## Exercise 04: *Saturation Filter* Walkthrough

***Objective:*** *Get familiarized with the existing testbench code and the commands to run tests.*

***Task:*** *Analyze the Saturation Filter testbench source code.*

### *Saturation Filter* walkthrough

The following steps will give a walkthrough of the *Saturation Filter* UVM testbench:

1. Go to the testbench directory, `<ROOT>/sat_filter/src/tb`, and check the code for the *Saturation Filter* UVM testbench.

   Check section **??** for a more detailed description of the testbench structure.

2. Run the default test case to familiarize with the flow and the `GTKWave` tool for waveform visualization:

   2.1 On the terminal, run the following command to execute the available test:

   ```
   (.venv) [<username>@<servername> tb]$  make MODULE=test_sat_filter_default_seq
   ```

   where, `test_sat_filter_default_seq` is the name of the available test inside the tests folder, `<ROOT>/sat_filter/src/tb/tests`.

   2.2 Open the `GTKWave` application and load the waves:

   ```
   (.venv) [<username>@<servername> tb]$  gtkwave sim_build/<waveform-name>.vcd
   ```

   replace `<waveform-name>` by the generated waves from the previous step.

   More information related with the `GTKWave`, can be found in the GTKWave user-guide.

   2.3 Read the `Makefile` available in `<ROOT>/sat_filter/src/tb` to check how the DUT parameters are set.

   2.4 Try to rerun the test by running the following command and check the waves again:

   ```
   (.venv) [<username>@<servername> tb]$ make clean && make
   MODULE=test_sat_filter_default_seq \
   DATA_W=16 THRESHOLD=8
   ```

   Look at the waveform again - What changed?