



PROXIMA

A Virtual Space Agency

TUTORIAL #1

Control Logic for blinking an LED



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BASIC OPERATIONS

Here's a list with the basic operations you'll need in order to work on your missions.

Add block to diagram

Drag block from palette into the diagram.

Select block

Click on the block you want to select.

Cancel Selection

Use ESC to cancel the current selection.

Delete block

Click on the block you want to delete, then click BACKSPACE.

The selected block and all of its connections will be deleted.

Connect Pins

Click on one of the pins then drag the connection and click on the pin you want to connect to.

Input pins can be connected to only one output pin; output may be connected to multiple inputs.

Delete Connection

Click on the pin that has the connection you want to delete.

Warning: all wires connected to that pin will be deleted.



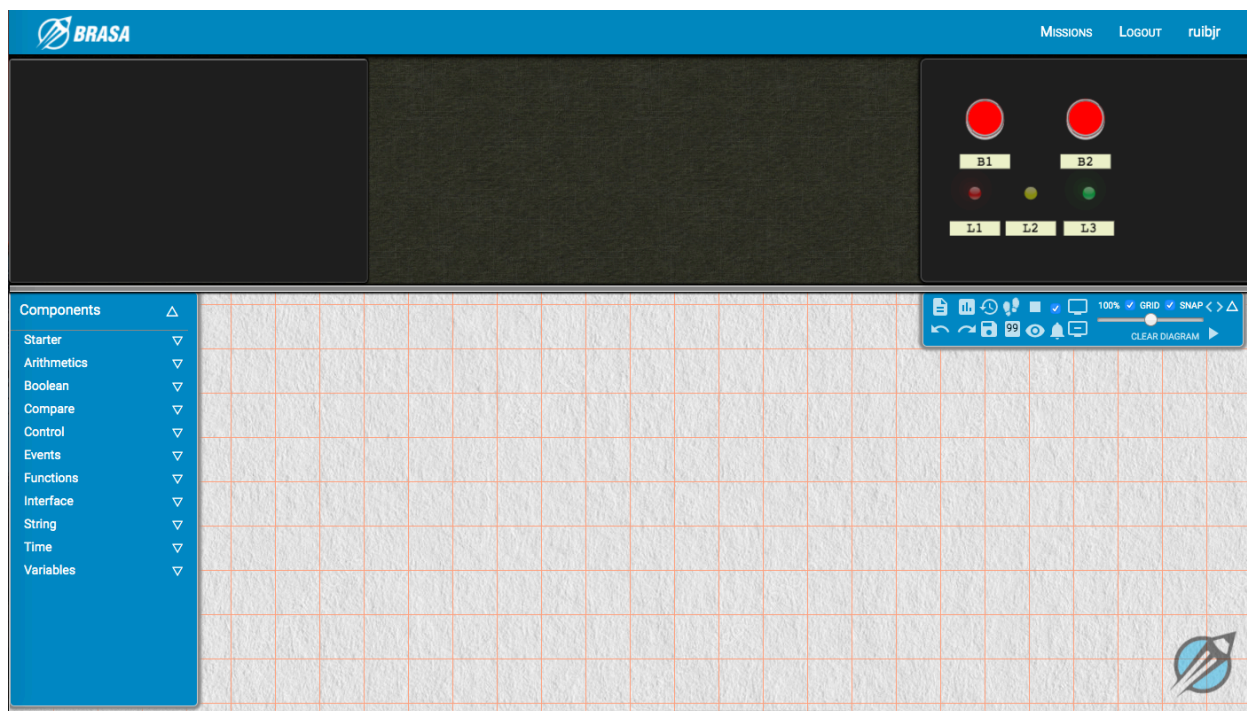
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So, let's do this!

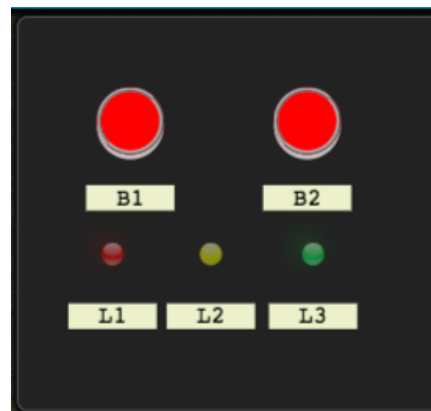
First Step: Chose the Mission you want to create the control logic for - in this example, we'll chose "TEST-LAB".

This Mission is a "playground" where you can build experiments and get used to how Logic Blocks work.



In this tutorial, we will show you how to build the control logic to blink an LED.

In order to build our solution, we'll be using the components that are available in the dashboard area - in this tutorial, we are going to use one LED, namely "L1".





Control Logic for blinking an LED

We are going to select the logic blocks from the Blocks Palette. This palette contains all the available blocks, organized by category - such as arithmetics, interface, variables, etc.

Components	△
Starter	▽
Arithmetics	▽
Boolean	▽
Compare	▽
Control	▽
Events	▽
Functions	▽
Interface	▽
String	▽
Time	▽
Variables	▽



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Now we are going to need the “Start” logic block.
This block is activated by the platform when we run the simulation.
You will find the “Start” block by clicking on the “Starter” category
and scrolling down a bit.

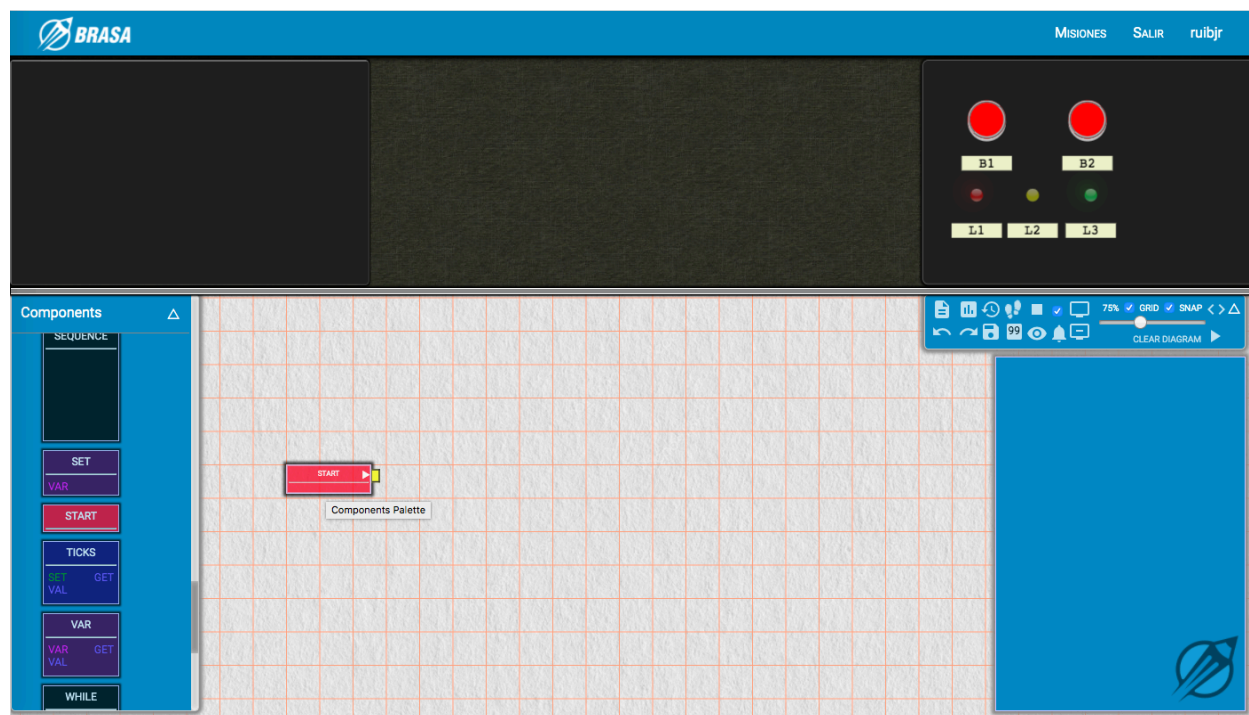




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In order to use that block in your control diagram, all you have to do is drag it into the place where you want it, in the empty diagram area.



Now, we choose which LED we are going to blink.
In this tutorial, we are going to blink the red LED,
called "L1".

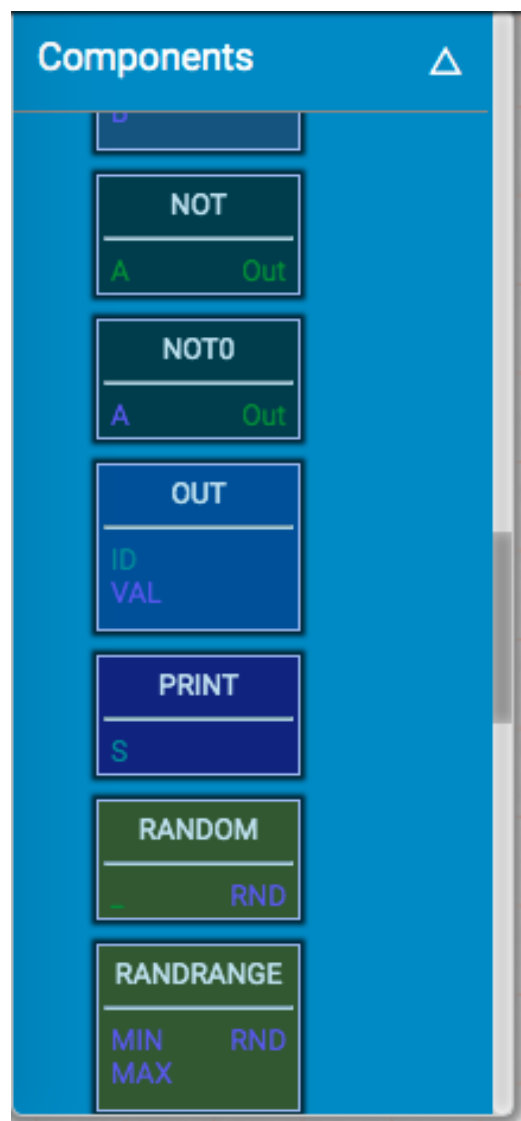




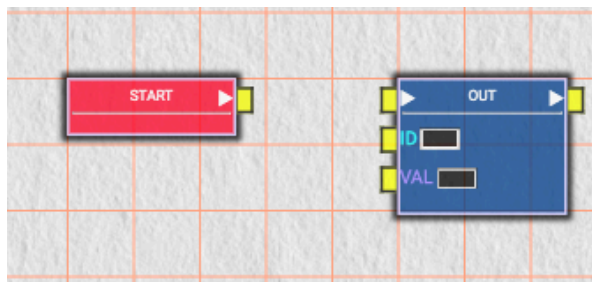
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We use the “OUT” block to send out a control signal to the desired component.



Drag the “OUT” block into the diagram.





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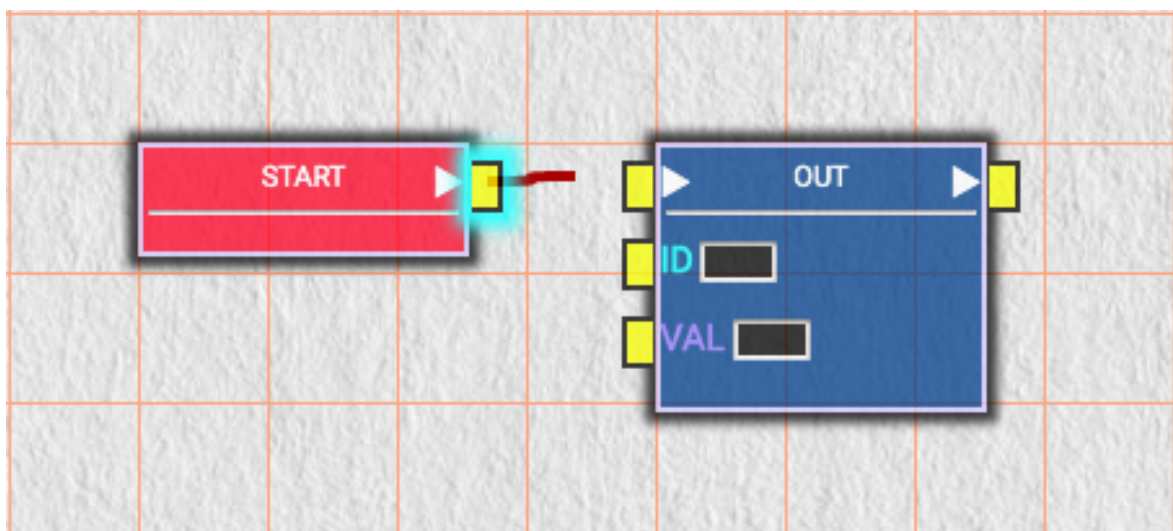
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Now we need to connect the “START” block to the “OUT” block.

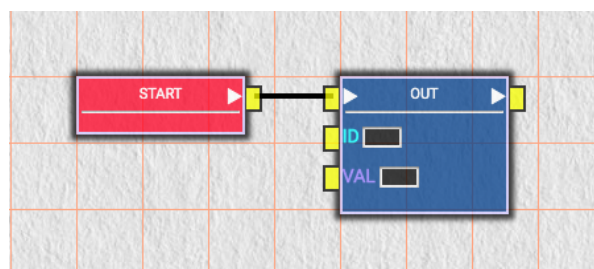
The “triangle” pin on the left of any block is its “trigger” - whenever this pin is activated, that block performs its function.

The triangle pin on the right of a block is its “chain” pin - when the block finishes performing its function, it activates the block whose trigger is connected to the chain.

The “START” block does not have a trigger pin, because it is automatically triggered when the simulation starts; besides, it does not perform any action, so its sole function is to activate the first block in the chain when the simulation is started.



Your logic diagram should now look like this:



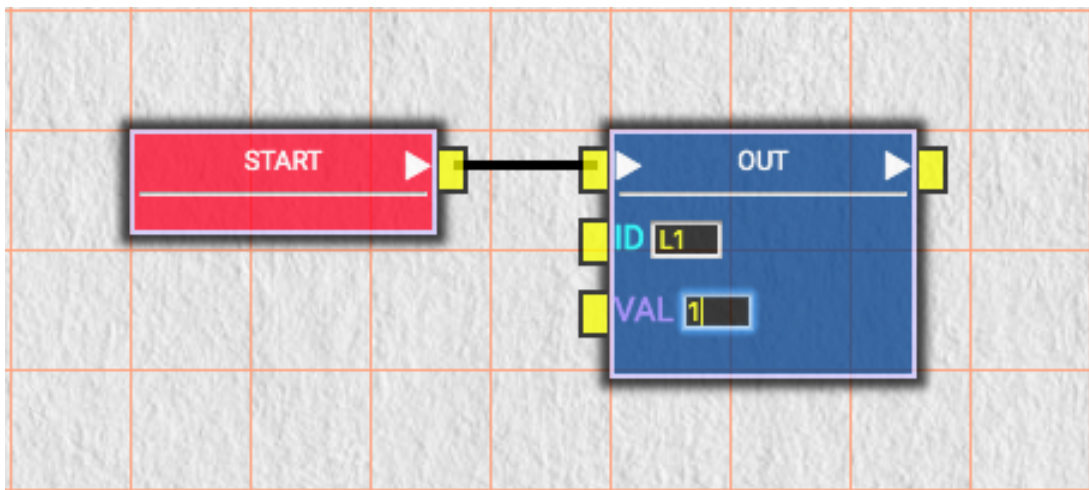


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You will notice that the “OUT” box has two small input fields, labelled “ID” and “VAL”.

So, you need to type in that information: enter the component name you want to send the signal to, into the “ID” field, then type in the signal you want to send. We want to send the signal to “L1” (the red LED). And the signal we want to send is “1”, which means “TURN ON” (we would send “0” if we wanted to “TURN OFF”).



This is a complete solution.

A very small one, which does not do a lot, but it is a good starting point.

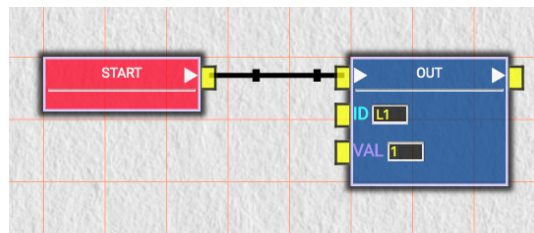
Here's what this diagram does: when the simulation starts, the “START” block triggers the “OUT” block, which in turn sends a “1” to “L1”.

In other words, when we run the simulation, LED “L1” is turned on.

So, let's run the simulation, by clicking on the “footprints” icon.



This starts the simulation:



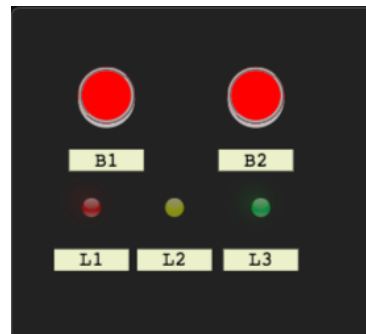


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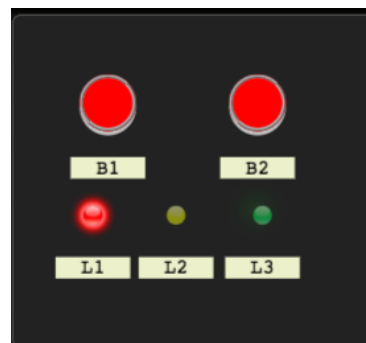
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And LED “L1” is turned on:

Before

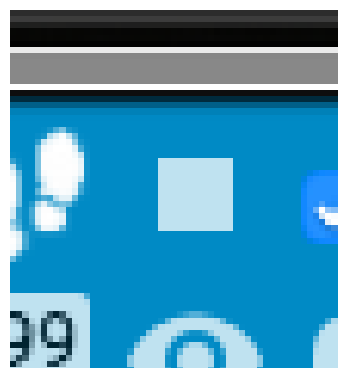


After



Perfect!

Now let's stop the simulation, so we can modify the control logic. To stop the simulation, click on the “stop” icon (the white square, next to the “footprints”):



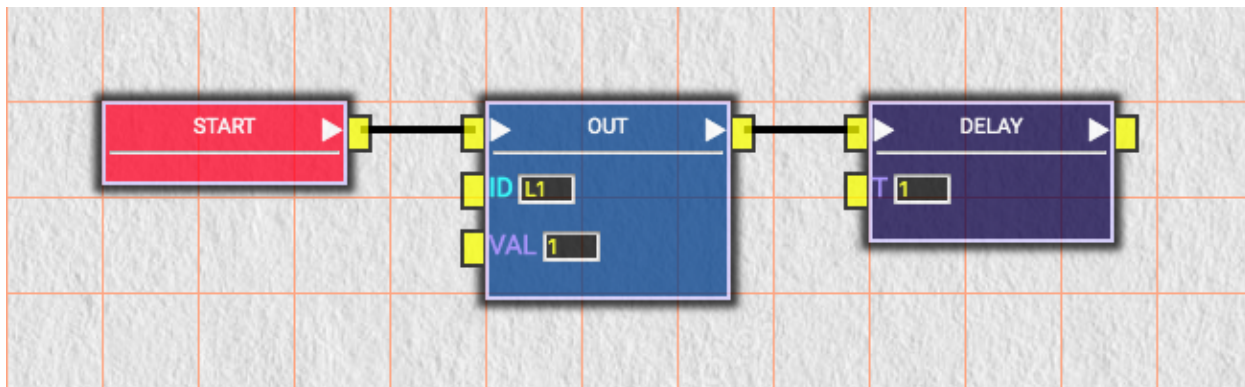


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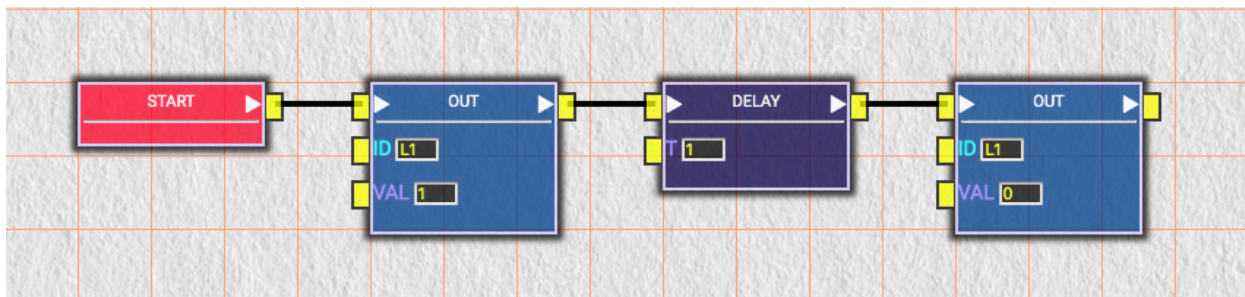
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Next, we add a connect a “DELAY” block, which has an input field where you enter the desired delay, in this case 1, for 1 second. And right after the delay, we add and connect another “OUT” block - but this time we send a 0 to “L1”, to turn KED “L1” off.

Add the DELAY block



Add another OUT block

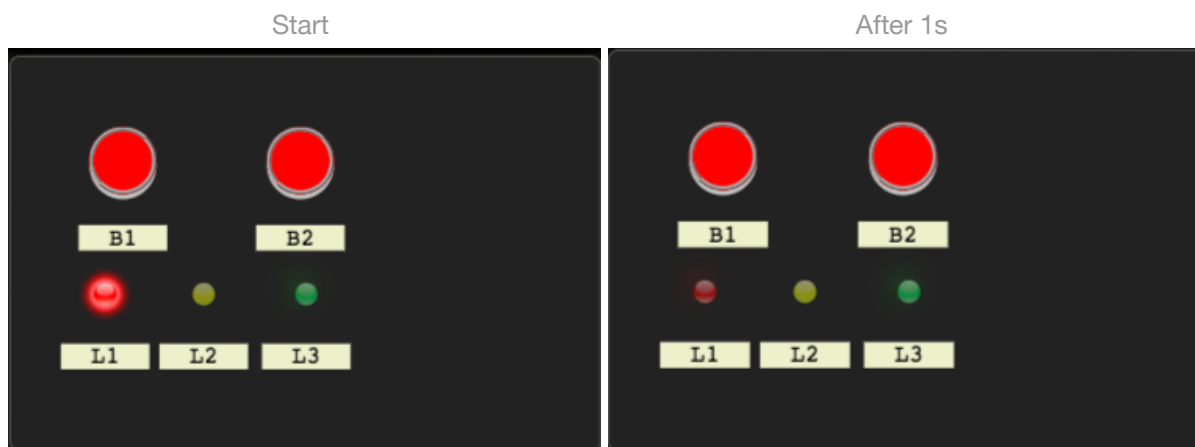




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And here's the result: when you run the simulation, the LED is turned on, then one second later it is turned o





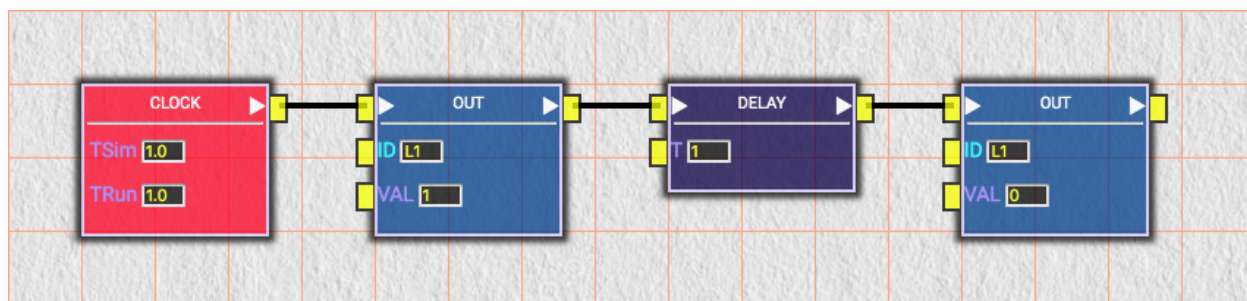
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But that's not the solution we're looking for.

What we really want is a blinking LED, cycling between ON and OFF every second.

To achieve that, all we need is to remove the "START" block and add the "CLOCK" block, as show below.

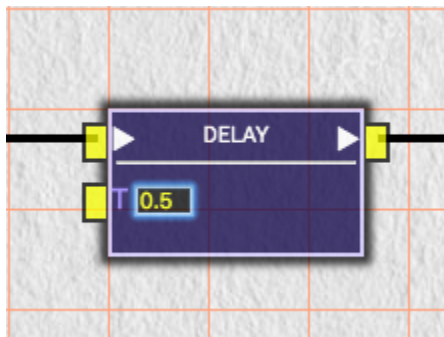


The "CLOCK" block is similar to "START", in the sense that it doesn't have a trigger, because it is automatically triggered by the platform.

The difference is that "CLOCK" is triggered every second - as opposed to "START", which is triggered only once, when the simulation is started.

Since we want the blinking cycle to be one second, we're going to keep L1 ON for half a second, instead of one second.

So, we change the "DELAY" time ("T" input) from 1 to 0.5.



Now when we start the simulation, the LED blinks with one second cycle: half a second ON and half a second OFF.



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Finally, let's save our diagram, by clicking on the "diskette" icon:



Next time you log in and open this mission, the last diagram is automatically loaded.

As a matter of fact, you can recover any of the last 20 versions, by clicking on the "clock" icon - this will show you the 20 last versions - you can load any of them by just clicking on the one you want to load.





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The platform keeps the last twenty versions that were saved.

Versions are identified by a screenshot (the area of the diagram that was visible on the screen when you clicked the “save” icon) plus a label indicating when it was saved (e.g. “2 hours ago”).

