Speedy Debugging With Cocotb

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Intro

You may find it more useful to check a certain signal at a certain time step in your simulation without having view the waveform. This can be done with cocotb.

First make sure you have python3 installed

Ubuntu or Bash for Windows

```
$sudo apt install python3 python3-pip
pip3 install cocotb
```

MacOS

```
$brew install python3
$pip3 install cocotb
```

Running CocoTB

Change into the directory `python3-cocotb` and run `COCOTB_REDUCED_LOG_FMT=1 VCD=true make`. Cocotb will emit a lot of warnings because there are currently some uninitialized values in the MIPS module.

You'll notice in `MIPS_tb.py`, that we start by toggling clock ad-infinitum, and then the reset is dropped. The value of `read_register_2_address` is printed to the terminal hidden in a lot of warnings.

Finally, we check that `read_register_2_address` is equal to `2` at the third clock, and then exit cocotb. If this check fails, cocotb would issue an error - otherwise, cocotb will display `ERRORS : 0`.

Viewing the Resulting Waveforms

You can also view waveforms from Cocotb simulations with GTKWave by opening the resulting waveform in the directory `python-cocotb/sim_build/sim.ghw`.

Disabling Waveform Output

You can also have cocotb disable waveform output by running `COCOTB_REDUCED_LOG_FMT=1 VCD=false make`.

Known Limitations for Cocotb

Cocotb cannot currently access the data inside VHDL memories with Python. I am discussing with the maintainers of Cocotb to see if there is a solution.