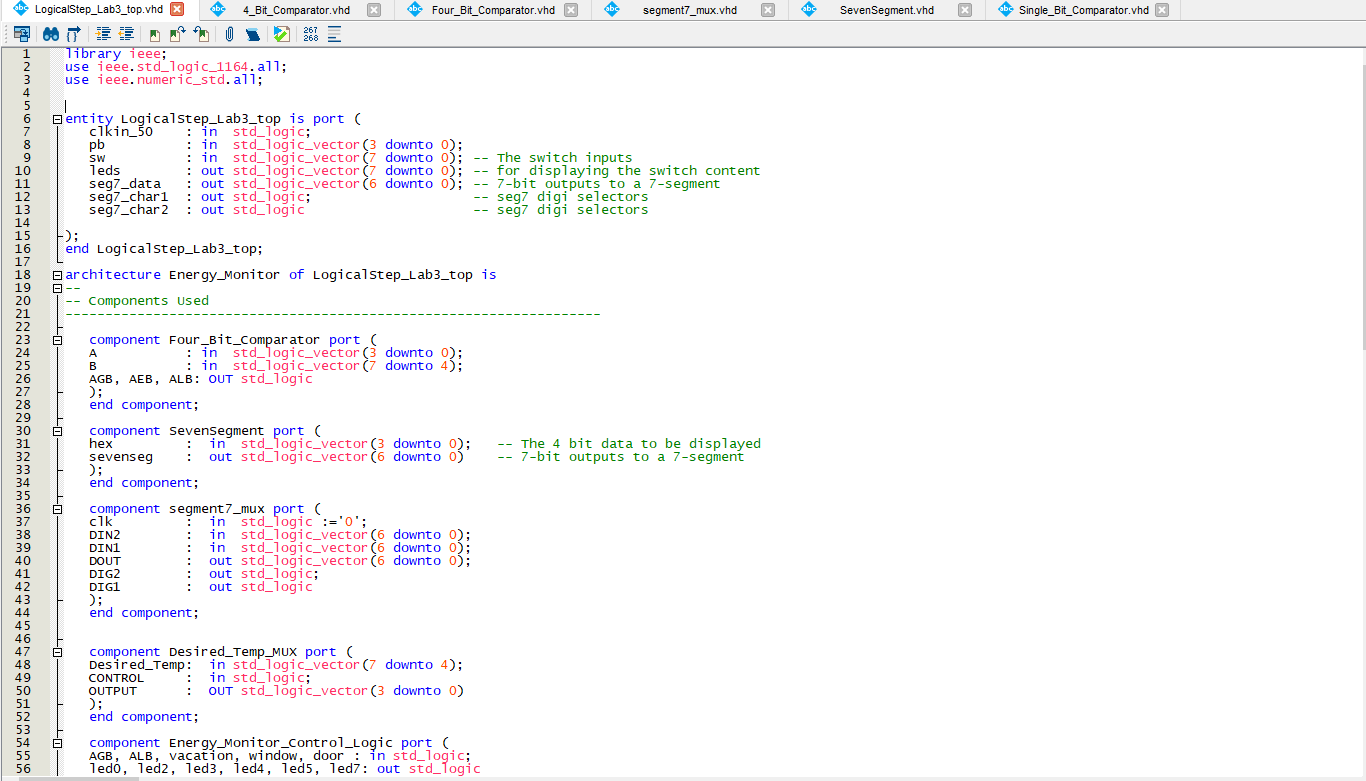
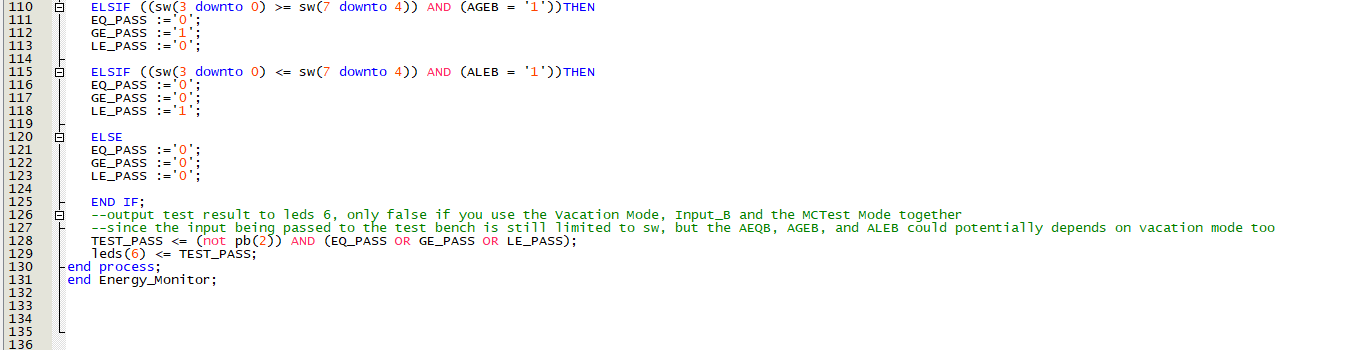
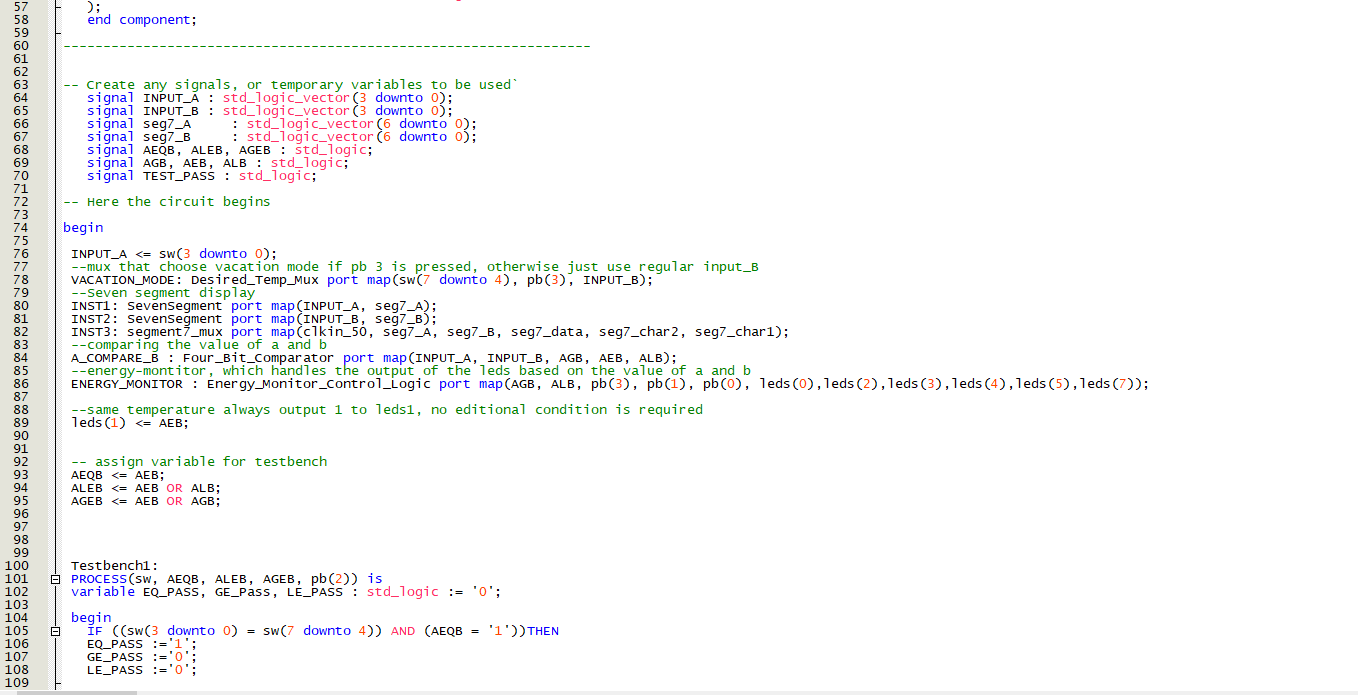
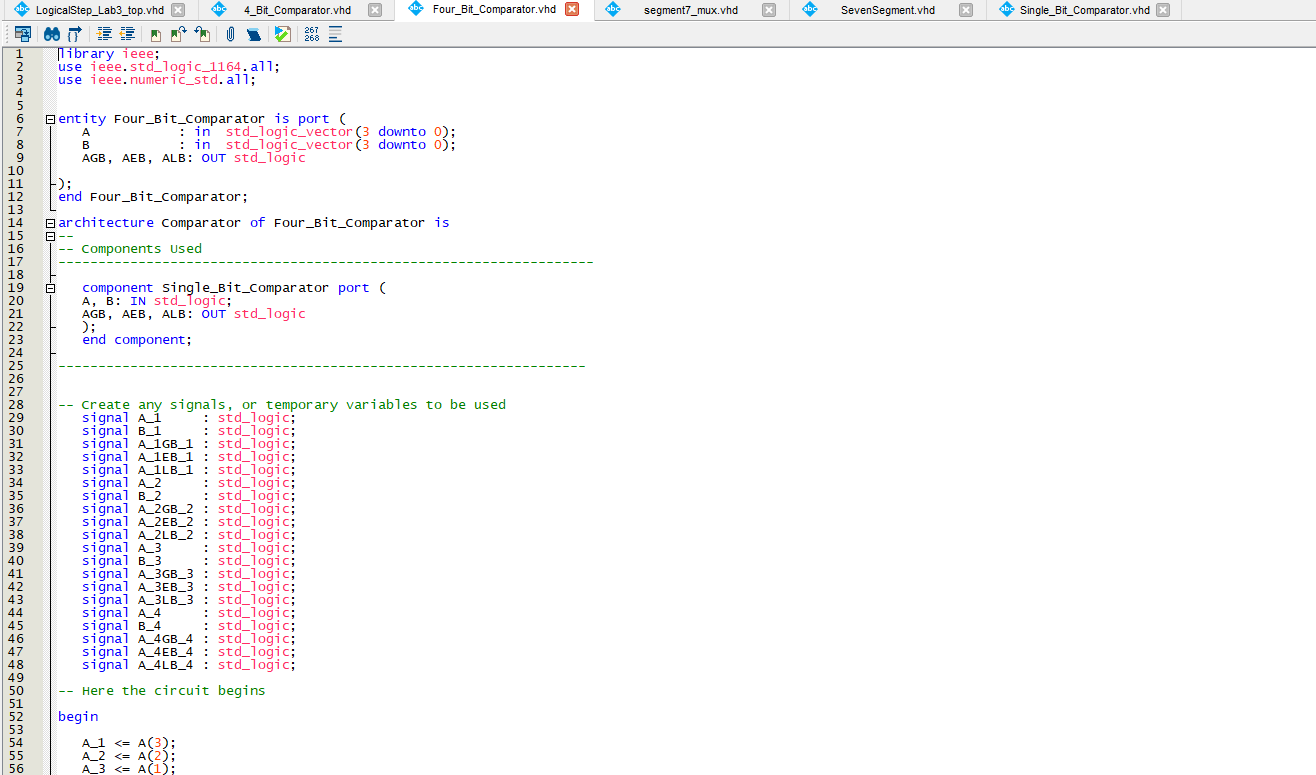
**LAB 3 Report**

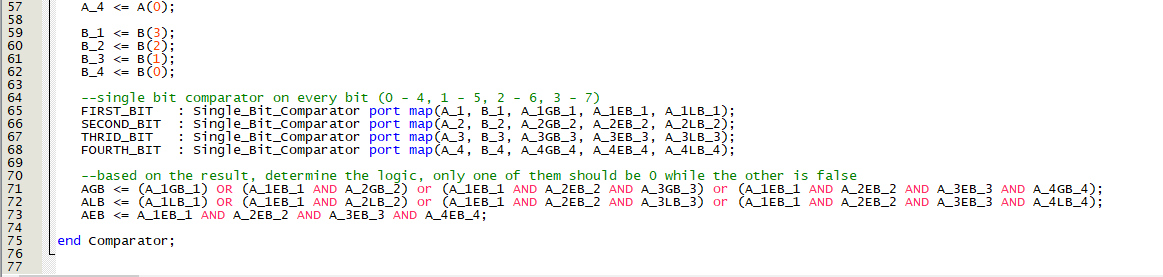
Ashish Natesh- 20788766

Justin Cai- xxxxxxx

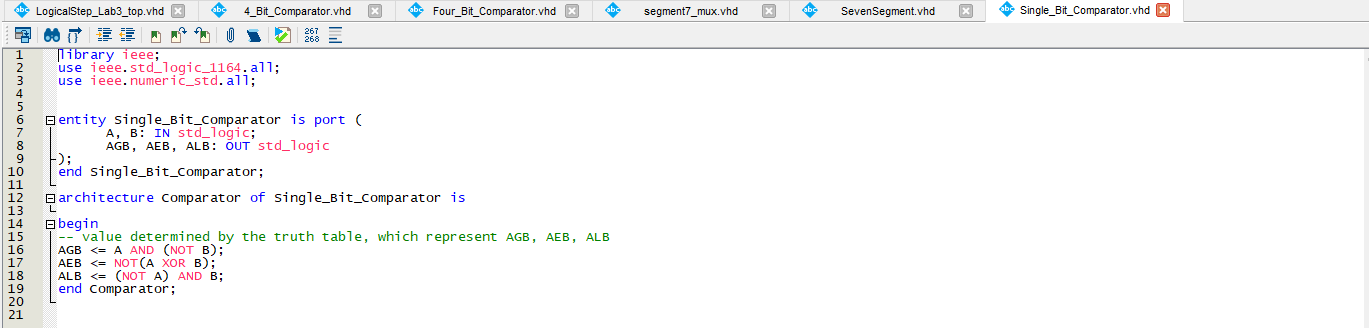
**Lab 3 Top file**

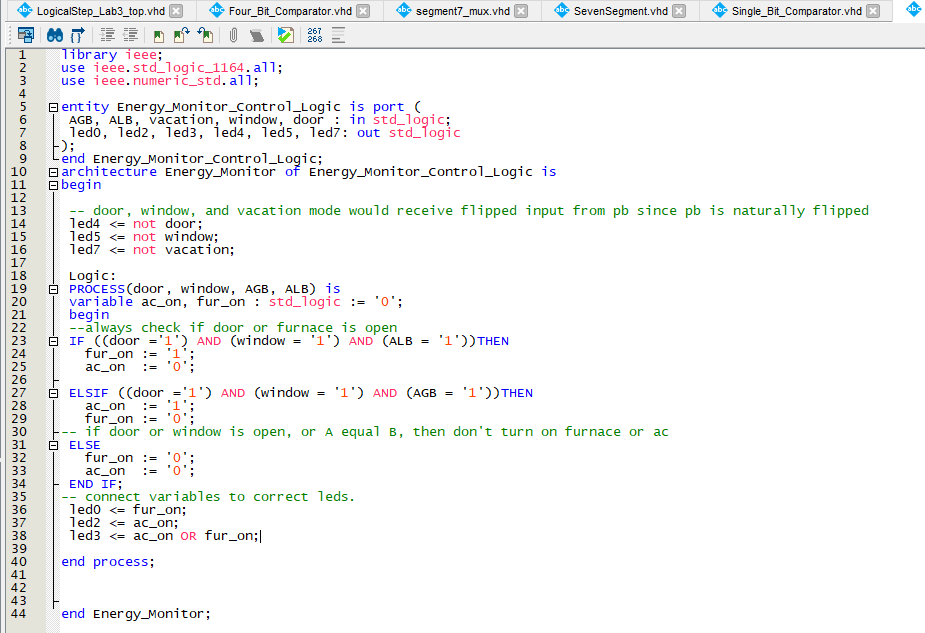


Four- bit Comparator file

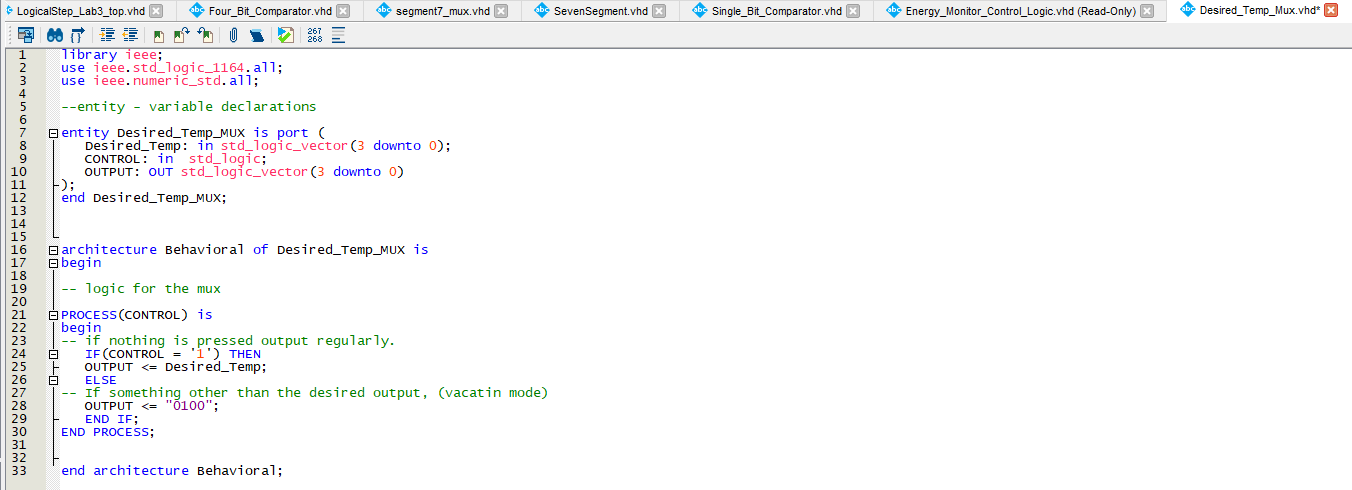


**Single-Bit Comparator file**



**Energy Monitor Control Logic File**

**Desired Temp Mux**

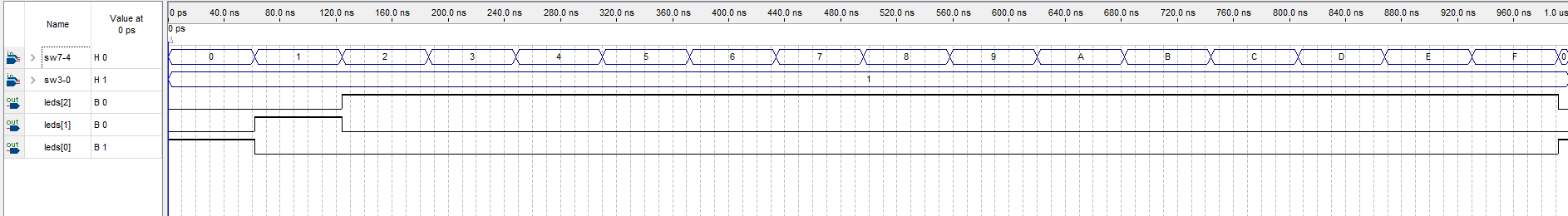


**Truth Table**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Comparison Inputs from 1 –Bit Comparators | | | | | | | | | | | | 4-Bit Comparator Outputs | | |
| A3<B3 | A3=B3 | A3>B3 | A2<B2 | A2=B2 | A2>B2 | A1<B1 | A1=12 | A1>B1 | A0<B0 | A0=B0 | A0>B0 | A<B | A=B | A>B |
| X | X | 1 | x | x | x | x | x | x | x | x | x | 0 | 0 | 1 |
| 1 | x | X | x | x | x | x | x | x | x | x | x | 1 | 0 | 0 |
| x | 1 | x | x | x | 1 | x | x | x | x | x | **x** | 0 | 0 | 1 |
| 0 | 1 | 0 | 1 | x | x | x | x | x | x | x | X | 1 | 0 | 0 |
| 0 | 1 | 0 | x | 1 | x | x | x | 1 | x | x | x | 0 | 0 | 1 |
| 0 | 1 | 0 | x | 1 | x | 1 | x | x | X | X | X | 1 | 0 | 0 |
| 0 | 1 | 0 | x | 1 | x | x | 1 | x | x | x | 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | x | 1 | x | x | 1 | x | 1 | x | x | 1 | 0 | 0 |
| x | 1 | x | x | 1 | x | x | 1 | x | x | 1 | x | 0 | 1 | 0 |

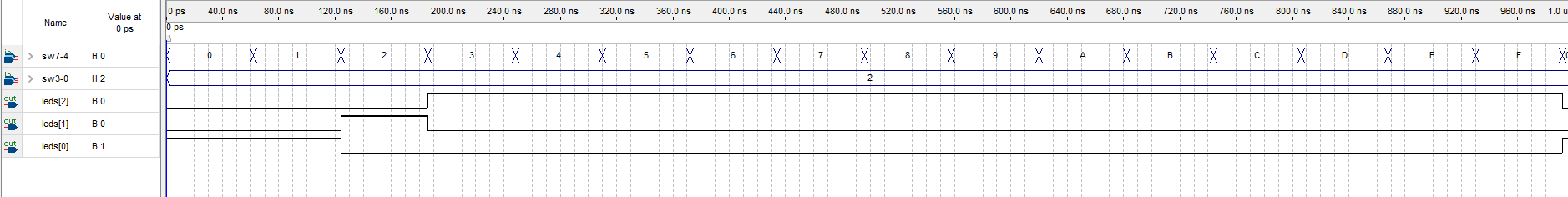
**Waveform Simulations**

When Input A = 1

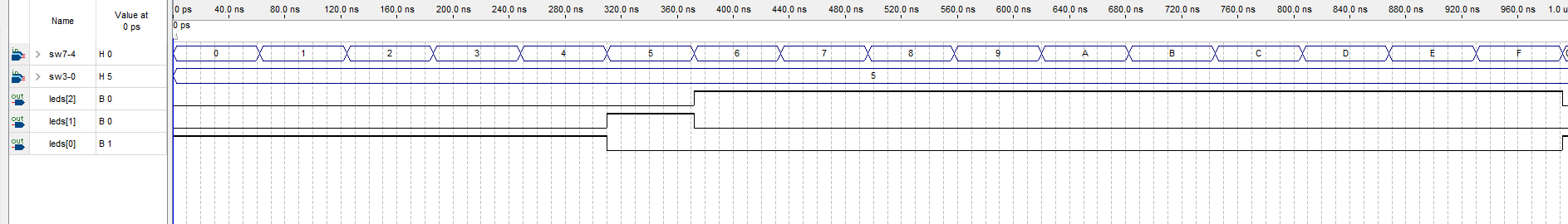


In this simulation, it can be seen that, when input A > B (1>0) , led(0) is on, when A=B(1=1), led(1) is one and when A<B (1<2,…,f) led(2) is on.

When Input A = 2

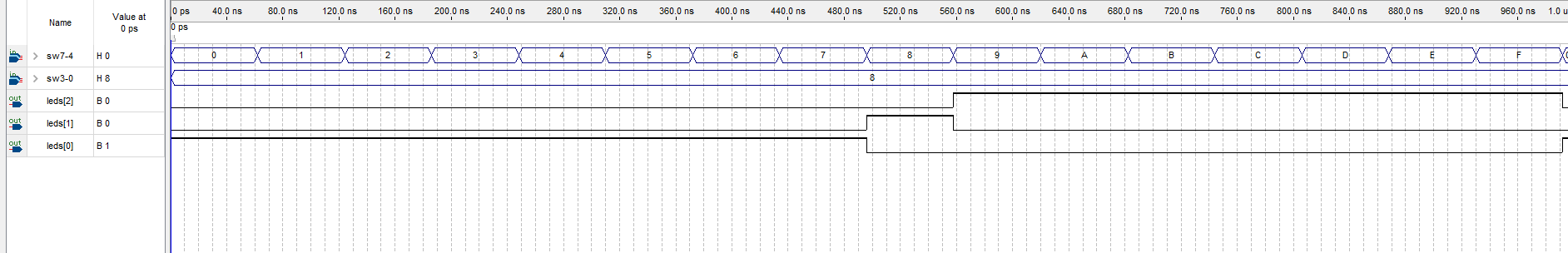
In this simulation, it can be seen that, when input A > B (2>0),1 , led(0) is on, when A=B(2=2), led(1) is one and when A<B (2<3,…,f) led(2) is on. 

When input A =5



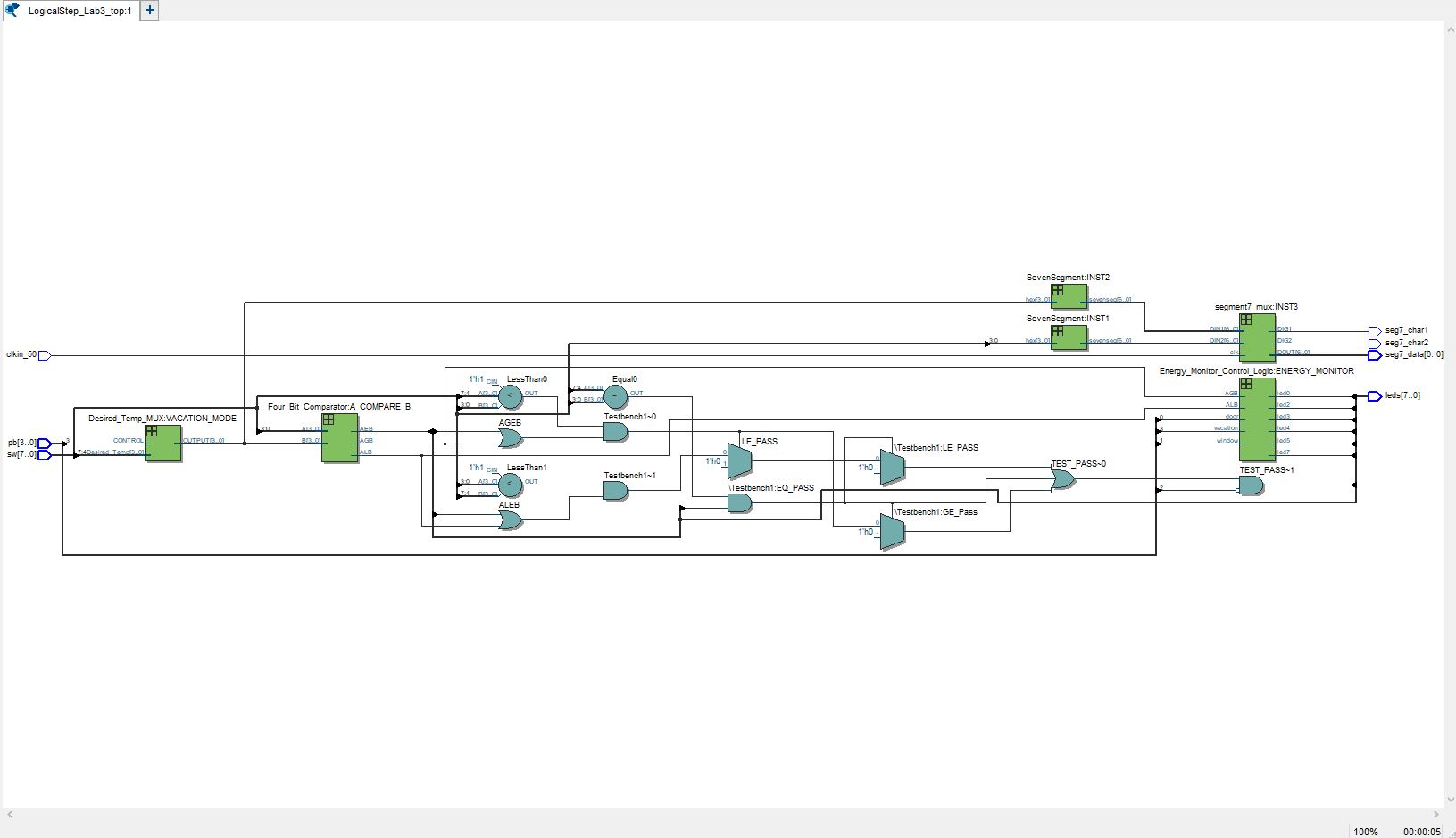
In this simulation, it can be seen that, when input A > B (5>0,…,4) , led(0) is on, when A=B(5=5), led(1) is one and when A<B (5<6,…,f) led(2) is on.

When input A = 8



In this simulation, it can be seen that, when input A > B (8>0,…,7) , led(0) is on, when A=B(8=8), led(1) is one and when A<B (8<9,…,f) led(2) is on.

**RTL Viewer for the Top file**



**Compilation report**

