



QSLOVENIA Entangling Event

Join us in the second quantum revolution!

QBronze133 | Quantum Computing and Programming Workshop, April 13-14 & 20-21, 2024

We are pleased to announce the entangling workshop of QSlovenia! Join us for the introductory workshop “Quantum Computing and Programming” and learn the basics of quantum computing and how to write simple quantum programs.

We invite highschool students, university students and graduates, researchers, professors, and industry experts in the region. We will use introductory tutorials called Bronze-Qiskit by QWorld. We will use Discord to communicate with each other and conduct the workshop. Jupyter notebooks, lectures, and mentoring will be in English. Mentoring can also be in Slovenian.

We will share homework via QWorld Canvas (five homework assignments, in total 100 pts). The participants who complete them all successfully (at least 50% for each) with at least 75 pts in total, will earn their diplomas!

Participants will be attending the lecture and completing the tasks on their own. Mentor support will be provided for participants to ask their questions and share their progress with mentors. The workshop will be held over 4 days, with a total of 18 hours of training.

Quantum Workshop Schedule

Day 1 | Saturday 13 April (14:00 – 18:00 UTC+2)

Day 2 | Sunday 14 April (14:00 – 18:00 UTC+2)

Basics of quantum systems

Hadamard Operator, One Qubit, Quantum State, Visualization of a (Real-Valued) Qubit, Superposition and Measurement, Operations on the Unit Circle, Rotations, Reflections, Quantum Tomography

Day 3 | Saturday 20 April (14:00 – 18:00 UTC+2)

Multiple qubits and quantum communication protocols

Two Qubits, Phase Kickback, Multiple Control Constructions, Entanglement and Superdense coding, Quantum Teleportation

Day 4 | Sunday 21 April (14:00 – 18:00 UTC+2)

Grover's search

Inversion About the Mean, Grover's Search: One Qubit Representation, Grover's Search: Implementation

The participants are expected to work individually at least 16 hours to complete the following sections of Bronze-Qiskit: ***basics of classical systems, basics of quantum systems, basic quantum operators, quantum correlation and quantum protocols, and quantum search algorithm.***

Find the QBronze notebooks here:

<https://gitlab.com/qworld/bronze-qiskit>

The tutorial is a collection of Jupyter notebooks, and each notebook has a recorded lecture. We use python to solve the tasks and the Qiskit library to code quantum programs. The participants should know at least one programming language, and they should make themselves familiar with Python before the workshop if they do not know Python. However, we will have a preparation day that holds: introduction to Python, the installation instructions and a few notebooks on basics of mathematics and participants should review them before the workshop starts.

Application for our quantum workshop

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Workshop Team

Organizers: Paweł Gora and Aljoša Žerjal

Workshop Lead: Maksim Dimitrijevič

Mentors: Dean Mozetič, Dhawal Verma, Laura Martínez, Jagjeet Singh Chauhan, Murshed SK, Helarie Rose Medie Fah

Contact: *qslovenia [at] qworld.net*

Code of Conduct

Our event is dedicated to providing a harassment-free workshop experience for everyone, regardless of gender, gender identity and expression, age, sexual orientation, disability, physical appearance, body size, race, ethnicity, religion (or lack thereof), or technology choices. We do not tolerate harassment of event participants in any form. Sexual language and imagery is not appropriate for any event venue, including talks, workshops, parties, Twitter and other online media. Event participants violating these rules may be sanctioned or expelled from the event.

We respect the minors (children under age 18) and we must make every effort to protect their rights. All private relationships, private communications (including social media channels), or sexual contacts with minors are prohibited.

The default communication channel between the organizers and participants is e-mail. Except filing the application form, the contact info of any attendee or participant cannot be requested by any person from organizer side (i.e., mentor, educator, speaker, organizer, sponsor, or volunteer). On the other hand, any person from organizer side may share his or her contact info with a participant who is not a minor, upon request by the participant.



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If you are being harassed, notice that someone else is being harassed, or have any other concerns, please contact the organizers immediately.

You may also contact directly the members of the Ethics Committee of QWorld.

<https://qworld.net/code-of-ethics-and-conduct/>

Check the above link for more details.

ABOUT US

QWorld is a *global network* of individuals, groups, and communities collaborating on education and implementation of quantum technologies and research activities.

Join us!

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