Data Engineering Lab
Assignment 3

Instructions:

1. Provide commented, indented code. Variables should have meaningful names.
2. Write questions in separate text blocks before the code blocks containing answers.
3. Read the questions carefully before answering. If a question asks to follow a particular approach or to use a specific data structure, then it must be followed.

Questions:

1. Read an input string from user and check whether it is a palindrome or not using the stack data structure (1 mark).
2. Read lines from the file '1.txt', sort the lines in natural sort order using the third letter of each line and finally write the sorted result to a file '1_out.txt' (1 mark).
3. Write a higher order function that has a formal parameter 'mode' of type int. If mode is '1', this function should return a lambda function that converts a passed in temperature from Celsius to Fahrenheit and if mode is '2' the higher order function should return a lambda function that converts a passed in temperature from Fahrenheit to Celsius. Call the higher order function for both modes and use the returned functions to convert 58 degrees Celsius to Fahrenheit and 58 degrees Fahrenheit to Celsius (1 mark).
4. Create a 4x4 matrix (list of lists) with random positive integer values using list comprehension. Use this matrix and list comprehension to create a new matrix such that even numbers remain unchanged, but odd numbers get incremented by 1 (1 mark).
5. Read lines from files '5_1.txt' and '5_2.txt', find out the words that are present in file '5_2.txt' but not in file '5_1.txt' and finally write the result to a file named '5_out.txt' (1 mark).

Files to be submitted:

1. .ipynb file containing code named as '*YourName_YourRollNo*_Assignment3.ipynb'
2. 1_out.txt
3. 5_out.txt