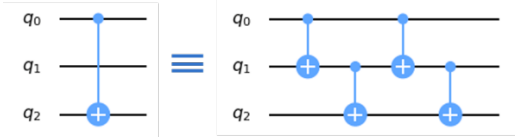
Spring 2025 CIS 492/593694 – Quantum Machine Learning Assignment 1 Grading Rubric

Assignment 1 Questions	Poor 0 pts	Fair 4 pts	Good 7 pts	Excellent 10 pts
Qn. 1 The gates available in Qiskit are only small part of quantum gates one can apply in quantum circuits. In this exercise, create the following gate and apply on a one qubit system using the operator method in qiskit. Also provide the screenshot of the Python code $A = \frac{1}{\sqrt{2}}(\sigma_x + \sigma_y)$ $= \begin{pmatrix} 0 & \frac{(1-i)}{\sqrt{2}} \\ \frac{(1+i)}{\sqrt{2}} & 0 \end{pmatrix}$	No or very little documentation–OR- it is written in such a way that it is not engaging.	There is a try Provided screenshot of Circuit (OR) Correct Code for the requirement, though they are incorrect.	Provided screenshot of **correct** Circuit (OR) Correct Code for the requirement.	Provided screenshot of **correct** Circuit AND Correct Code for the requirement.
Qn. 2 Show using the unitary simulator in Qiskit that the following two circuits are equivalent. Tip: You can show that they are equivalent using the difference in their unitary. Also provide the screenshot of the Python code 	No Answer documentation–OR- it is written in such a way that it is not engaging.	There is a try. However, could not demonstrate that two circuits are equivalent using the screenshot. Also code demonstrated using the screenshot is incorrect.	Demonstrated two circuits are equivalent using the screenshot.	Demonstrated two circuits are equivalent using the screenshot. In addition, provided correct code for the problem using the screenshots.

Qn 3. Using Python code, perform the following Tensor operations.: Find $u \otimes v$ and $v \otimes u$ for the given vectors $u = \begin{bmatrix} -2 \\ -1 \\ 0 \\ 1 \end{bmatrix}$ and $v = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ Also provide the screenshot of the Python code**.**	No Answer documentation–OR- it is written in such a way that it is not engaging.	Provided screenshot of the Tensor Operations or Code. But they are incorrect.	Provided screenshot of correct answer for the Tensor operations	Provided screenshot of correct answer for the Tensor operations. Also provided correct code to perform the Tensor operations.
				Sub-Total= _/30

Final Score = 100/30* Points Scored