generator expression to create an iterator that would produce the first 100 primes larger than 1 million, then use a for loop and this iterator to print the values.
4. Use the above iterator to create a list of the first 100 primes larger than 1 million for which the last two digits are identical.
5. Create a Primes iterator class equivalent to your generator in (2) and use it with islice() to create a list of the first 20 primes larger than 1 million.