**1. s1423.bench**

**2. s5378.bench**

**3. s13207.bench**

**4. c2670.isc**

**5. I2C slave.v and spi\_slave.vhd**

**6. VGA controller**

**7. picorv32**

**8. industry2.yal industry3.yal**

Absolutely! Here are some free tools you can use for compiling, simulating, and visualizing circuits described in Verilog files:

**Verilog Compilation:**

* **Icarus Verilog (Windows, Linux, macOS):** This is a powerful and widely used open-source Verilog compiler and simulator. It supports most features of the Verilog language and can handle a wide range of designs.
* **GTKWave (Optional - waveform visualization):** While not a compiler, GTKWave is a free and open-source waveform viewer commonly used for visualizing signals generated during Verilog simulations. It works well with Icarus Verilog's output.

**Verilog Simulation:**

* **Icarus Verilog (mentioned above):** As mentioned, Icarus Verilog offers both compilation and simulation capabilities. It's a great option for simulating most of your Verilog circuits.

**Alternatives for Complex Designs:**

* **Cloud-based EDA Tools:** Some cloud platforms offer free tiers with Verilog simulation capabilities. These can be helpful for handling very large and complex circuits (e.g., Cadence Cloud EDA Free Trial).
* **Hardware Co-simulation with FPGAs:** You can explore using FPGAs (Field-Programmable Gate Arrays) for hardware co-simulation. This involves translating your Verilog design to an FPGA and interacting with it from your DeepRL model running on a computer. However, this approach has a steeper learning curve and might require access to FPGAs and development boards.

**Visualization (Alternatives to GTKWave):**

* **SignalTap (built-in with some simulators):** Some simulators, like Icarus Verilog, offer built-in waveform viewers like SignalTap.
* **Verilator (Optional - Waveform generation):** While not a simulator itself, Verilator translates Verilog code into C++ code, allowing you to use waveform viewers commonly used in C++ environments (e.g., gtkwave)