Reading:

- Chapter 11
  - 563 - 578
- Chapter 12
  - 659-676

- Write code that will calculate all of the prime numbers less than $N > 0$.
- Write code that will write all of the prime factors of all integers less than $N > 0$.
- Write a function which will take in an integer and give the sum of all of the digits. *For example:* If $X = 1632$, then the functions should return $1 + 6 + 3 + 2 = 12$.
- `https://projecteuler.net/problem=3`
- `https://projecteuler.net/problem=5`
- `https://projecteuler.net/problem=27`
- `https://projecteuler.net/problem=47`

For all of the problems below do not only write the code for the classes but a series of tests to determine any possible bugs.

- Write code to implement a doubly linked list. `https://en.wikipedia.org/wiki/Doubly_linked_list`
- For two matrices of size $m \times n$ and $n \times p$, write a function which will calculate the product of these matrices.
- On the unit square you want to move from the points $s = (0, 0)$ to $f = (1, 1)$, you can only move by hopping from point to point of points in $X \subset [0, 1] \times [0, 1]$ which is finite. If the points in X are generated according to a uniform distribution on the unit square and we can only jump $r > 0$ far, determine the probability of being able to jump from s to f if $|X| = n$ and can only jump $j > 0$ times.
