
Workshop challenge
Where Quantum Optimization meets Art
Pasqal Theater Festival
SCHEDULE PLAYS WITH SHARED ACTORS
Quantum
Summer Lab 2025
Powered by
Microsoft
quantum circle
Pasqal
CRONOS GROEP
MiCRONOS

Why participate

Pasqal

WIN QPU TIME

Winners will receive 1 hour of runtime on Pasqal's QPU through Azure.

QUANTUM IN ACTION

Solve a real-world problem with quantum optimization approaches.

BOOST YOUR SKILLS

Build on what you learned and continue growing beyond the workshop

The Challenge

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THE PROBLEM

We are organizing the first edition of Pasqal Theatre Festival, and we'll propose 20 different plays to our public.

- We want to give the attendees the opportunity to see as many plays as possible during the weekend, so we have decided that each play will be performed twice during the festival
- To fit all the performances within the weekend, we need first to decide how many venues we need to book
- But here's the catch: since booking them costs money and we have a strict budget, we cannot afford booking all the venues in the city, so we need to book the minimum number of theatres as possible
- We already have the list of plays, and we just realized that many of them share some of the **500 actors** that will be performing through the weekend
- It's important to mention that the festival will start on Friday night and will have its last sessions on Sunday night.
- Also, to have time to setup the stage before each session, each theatre can host at most 3 plays per day: one in the morning, another one in the afternoon, and one in the evening. This will also give time to the public and the actors to move from one theatre to another if they want or need to.

THE TASK

1. Assign each of the 20 plays to two distinct time slots.
2. Ensure no actor is scheduled to perform in overlapping plays at the same time.
3. Minimize the total number of time slots needed.
4. Decide how many theaters we need to book.

Input Data

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We're sharing a CSV file representing a **500 × 20 matrix,** where

- Each **row** corresponds to an actor (A1 through A500)
- Each **column** corresponds to a play (Play1 through Play20)
- A cell value is **1** if the actor performs in that play, or **0** if they do not

Here's an example with 5 actors and 3 plays

ActorID	Play1	Play2	Play3
A1	1	0	0
A2	0	1	1
A3	1	0	1
A4	1	0	0
A5	0	0	1

TOY INSTANCE

Requiring at most 8 qubits. You can solve the challenge locally, from your laptop:
Pasqal_Festival__plays_and_actors_toy_instance.csv

FULL DATASET (if you want to play big ;))

Requiring more than 8 qubits. You will need Cloud access to solve the challenge.
Pasqal_Festival__plays_and_actors.csv

How to Participate

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WHAT TO SUBMIT

An explanation of why your modelling strategy

How you solved the problem

The total number of venues we need to book, and their time slots used with the related play

HOW TO SUBMIT IT

Share your results on LinkedIn. Tag all the event partners: **Pasqal**, **Microsoft**, **Micronos**, **De Cronos Groep** & **Quantum Circle**. Use the event hashtag **#QuantumSummerLab25 .**

Evaluation Criteria

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CRITERION	DESCRIPTION	WEIGHT
Problem Understanding	Correct interpretation of the use case, clarity of assumptions, alignment with optimization goals	15%
Algorithm Design	Correctness, creativity, scalability, and adaptability of the approach	25%
Implementation Quality	Code reliability, efficiency, readability, and proper solver integration	20%
Optimization Performance	Quality of solution vs. optimal, execution speed, robustness across test cases, tradeoff management	25%
Presentation & Communication (Reporting)	Clear explanation of approach, quality of visualizations, insightfulness of performance analysis	15%
Bonus (optional)	Exceptional originality, unique use of solver features, or highly reusable/documented solution	+10%

Timeline & Prizes

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SEPTEMBER 5

Challenge Launch

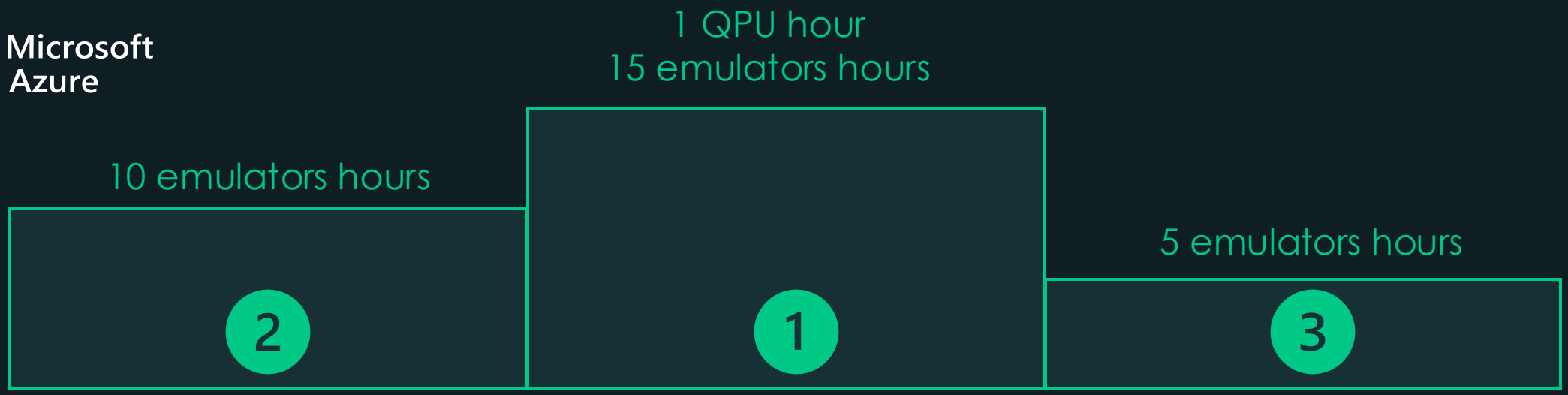
SEPTEMBER 21

Challenge Deadline

SEPTEMBER 30

Winners Announcement

Microsoft Azure



For more details

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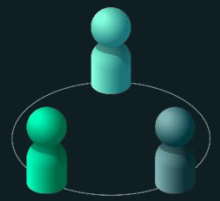
Find all the details on the challenge on GitHub
https://github.com/pasqal-io/quantum-summer-lab-2025



Get in touch and chat with the Pasqal Community
https://community.pasqal.com/

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