TCS Quantum Challenge 2023

Challenge 1 – Replenishment of Retail Stores

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. **Which file contains data for "Store demand by product, by time period”? There is historical sales data, is it the same?**

   Yes, the historical sales and forecast(fcst.csv) contains data for store demand by product.

3. **"Total budget amount (Available inventory capital) for store and DC" not present?**

Any feasible total budget amount can be assumed by the candidate, also behaviour of solutions for different values of budget can be observed and noted.

4. **"Product categories: (Combination of below categories)" not present?**

   These are not present to reduce the complexity of the problem.

5. **"SKU segment" does not seem to be present?**

   Not, present to reduce the complexity of the problem.

6. **SKU mapping from DCs to stores not present?**

   Not, present to reduce the complexity of the problem.

7. **Allocation priority order of stores from DCs not present?**

   Not, present to reduce the complexity of the problem.

8. **What is #oh (last column) in StoreStock file? Is it no of units of the item?**

   Yes, OH stands for on hand.

9. **What is the definition of "total invested inventory value”? Is it on-hand inventory X holding cost?**

   It is total inventory in a given time period X total cost (holding+procurement)

10. **Question # 10 In the Fcst file, why are some totfcst negative? What do these quantities mean?**

    The negative values can be changed to zero.

11. In the Fcst file, the quantities are very small .. The largest one is 2.10. Is there a reason for this? Is it ok if we multiply these by 10 so results look more comprehensible?

Yes, you can multiply the forecast value by 10 or 100 but make sure you make necessary changes in other datasets as well if required to maintain consistency across the dataset.

12. DCs/stores capacity and available inventory capital not present

Appropriate feasible value for the inventory capital can be assumed by the candidate.

13. "On hand inventory of preceding time period <= On hand inventory after current time period + expected demand to be satisfied, provided inventory replenishment order is expected arrived or not"

Does this mean that the constraint is to be satisfied even if the replenishment order is not received in the time period?

Yes, by taking the replenishment order received = 0

14. "On hand inventory + expected demand to be satisfied on time period, t >= forecasted demand + safety stock"

Should this be <= instead of >=?

It should be >=. This is because on hand inventory left after demand being fulfilled in time period t must be greater than the predicted forecast and calculated safety stock

15. One of the inputs is "Standard normal value (z-value) associated with CSL". CSL of each product is not present in the dataset. Also, this CSL class is listed as one of the decision variables. Is this correct?

It is expected that CSL be calculated by the solution model. Yes, CSL class is mentioned as decision variable.