Python Exercises

1. For a given list, do the following:
   1. Filter the odd numbers only.
   2. Filter words that start with ‘A’.
   3. Filter words that are in another given list.
   4. Filter words that contain the letter ‘e’.
   5. Get items at even indices in the list.
   6. Get a the largest slice from the start of the list whose sum doesn’t exceed 25.
   7. Count number divisible by 3.
   8. Get the largest two digit number.
   9. Get a list of unique numbers.
   10. Get numbers that appear more than once only.
   11. Get all pairs of numbers whose greatest common divisor is one (hint: you can use math.gcd).
   12. Get a dictionary of items alongside their frequency distribution.
   13. Get a dictionary of data types in the list alongside a list of all the items of that type.
2. For a given string, do the following:
   1. Turn the first letter in every word to upper case and all the other letters to lower case. (e.g. “cairo uni” should become “Cairo Uni”).
   2. Reverse all words individually in the string (e.g. “Cairo Uni” should become “inU oriaC”)
3. Given a list of names and a corresponding list of grades, sort the names according to their grades.
4. Try implementing the following algorithms:
   1. Binary Search
   2. Search in a Binary Search Tree
   3. Sieve of Eratosthenes
   4. Quick Sort
   5. Maze Solver on a 2D grid.
5. Implement an TicTacToe game in python (Hint: you can use the function “input” to read from the user).