Lab 03

**Exercise 1:**

|  |  |  |
| --- | --- | --- |
| Ox | Input Binary | Output Binary |
| 0 | 0000 | 0000 |
| 1 | 0001 | 0001 |
| 2 | 0010 | 0010 |
| 3 | 0011 | 0011 |
| 5 | 0101 | 0101 |
| A | 1010 | 1010 |
| B | 1011 | 1011 |
| C | 1100 | 1100 |
| D | 1101 | 1101 |
| E | 1110 | 1110 |
| F | 1111 | 1111 |

Diagram

Description automatically generated with medium confidence

**Exercise 2:**   
**Name one crucial role (hardware) counters play in modern computing architectures?**

Hardware counters are set of counters.  
**Describe in a few sentences how a ripple counter works. How does the “ripple” oc-  
cur ?**

Ripple is a special type of asynchronous counter to make the clock pulse ripples through the circuit

**Exercise 3:**

Diagram

Description automatically generated

**Exercise 4:**

Diagram

Description automatically generated

**Exercise 5:**

Diagram

Description automatically generated

**Exercise 6:**

Diagram

Description automatically generated

**Exercise 7 + 8:**

Diagram

Description automatically generated