Question_3
Write a 300-word report describing how your algorithms works for Q2.

Before we start with the main functions, in order to use the functions from random module and string module. I have imported each of the module using import. After that, I have defined a function named “Question_2” for the program. For that particular function I have put “length” as a variable. A set which to be picked from is needed. Therefore, using the stirng.ascii_lowercase I called up only the lowercased alphabet from ascii list, and have defined it as “set”. Finally, I have also created a variable “word” as a string which is going to be the final value of the function “Question_2” after the while loop. Before the while loop word is define as “”. However, due to the condition which is the length of the defined “word” smaller than the variable length of function “Question_2”, the while loop will run. If the while loop runs, through the code, a random number between 1 and 3 will be selected. If 3 is selected which is 1/3 (33.33%), r will be defined randomly from [1,3,5,7, … ,23,25], which will be defined as even alphabet (“b”, “d”, “f” ..) if in the form of set[r]. If 1 or 2 is selected which is 2/3 (66.67%), r will be defined randomly from [0,2,4, … ,22,24], which will be defined as odd alphabet (“a”, “c”, “e” ..) if in the form of set[r]. After the r is chosen, redefine the variable “word” as “” + the chosen set[r]. For example, if the chosen r was “1”, which is “b” in alphabet the variable “word” will be defined as “” + “b”, which is “b” for the first loop. However, if the condition meets the while loop, this process is repeat until the condition of “length of the defined “word” smaller than the variable length of function “Question_2”” is a false statement. If than, the loop will break, and the value of the “word” will be defined.

Question_4
Write a 300-word report about differences of true and pseudo random numbers.

To begin with, by the number itself, as human there is no way for us to know the difference. It is because numbers are just numbers. The biggest difference between true random numbers and pseudo random numbers are how they are generated. Therefore, it is important for us to know the difference between the TRNG (true random number generator) and PRNG (pseudo random number generator). For TRNG, the generator uses an unpredictable physical means, which cannot be controlled by human, as a factor to generate the numbers. For example, atmospheric, photosphere, cosmological noise and more. On the other side, for PRNG, the generator uses mathematical algorithms in many kinds, which are 100% generated by the computer. To be more detailed, pseudo random numbers are mainly based on the combination of the algorithms and the seed. Therefore, if the user set the seed and the algorithm as same as before, it is possible to control the random number’s value. Likewise, If the user knows the algorithm and the seed, it is possible for the user to easily predict the results. In other words, the randomness can be controlled. This simply proves to us that the pseudo random number generator is not random anymore. However, interestingly true random numbers are not perfectly random in some circumstance. As technology develops it have been able for humans to measure some of the factor which can be the variable of the true random number generator. which means that, in some conditions true random numbers can also be predicted. Therefore, what I am trying to say is, the main difference between the two random numbers currently is rather the randomness can be truly stay random. Rather can the factors of the generator be controlled. Currently for true random numbers, it is impossible, for pseudo random number, it is possible.