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# Gates memory

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## D-Latch

<b>Inputs:</b>	 Data Clk
<b>Outputs:</b>	 Out
<b>Description:</b>	The D-Latch will keep updating as long as its Clk input is positive. It outputs whatever value is currently stored.

## Latch (Edge triggered)

<b>Inputs:</b>	 Data Clk
<b>Outputs:</b>	 Out
<b>Description:</b>	The Latch is Edge-Triggered, meaning that it only stores the value when the Clk input changes from 0 to positive. In order to change the data stored, the Clk input must go back to zero or negative and then back to positive. The Latch will output whatever value is currently stored.

## RAM

<b>Inputs:</b>	 Data AddrRead AddrWrite Clk Reset
<b>Outputs:</b>	 Out
<b>Description:</b>	These memory chips works like a row of data, where you specify the address you want to write to (and the address you want to read from).

Remember: The row starts with zero: 0, 1, 2, 3, 4 and so on. This concept is very similar to arrays in programming.

## RS-Latch

<b>Inputs:</b>	<b>N</b> S R
<b>Outputs:</b>	<b>N</b> Out
<b>Description:</b>	SR is short for "Set-Reset". The chip keeps the first value input to S. When R is positive, the value of S is reset.

## SR-Latch

<b>Inputs:</b>	<b>N</b> S R
<b>Outputs:</b>	<b>N</b> Out
<b>Description:</b>	Same as RS-Latch, The difference is that each input has to 0 in order for the other to work.


## Toggle (Edge triggered)


<b>Inputs:</b>	<b>N</b> Clk OnValue OffValue
<b>Outputs:</b>	<b>N</b> Out
<b>Description:</b>	This chip toggles between two values when its Clk input is positive. Its OffValue and OnValue inputs specify these two values. Like the Latch, the Toggle chip is also Edge-Triggered. When created, the Toggle chip begins Off.

## Toggle While(Edge triggered)

<b>Inputs:</b>	<b>N</b> Clk OnValue OffValue
<b>Outputs:</b>	<b>N</b> Out
<b>Description:</b>	This chip toggles between two values when its Clk input is positive. Its OffValue and OnValue inputs specify these two values. Like the Latch, the Toggle chip is also Edge-Triggered. When created, the Toggle chip begins Off. As addition While has to be 1 in order to toggle to the OnValue.

## Up/Down Counter


**Inputs:**  Clk Increment Decrement Reset

**Outputs:**  Out

**Description:** When Clk is triggered, outputs 1 when Increment is 1, outputs 0 when Decrement is 1. Doesn't do anything when Increment and Decrement are equal.

## Write Only Memory(4 store)

**Inputs:**  Data AddrWrite Clk

**Outputs:**  Out

**Description:** Use this gate to store secret data which you don't want anyone to read, including yourself.

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