**Fundamentals of Data Science**

**Assignment 1 Total Marks: 25**

**Note: Create a single python file and name it properly. Also mention your name and roll number in the file. Upload both a .pdf and .ipynb file of your solution.**

**Task 1: Merge Two Strings (6 marks)**

Write a Python program that takes two strings from user and merges them into a third string. Also find the count of each character. Store your results in a dictionary in ascending order of count.

**Sample:**

Input string 1: “Hello”

Input string 2: “World”

Merged String: “Hello World”

Dictionary: {“D”: 1, “E”: 1, “H”: 1, “R”: 1, “W”: 1, “O”: 2, “L”: 3}

**Task 2: Palindrome Strings (6 marks)**

Write a python in C++ that takes input from user in a set. Check the value is symmetrical or palindrome and store your results in list of tuples.

**Note:** A string is said to be palindrome if the reverse of it is same as original. e.g. DAD, MADAM

A string is said to be symmetrical if both the halves of the string are the same. e.g. MAMA, AMAAMA.

**Sample:**

**Input:**

Set: {“madam”, 54345, “MAMA”, 7891789}

**Output:**

List: [(“madam”, “palindrome”), (54345, “palindrome”), (“MAMA”, “symmetrical”), (7891789, “symmetrical”)]

**Task 3: Real life scenarios (8 marks)**

Think about some real-life problems in different domain, and how can you improve it using the Data Science process.

Think about the following:

1. Which data can you collect?
2. How would you collect it?
3. How would you store the data? How large the data is likely to be?
4. Which insights you might be able to get from the collected data? Which decisions you would be able to take based on the data?

Here are some problems that you need to address:

1. How can you use data to control vaccination during the pandemic?
2. How can you use data to make sure you are being productive at work?

**Task 4: Searching Dictionary (5 marks)**

Write a Python program to filter the height and width of students, which are stored in a dictionary, by taking height and weight as input from user.  
**Original Dictionary:**  
{'Cierra Vega': (6.2, 70), 'Alden Cantrell': (5.9, 65), 'Kierra Gentry': (6.0, 68), 'Pierre Cox': (5.8, 66)}  
Height > 6ft and Weight> 70kg:  
**Output Dictionary:**  
{'Cierra Vega': (6.2, 70)}