

Basic:

1. Suppose we have a list $l = [1, 20, 40, 30, 2, 5, 4]$. Write a for loop to determine if this list contains the number 30.
2. Calculate the mean, max, min, median, and variance of a set of numbers in a list l (use the above list).
3. Suppose you have a list of DNA sequences. What is the average sequence length of the list?
4. Suppose the list contains the organism name followed by the sequence. What is the average sequence length? Print the name of the organism with the longest sequence.
5. Suppose you are given a DNA sequence in the variable `seq`. Write code to determine the reverse complement.
6. Suppose you have a DNA sequence in the variable `seq`. Produce a new sequence exactly the same except the first letter is 'C'.
7. Write a Python program to do the dot product between two vectors given as lists of the same length
8. Write a Python program to sort a list of numbers using the bubblesort algorithm
Bubblesort algorithm to sort a list of numbers called l :
for $i = 0$ to $\text{length}(l)$, $i=i+1$ {
 for $j = i+1$ to $\text{length}(l)$, $i=i+1$ {
 if($l[i] > l[j]$) then switch $l[i]$ and $l[j]$
 }
}
9. Write a Python program to multiply a matrix given in M with a vector u .
10. Write a Python program to determine the transpose of a matrix
11. Write a Python program to read a matrix from a file and transpose

Bit more advanced:

1. Write a Python program to read DNA sequences from a file into a list
2. Write a Python program to read a data file in row column format into a two dimensional list in Python
3. Write a Python program to read in vectors one at a time from a file and print the Euclidean length of each vector in the file.