# Matlab Tutorial – Week 1

1. Create a vector x with 10 elements as following:
   a) 2, 4, 6, 8, ...
   b) 10, 8, 6, 4, 2, 0, -2, -4
   c) 1, 1/2, 1/3, 1/4, 1/5, ...
   d) 0, 1/2, 2/3, 3/4, 4/5, ...

2. Let x = [2 5 1 6].
   a) Add 16 to each element
   b) Add 3 to just the odd-index elements
   c) Compute the square root of each element

3. Create an M-by-N array of random numbers (use rand). Move through the array, element by element, and set any value that is less than 0.2 to 0 and any value that is greater than (or equal to) 0.2 to 1.

4. Write a function taking M and N as inputs (using loop statement) does the same thing as in q.3.

5. Given x = [3 15 9 12 -1 0 -12 9 6 1], provide the command(s) that will
   a) Set the values of x that are positive to zero
   b) Multiply the values of x that are even by 5
   c) Extract the values of x that are greater than 10 into a vector called y

6. Plot the expression (determined in modeling the growth of the US population)

$$P(t) = 197{,}273{,}000/(1 + e^{-0.0313(t - 1913.25)})$$

where t is the date, in years AD, using t = 1790 to 2000. What population is predicted in the year 2020?