Welcome to the Global Quantum Hackathon!

> Your task is to build a quantum machine learning model that predicts future stock index closing prices based on historical data.
> This competition is designed to explore the power of quantum-enhanced models in time series analysis.

Provided Files

You will receive the following datasets:

File	Description
`X_train.xlsx`	Historical stock index data from **January 1 to August 31, 2025**. Includes: `Date`, `Open`, `High`, `Low`, `Close`, `Volume`.
`X_test.xlsx`	Data for the **next 10 trading days** (starting September 1, 2025). Includes all columns **except** `Close`, which you must predict.
`predictions.csv`	You will submit this file with your predicted `Close` values for each date in `X_test.xlsx`.

Objective

Build a model that predicts the missing `Close` values in `X_test.xlsx`.
Your model must be based on **quantum machine learning principles** and trained using the data in `X_train.xlsx`.

Evaluation Criteria

Your predictions will be evaluated using:

- **Mean Squared Error (MSE):**
- **R^2 Score (Coefficient of Determination):**

Lower MSE and higher R^2 indicate better performance.

⚠ Submission Requirements

To be eligible for evaluation:

- Your model must **incorporate at least one trainable quantum circuit**.
- **Purely classical models** (e.g., neural networks or regression models) **will not be accepted**.
- **Hybrid models** that combine classical and quantum components **are allowed**, as long as the quantum part is trainable and contributes meaningfully to the prediction.

Suggested Tools

You may use any framework that supports quantum machine learning, such as:

- PennyLane
- Qiskit
  with PyTorch or TensorFlow

Submission Format

Please submit the following:

1. `predictions.csv` — your predicted `Close` values for each date in `X_test.xlsx`
2. A brief description of your model architecture and training process
3. Source code (Python preferred) with clear instructions to reproduce your results

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Tips

- You may use angle encoding, amplitude encoding, or other quantum data encodings.
- Consider using sliding windows or other time series preprocessing techniques.
- Normalize your data **only using the training set** to avoid data leakage.

Good luck, and may your quantum circuits converge!