1 Errata, Friday 17th March, 2023

This document contains errata and corrections for the book. It is being updated on a regular basis. I apologize for my errors and omissions and the inconveniences they may have caused. They are my sole responsibility.

Readers are encouraged to submit their findings to the email address noted in the open-source repository (`qcc4cp@gmail.com`). Many thanks in advance for all findings and corrections!

Page 5: Equation (1.6) was typeset incorrectly. Fortunately, it is being correctly *used* in the rest of the text. The correct form is, of course:

$$(A \otimes B)(a \otimes b) = (Aa) \otimes (Bb)$$

Page 30: The mistake from page 5 is repeated on page 30, where a copy of Equation (1.6) is presented.

Page 65: In the last paragraph, the a and b should be α and β.

Page 73: To compute the probability $Pr(i)$ of measuring the ith basis was incorrectly typeset. Since we compute the *norm* squared, the probability has to be written as:

$$Pr(i) = \left| P_{|i\rangle} |\psi\rangle \right|^2$$

Page 224: Figure 6.18 states that the Hadamard gates should be applied to *all* qubits. This is incorrect, *no* Hadamard gate should be applied to the bottom qubit (which has the Controlled-Z gate).

Correspondingly, the equation at the end of section 6.7.10 has a sign error to the CZ gate, CZ^{n-1} should read CZ^{n+1}. The whole operator should read:

$$H^{\otimes n} X^{\otimes n} (CZ)^{n+1} X^{\otimes n} H^{\otimes n} = -U_{\perp}$$

Page 260: The code is indented incorrectly. It should be:

```
for i in range(1, n):
  if i == fr or i == to:
    diag = tensor_product(w, -w, diag)
  else:
    diag = tensor_product(1, 1, diag)
return diag
```

Page 307: The equation at the top of the page uses the wrong symbol (`\times`) for the tensor product. It should be (`\otimes`):

$$(U \otimes I)(I \otimes V) = (I \otimes V)(U \otimes I) = (U \otimes V)$$

Page 310: In section 8.4.8 of the book, that gate (u_3) has an error in the top right element. The corrected form is:

$$u_3(\theta, \phi, \lambda) = \begin{bmatrix} \cos(\theta/2) & -e^{-i\lambda}\sin(\theta/2) \\ e^{i\phi}\sin(\theta/2) & e^{i(\lambda+\phi)}\cos(\theta/2) \end{bmatrix}$$