**Scenarios of bug-injection:**

Scenario 1: Writing Outside of FIFO Depth in FIFO\_Mem.

**fifo[b\_wptr[PTR\_WIDTH-1:0] % (DEPTH + 1)] <= data\_in;**

By using the above line, we are trying to write data to an invalid index, i.e., Out-of- bounds of the FIFO array. An error occurs while trying to simulate after introducing this error.

Scenario 2: Creating a bug that corrupts data during the write operation.

**fifo[b\_wptr[PTR\_WIDTH-1:0]] <= data\_in ^ 8'hFF;**

By using the above line, we are trying to induce “Data Corruption Bug”. During the write operation, the data is XORed with 8'hFF, which will invert all bits, leading to corrupted data.

Effects of bugs are reflected in the transcript.