

qsharp-example

March 4, 2023

1 Jupyter Notebook with Q# Kernel

An example of a Jupyter Notebook with a Q# kernel.

1.1 Setup

1. Select the Q# kernel in the Jupyter Notebook menu `Kernel → Jupyter Kernel → Q#`.

1.2 Example

Apply a Hadamard gate to a qubit.

1.2.1 Create a Q# Operation

```
[ ]: operation ApplyHadamardGate() : Int [] {  
    let n = 3;  
    mutable result = [0, size=n];  
    use q = Qubit[n];  
  
    ResetAll(q);  
  
    H(q[0]);  
    H(q[1]);  
    H(q[2]);  
  
    for i in 0..n-1 {  
        set result w/= i <- M(q[i]) == One ? 1 | 0;  
    }  
  
    ResetAll(q);  
  
    return result;  
}
```

```
[ ]: ApplyHadamardGate
```

1.2.2 Simulate the Q# Operation

```
[ ]: %simulate ApplyHadamardGate
```

```
[ ]: 0, 1, 0
```

1.3