Python 4 Problem Set

1. Write a script that uses a `while loop` to print out the number 1 to 100
2. Write a script that uses a `while loop` to calculate the factorial of 1000.
3. Iterate through each element of this list using a for loop: [101,2,15,22,95,33,2,27,72,15,52];

- Print out only the values that are even (use modulus operator).

2. Iterate through each of the elements of the above list, but make sure to sort them numerically.

- Print each element.
- Create two cumulative sums, one of all the even values and one of all the odd values.
- Print the two sums.

5. Use `pop()` and `remove()` with the list of integers.

`pop()`

- Print your list before you start.
- Store the value returned by `pop()`.
- Print the value and the list.
- What happened to the orginal list?

`remove()`

- Print your list before you start.
- Store the value returned by `remove()`.
- Print the value and the list.
- What happened to the orginal list?

6. Write a script that uses `range()` in a `for loop` to print out every number between 0 and 99
7. Add a loop that uses `range()` to print out every number bewteen 1 and 100
8. Rewrite the script to take to values from the command line
9. Now only print the number if it is odd.
10. Use a `for loop`, with the variable containing the list as the *sequence*, to iterate through each element of this list ['ATGCCCGGCCCGGC','GCGTGCTAGCAATACGATAAACCGG', 'ATATATATCGAT','ATGGGCCC']. i.e, `for var in list:`

- Print out each element
- Print out the length along with the sequence i.e., "4\tATGC\n"

7. Use a `for loop` with `range()` instead of using the list variable to iterate through each element the list from the last Question. i.e, `for var in range(x):`

- Print out each element
- Print out the length along with the sequence i.e., "4\tATGC\n"

10. Create a shuffled sequence

Use a for loop to perform the following procedure N times (N = length of seq) Select a random position A with randrange() Select a random position B with randrange() Exchange the letters at list indices A and B Print the final shuffled sequence

Remember to test your code with test data.

11. Start with 2 very similar DNA sequences. Use your favorites or use Python_04.fasta Align with ClustalW, TCoffee, or some other web alignment application. Output should be in FASTA format. Store (copy and paste) each aligned sequence, including dashes, as two separate string variables. Be

aware of the newlines (if any) Use a `for loop` with `range()` to compare each index for nucleotide differences. Report the nucleotide position of each difference.

12. Write a script in which you construct a dictionary of your favorite things.

Some of my favorites:

Type	Favorite
book	Jitterbug Perfume
song	Tom Petty - I Won't Back Down
tree	Cedar

13. Write a script that iterates through each nucleotide of a DNA string:

- Print out each nucleotide
- Create a counter for each nucleotide. Count each nucleotide without using `count()`.
- Print out the final count of each nucleotide.

```
A = A_total
T = T_total
G = G_total
C = C_total
```

14. Alter your counter in the last script use a dictionary for counting each nucleotide.
15. Write a script to find the intersection, difference, union, and symetrical difference between these two sets.

```
Set A = 3 14 15 9 26 5 35 9
Set B = 60 22 14 0 9
```

16. Have you been commiting you work?