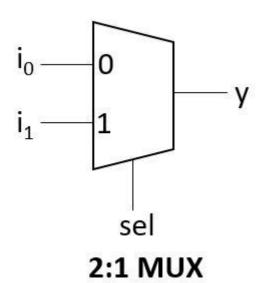
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Lab 10: Testbench coding

Goal of this lab is to code a testbench for a simple 2:1 multiplexer module, which is available at labs/lab10/src/mux.vhd. The interface of multiplexer are

Port	Direction	Туре
i0	IN	std_logic
i1	IN	std_logic
sel	IN	std_logic
У	OUT	std_logic



This is the truth table of the module

sel	У
0	i0
1	i1

Exercise 1. Basic Testbench

Go to the lab folder ~/labs/lab10/, and open the testbench file sim/tb mux.vhd

```
kate sim/tb_mux.vhd &
```

Design the testbench, following the instructions in the comments of the file. Once the testbench is ready, open the run_sim.sh file, and code the script as shown in the lecture.

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You can use either XSIM or GHDL, as you prefer.

Once you are done, run the simulation to test your testbench.

```
./run_sim.sh
```

Exercise 2. Self-Checking

Improve the testbench, by adding self-checking and pass/failing functionalities.

- Check the y output of the multiplexer
- Report errors when the expected behaviour is incorrect.
- Issue a final pass / fail message based on the results of the test.
 - Tip: You need an extra check in addition to the integrated assert function to keep track of errors.

Exercise 3. Write a Procedure

Improve the testbench, by adding a write procedure that sends the stimulus, check the results and update the error counts.