**Introduction to Data Science**

**Assignment 1 Total Marks: 25**

**Note: Create a single Python file for python related tasks. Upload both a .pdf and .ipynb file of your solution. The file name should be your Name+Roll number.**

**Task 1: Online Bookstore Inventory Management (7 marks)**

1. **Inventory Management:**
   * Create a dictionary where book titles are keys, and their corresponding values are tuples containing information such as the author, genre, price, and quantity available.
2. **Functionality:**
   * Implement functions/methods to:
     + Add a new book to the inventory.
     + Remove a book from the inventory.
     + Update the quantity of a specific book.
     + Display all available books.
     + Search for a book by its title or author.
     + Display books by a particular genre.
3. **Book Class:**
   * Create a Book class that includes attributes like title, author, genre, price, and methods to retrieve and modify these attributes.

**Task 2: Palindrome Strings (5 marks)**

Write a Python program that takes input from the user in a set. Check whether the value is symmetrical or palindrome, and store your results in a list of tuples.

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

A string is said to be symmetrical if both 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 (7 marks)**

Think about real-life problems in different domains and how you can improve them 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 is the data likely to be?
4. Which insights might you be able to get from the collected data? Which decisions would you be able to make based on the data?

Here are some problems that you need to address:

1. How can you use data to get benefits from data science?

**Task 4: Student Enrolment System (6 marks)**

1. **Student Management:**
   * Create a class **Student** that holds attributes such as student ID, name, age, courses enrolled, and grades.
   * Use a dictionary where the keys are student IDs and the values are instances of the **Student** class to store student information.
2. **Functionality:**
   * Implement methods to:
     + Add a new student.
     + Remove a student.
     + Update student information (e.g., add/remove courses, update grades).
     + Display student details.
     + Calculate average grades for a student.
     + Generate a list of students enrolled in a particular course.
3. **Course Management:**
   * Implement a class or data structure to manage courses offered, their IDs, names, and associated students.