The quantum coding challenge

Exercise 1: Introduction

In this exercise you learn everything you need to know to program quantum computers.

Level: easy

Exercise 2: Bell States and Quantum Entanglement

Test the Bell inequality, one of the most famous relations in quantum mechanics on a quantum computer!

Level: easy

Exercise 3: Exploring quantum hardware

Investigate the physics beyond a quantum computer and measure the properties of a single qubit!

Level: easy / intermediate

Exercise 4: Deutsch-Josza algorithm

Explore a quantum algorithm which is faster than any classical solution!

Level: intermediate

Exercise 5: Quantum error correction

Learn how to correct errors on quantum computers, one of the most important fields of research for the next ten years!

Level: hard

Exercise 6: Trotterization and Anderson localization

Simulate quantum dynamics on a quantum computer and study different regimes of transport!

Level: hard