






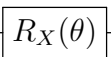
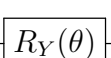
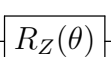




Spickzettel Quantencomputing

Gates

Name	Notation	Matrix
Pauli X		$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
Pauli Y		$\begin{pmatrix} 0 & -\mathbf{i} \\ \mathbf{i} & 0 \end{pmatrix}$
Pauli Z		$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
Hadamard		$\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}$
Phase		$\begin{pmatrix} 1 & 0 \\ 0 & e^{\mathbf{i}\frac{\pi}{2}} \end{pmatrix}$
		
$\frac{\pi}{8}$		$\begin{pmatrix} 1 & 0 \\ 0 & e^{\mathbf{i}\frac{\pi}{4}} \end{pmatrix}$
X-Rotation		$\begin{pmatrix} \cos(\frac{\theta}{2}) & -\mathbf{i} \sin(\frac{\theta}{2}) \\ \mathbf{i} \sin(\frac{\theta}{2}) & \cos(\frac{\theta}{2}) \end{pmatrix}$
Y-Rotation		$\begin{pmatrix} \cos(\frac{\theta}{2}) & -\sin(\frac{\theta}{2}) \\ \sin(\frac{\theta}{2}) & \cos(\frac{\theta}{2}) \end{pmatrix}$
Z-Rotation		$\begin{pmatrix} e^{\mathbf{i}\frac{-\theta}{2}} & 0 \\ 0 & e^{\mathbf{i}\frac{\theta}{2}} \end{pmatrix}$ $\begin{pmatrix} 1 & 0 \\ 0 & e^{\mathbf{i}\theta} \end{pmatrix}$
CNOT		$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{pmatrix}$
CZ		$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$