Problem 1:

1.2

In simple solution (SolutionP1-1.py) I have used in-built data structure **Set** of python.

However, in a slightly optimised version (SolutionP1-2.py) have used **List.**

Reason being Lists are relatively faster than Set specially while iterating over items. Although, Sets are faster when it comes to checking if an object is present in that data structure but since I did not have such requirement for my requirement (P1) List is better than Set.

Did not use Tuple due to the fact that they are immutable hence cannot be modified after creation.

1.3

Calculated the execution time of the program by hardcoding the values which need to be entered by user.

To find alphabet 'y' in 9^{th} position

output: result {'dictionary'}

Set:

Runtime of the program: **0.0256**93506000000005

List:

Runtime of the program: **0.0253**3000000000002 (slightly better)

Problem 2:

I have written 2 programs for this question.

2.1a – To print list of words that are anagrams ordered by the length of lists

2.1b – To print the list of words that are anagrams and contains n letters which is given as an input.

2.2 - Data structure used: Dictionary and List

I primarily used dictionary because the requirement was to store key and pair and it's more efficient to traverse through elements of a dictionary than list. Moreover, dictionary is implemented in the form of hash table hence take less time and storage space compared to list.

In the end I used a list also because it accommodates duplicate keys and my requirement was to keep the count of words as key which can repeat.