

TCS Quantum Challenge 2023

Frequently Asked Questions (FAQ)

Version 1.1

1. What is the TCS Quantum Challenge?

Quantum Computing (QC) promises to deliver exponentially greater processing power that will lead us to efficient solutions to problems that are complex and intractable for classical computers. The TCS Quantum Computing Challenge is a problem-solving challenge for university students, researchers, aspiring entrepreneurs and quantum enthusiasts. Working with clients from a wide variety of industries, we will set out a set of real-life business challenge statements that could immensely benefit from a Quantum Computing approach to solving them.

2. Who can participate?

The challenge is a Team Event where each team consists of 2 to 5 members. The individuals in a team could be students, researchers, working professionals or just quantum enthusiasts and should be eighteen (18) years of age or older at the time of registering for the challenge.

3. What is the timeline of the Challenge?

Please refer to the 'Timeline' tab on the Challenge website.

4. How is the Challenge structured?

The Challenge will run over 2 phases:

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

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

5. Why should I get involved? What is the prize and what can participants win / achieve by taking part into this challenge?

The total prize money for the challenge is 6000 GBP, to be distributed as follows:

- 1000 GBP to be awarded to the entry adjudged as the best solution for each of the 4 Challenge Statements.
- 2000 GBP to be awarded to the entry adjudged as the overall best solution across all the 4 Challenge Statements

This is an excellent opportunity for pitching your idea progress to a panel made up of investors, entrepreneurs and scientists.

Gives you a chance for blue sky thinking with real-time feedback from challenge area experts, founders and investors in the Quantum Computing discipline and to meet like-minded quantum thinkers, build networks and develop skills.

6. Who is sponsoring this contest?

TCS is sponsoring this along with following partners:

- QCS – Quantum Computing and Simulation Hub, UK
- Amazon

7. Can I submit my entry individually or do I need to form a team?

The Challenge is a Team Event and hence individual entries are not accepted.

Only the Team Lead will have access to submit the solution for the case study on behalf of the team. If you are a 'Team Member' you authorize your 'Team Lead' to submit the solution on your behalf and agree that the terms and conditions shall apply to submission made by your 'Team Lead' on your behalf.

8. Do all participants within a team have to be from the same academic institution/company?

Teams could be made up of individuals from different universities/institutes/organizations

9. Do all participants within a team have to be of the same nationality?

No. The participants could be from any country.

10. What other conditions am I agreeing to by entering this challenge?

Please refer to the terms & conditions that are listed in the "Terms & Conditions" section of the 'Registration' site.

11. What do Levels (Level 1 and Level 2) imply for the complexity challenge?

A Challenge under the TCS Quantum Challenge could comprise of two sub-challenges at graded levels of complexity, i.e. a Level 1 which is comparatively simpler and a Level 2 which is more complex.

It is expected that participants would first attempt to solve the Level 1 sub-challenge and then having solved the Level 1 problem, move on to solving the Level 2 sub-challenge.

At a minimum, the submitted solution should address the Level 1 sub-challenge. Solving the Level 2 sub-challenge is optional.

Solving the Level 2 sub-challenge carries additional weightage during evaluation. However, a solution to the Level 2 sub-challenge does not necessarily guarantee a higher ranking. An entry that only solves the Level 1 sub-challenge may end up getting assessed higher than an entry that solves both the Level 1 and Level 2 sub-challenges

12. How do I get to submit my entry?

The Challenge page is hosted on the following website:

<https://www.qcshub.org/tcs-challenge>

Please follow the registration process on the above website to submit your entry.

13. What constitutes an eligible entry?

For an entry to be eligible:

- i) The participating team should have registered at the Challenge registration site and accepted the T&C, on or before the last date of registration
- ii) The entry should have been submitted on or before the last dates of submission for Phase 1 and Phase 2 (as applicable)
- iii) The entry should not violate any of the Challenge Rules of the Challenge, listed in the 'Terms and Conditions' section of the Registration Site.

14. What type of Quantum Computer should be used for the submitted solutions?

TCS has partnered with Amazon for providing access to quantum hardware resources for the Challenge. Amazon Braket is a fully managed quantum computing service designed to help speed up scientific research and software development for quantum computing.

For Phase 1 of the Challenge, each participating team will be provided with \$500 worth of AWS credits per every challenge statement that the team opts to work on.

For Phase 2 of the Challenge, the teams would be required to provide an estimate of the resources that they would need in Phase 2, as a part of their Phase 1 submission. The estimate will need to be supported with appropriate justification for the resources required, and the experimentation design/approach for Phase 2. Value of AWS credits provided would depend on the estimates, justification, and experimentation design/approach provided.

15. During the challenge, can participants interact with TCS?

Yes, participants may interact with TCS throughout the course of the challenge. Participants may reach out to TCS by writing an email to quantum.challenge2023@tcs.com

16. What language must be used?

The language for all communication is English.

17. How will you communicate with us?

TCS will communicate with the “Team Lead” of your team through the contact email id provided at the time of registration. Please note that TCS may not communicate with each team member individually.

18. What are the criteria for assessment of the participant entries?

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. The decision of the jury remains final.

Please refer to the Challenge Website <https://www.qcshub.org/tcs-challenge> for the evaluation criteria for Phase 1 and Phase 2.

19. When does the assessment take place and when are we informed of the results?

Please refer to the “Timeline” tab on the Challenge Website: <https://www.qcshub.org/tcs-challenge>

20. Who owns the Intellectual property of the ideas?

All submissions to the TCS Quantum Challenge 2023 will be under Apache Open Source (available at <https://www.apache.org/licenses/LICENSE-2.0>).

21. How will the results be announced? How can I find out who won?

The results of the challenge will be announced online on the Challenge website.

22. Will you arrange travel and/or a hotel for the finalists?

No. You are responsible to make travel arrangements and stay by yourself suitable for your personal situation and location.