M.Sc. (Five Year Integrated) in Computer Science

(Artificial Intelligence & Data Science)

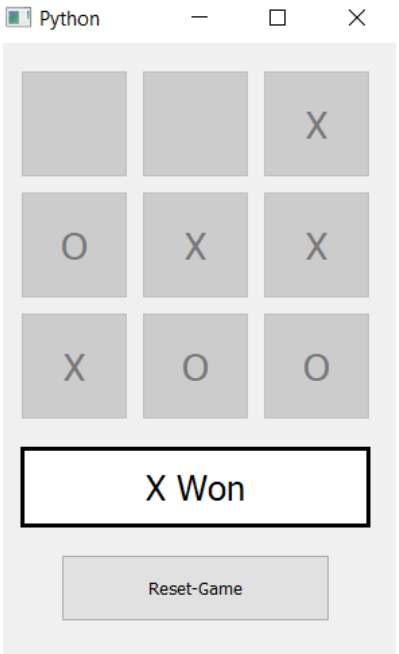
Semester 1

Python Programming Lab

LAB CYCLE 3

Instructions:

1. Do and write programs with proper naming conventions.
2. Practice all programs on your own. Copying the solution from others will be penalized.
3. Maintain Index/ content properly.
4. Brief descriptions including algorithm used and flowchart of the work you did for each exercise.
5. If you believe I have an error in a lab, please inform me of it. Explain why you think it is an error and, if you like, suggest a correction.
6. Perform unit testing with prepared test cases.
7. Save the programs in a separate folder on PC (in Lab), and push it in your Git repo.

SL No	Question	Concepts Covered
1.	Develop a two-player tic-tac-toe game using pygame 	Pygame library

2.	Implement Principle Component Analysis(PCA) of a matrix. Reference : http://kiwi.bridgeport.edu/cpeg540/PrincipalComponentAnalysis_Tutorial.pdf	Numpy, Linear Algebra
3.	Create an account in Kaggle.com Download iris dataset from the link https://www.kaggle.com/datasets/saurabh00007/iriscsv Load it using pandas library Prepare the following charts : • Bar chart showing the frequency of species column • Apply PCA to get two principle components and show the data distribution as a scatter plot. (use functon from sklearn) • Show the distribution of each attribute as histogram. Note: for visualization, you can either use matplotlib or seaborn	Visualization, Data processing, Libraries : pandas, matplotlib, seaborn, histogram
4.	Design a class to store the details of a vehicle such as engine number, model, type, mileage, vendor, registration number, and owner name. Design another class that holds the details of several vehicles and provide functions to • Display the details of the collection • Sort the collection according to mileage • Add, Delete and Modify the entries from the collection • Store and Load the collection as a pickle file • Filter the result according to the attributes and export it as a report. https://pbpython.com/pdf-reports.html	OOPs, Pickle, PDF report generation, Lambda functions for sorting
5.	Convert the task in Question 4 as a UI based application using Tkinter or PyQT	GUI using tkinter or PyQT