FOUNDATIONS FOR QUANTUM PROGRAMMING

Strengthen Your Math and Python Skills in Preparation for Learning Quantum Programming!

Foundations for Quantum Programming is a self-paced, online course that provides the math and Python foundations to help you succeed in Quantum Programming Core.

Objectives

After successfully completing this course, learners will be able to:

- **Identify optimization problem objectives and variables**
- **Represent problem objectives as math expressions**
- **Represent problem constraints as equalities and inequalities**
- **Convert problem constraints to penalty expressions**
- **Combine optimization problem objectives and constraints into an appropriate QUBO function**
- **Represent algebraic functions graphically and using matrices**
- **Write basic Python programs to represent, setup, and organize optimization problems**

Why did we create this course?

Hundreds of learners successfully completed our Quantum Programming Core training and many advanced on to develop quantum applications using D-Wave solvers. While it takes most individuals about 30 hours to complete Quantum Programming Core, those individuals with stronger math and Python skills complete the course with less effort and in less time. They also have greater success applying what they learn in training to solve their own optimization problems.

After seeing these trends and receiving valuable feedback from learners going through our training, we created Foundations for Quantum Programming as an optional prerequisite course to support Quantum Programming Core. While someone could choose to take an entire Python programming course and Linear Algebra course, we've streamlined and condensed those topics to cover the main skills needed for Quantum Programming.

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Course Topics

The first five modules cover foundational math skills, which include:

- Identifying problem variables and assigning variable values
- Describing sets and polynomials
- Evaluating functions
- Formulating problem objectives as quadratic models
- Multiplying polynomials
- Working with summation notation
- Identifying and formulating problem constraints
- Converting constraints to penalty functions
- Describing optimization problems using graphics and matrices

The final module of the course supports foundational Python skills for quantum programming, which includes:

- Using software development environments
- Working with lists, tuples, sets, and dictionaries in Python
- Writing Python ***if*** statements, ***for*** loops, and ***list*** comprehensions
- Creating and calling Python functions
- Working with Python packages

At a Glance: Foundations for Quantum Programming

LEVEL:	MODALITY:	PREREQUISITES:	PRICE:	INTENDED AUDIENCE:
Beginner	Online	None	$350 USD	Anyone who wants to gain or improve their math and Python skills before starting Quantum Programming Core.

SIGN UP FOR FOUNDATIONS FOR QUANTUM PROGRAMMING TODAY!