Programming 1

1. **Exercise**
   Write a Python program to create a set and iteration over it. Add and remove member(s) in a set. Create an intersection/union/difference/symmetric difference of sets

2. **Exercise**
   Roulette Results. In Roulette, each spin of the wheel has a number of attributes like even-ness, low-ness, red-ness, etc. You can bet on any of these attributes. The `wheel` will be a set of the numbers 0 to 36, and append the string "00" to this set. If the attribute on which you placed bet is in the set of attributes for the number, you win. Define 6 sets:

   - If the spin is non-zero and `spin % 2 != 0`, add the spin to the `odd` **`set`**.
   - If the spin is non-zero and it's in the `redNumbers` **`set`**, add the spin to the `red` **`set`**.
   - If the spin is If the spin is non-zero and `spin % 2 == 0`, add the spin to the `even` **`set`**.
   - non-zero and it's not in the `redNumbers` **`set`**, add the value to the `black` **`set`**.
   - If the spin is non-zero and `spin <= 18`, add the value to the `low` **`set`**.
   - If the spin is non-zero and `spin > 18`, add the value to the `high` **`set`**.

   redNumbers= set([1,3,5,7,9,12,14,16,18,19,21,23,25,27,30,32,34,36])

   Each round involves picking a random spin with something like `random.choice( list(wheel) )`. You can then see which set the spin belongs to. If the spin belongs to a set on which you've bet, the spin is a winner, otherwise it's a loser.

3. **Exercise**

   Sieve of Eratosthenes. Look at Sieve of Eratosthenes.

   1. **Initialize**
      Create a set, `prime` which has integers between 2 and 5000.
      Set $p \leftarrow 2$
   2. **Iterate**. While $2 \leq p < 5000$:
      Find Next Prime. while `p` is not in `prime` and `2 ≤ p < 5000`:
      Increment `p` by 1.
      Remove Multiples. At this point, `p` is prime.
      Set `k ← p + p`
      while $k < 5000$:
      Remove `k` from the `set prime`
      `k ← k + p`
      Next `p`. Increment `p` by 1.
   3. **Report**.
      At this point, the set `prime` has the prime numbers. We can return the set.