TCS Quantum Challenge 2023

Challenge 4 – Forecasting FTSE 100 Index

Technical - Frequently Asked Questions (FAQ)

Version 1.0

1. **What are the deliverables for each phase (Phase 1 and Phase 2) of the Challenge?**

   Phase 1:

   During this phase the participating teams will be expected to submit and present their proposed approach to solving one or more of the Challenge Statements, along with some results of preliminary experimentation using the approach. The submissions and presentations will be evaluated by a jury panel, and the most promising proposals for each Challenge Statement will be shortlisted for participation in Phase 2.

   Note: In phase 1, code is not required, however participants are welcome to include the same.

   Phase 2:

   During this phase the teams shortlisted at the end of Phase 1 will be expected to implement their solution using quantum hardware/simulators provided and then submit & present their results, learnings and proposed future work. The submissions and presentations will be evaluated by a jury panel, and the best solution to each Challenge Statement, as adjudged by the jury will be declared as the winner.

2. **Will TCS provide the classical benchmarks/algorithms against which the quantum solutions will be compared?**

   It is up to the participants to come with a classical benchmark. Of course, the results will be compared against our internal benchmarks and the ground-truth. The metrics to be used are RMSE (root mean squared error) and MAE (mean absolute error). Lower the error, the better.

3. **How will the solutions be technically evaluated?**

Trivially, one metric for evaluation will be the RMSE/MAE of the prediction against the ground-truth, and against our internal benchmarks. Additionally, there will be weightage on the "percentage of quantum" in the solution architecture, theoretical analysis, justifications, explainability, etc.

4. **[Dataset] What should be the window of forecast?**

We expect the prediction duration to be at least for 10 days. But, greater the window of prediction, the better, as predicting for a longer term is generally more difficult.

5. **[Dataset] Besides FTSE, what are the other sheets for? Do they need to be predicted, too?**

No, only the FTSE needs to be predicted. The usage of data in the other sheets is left to the creativity and ingenuity of the participants.

6. **[Dataset] Does the closing FTSE for each day need to be predicted?**

Yes, the closing price needs to be predicted.

7. **[Dataset] How to handle missing values in the dataset?**

The missing values can be replaced with the closing prices from the previous day. The missing values are generally due to holidays in different countries/markets and the best approach is to take the previous day values.

8. **Can we use a hybrid approach – Classical + Quantum?**

Yes