# Lab 1: 4-Bit Adder

# Half adder

|  |  |  |  |
| --- | --- | --- | --- |
| **Input 1 Input 2 Sum Output Carry Output** | | | |
| 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 |

**A diagram of a device

Description automatically generated**

# 2. Full adder

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input 1** | **Input 2** | **Carry In** | **Sum Output** | **Carry Output** |
| **0** | **0** | **0** | 0 | 0 |
| **0** | **1** | **0** | 1 | 0 |
| **1** | **0** | **0** | 1 | 0 |
| **1** | **1** | **0** | 0 | 1 |
| **0** | **0** | **1** | 1 | 0 |
| **0** | **1** | **1** | 0 | 1 |
| **1** | **0** | **1** | 0 | 1 |
| **1** | **1** | **1** | 1 | 1 |

A diagram of a circuit

Description automatically generated

1. **4 bit adder**

|  |  |  |
| --- | --- | --- |
| **Input A** | **Input B** | **Output** |
| **0101** | **0000** | 00101 |
| **0101** | **0001** | 00110 |
| **0101** | **0010** | 00111 |
| **0101** | **0011** | 01000 |
| **0101** | **0100** | 01001 |
| **0101** | **0101** | 01010 |
| **0101** | **0110** | 01011 |
| **0101** | **0111** | 01100 |
| **0101** | **1000** | 01101 |
| **0101** | **1001** | 01110 |
| **0101** | **1010** | 01111 |
| **0101** | **1011** | 10000 |
| **0101** | **1100** | 10001 |
| **0101** | **1101** | 10010 |
| **0101** | **1110** | 10011 |
| **0101** | **1111** | 10100 |

**A diagram of a circuit

Description automatically generated**