Quantum_Computing_Part_1

March 8, 2020

[1]:
```
import cirq
import math
```

[2]:
```
#Initialising 5 Grid Qubits
(q0, q1, q2, q3, q4) = [cirq.GridQubit(i,i+1) for i in range(5)]
qubits = (q0, q1, q2, q3, q4)
print(qubits)
```

```
(cirq.GridQubit(0, 1), cirq.GridQubit(1, 2), cirq.GridQubit(2, 3),
cirq.GridQubit(3, 4), cirq.GridQubit(4, 5))
```

[3]:
```
#Creating an object with name 'circuit'
circuit = cirq.Circuit()

#Adding various functions to the Qubits in the Circuit
#Hadamard Gate
circuit.append(cirq.H(q)  for q in qubits)

#Controlled NOT Gate
circuit.append([cirq.CNOT(q0,q1), cirq.CNOT(q1,q2), cirq.CNOT(q2,q3), cirq.
 ↪CNOT(q3,q4)])

#Swapping
circuit.append(cirq.SWAP(q0,q4))

#Rotation
qbits = (q1, q2, q3, q4)
circuit.append(cirq.rx(math.pi/2).on(q) for q in qbits)

#Printing the Cicruit
print(circuit)
```

```
(0, 1):   H  @                ×

(1, 2):   H  X  @  Rx(0.5 )

(2, 3):   H    X  @     Rx(0.5 )
```

```
(3, 4):   H       X      @       Rx(0.5 )

(4, 5):   H              X       ×       Rx(0.5 )
```