## CS303 Logic & Digital Design Term Project

A Simple Phone Conversation

Design

To imitate a simple one-sided phone conversation, 6 states are used.

1) Simply, machine starts working while it is in the IDLE state and there is a startCall input given.
2) After that, machine moves to the RINGING state, and it waits for answerCall or endCall inputs.
3) If there is no input given for 10 clock cycles, machine moves to the BUSY state and displays "BUSY" statusMsg for 10 clock cycles.
4) If endCall action is taken while the machine on the RINGING state it goes to the REJECTED state and displays "REJECTED" statusMsg for 10 clock cycles.
5) If answerCall action is taken while the machine on the RINGING state it goes to the CALLER state and starts waiting for sendChar inputs until endCall action is taken or 'DEL' char is given as the input.
6) After the call is ended via one of the above-mentioned methods, it moves to COST state and displays the total cost of the call that took place in hexadecimal format for 5 clock cycles then, moves to the IDLE state.
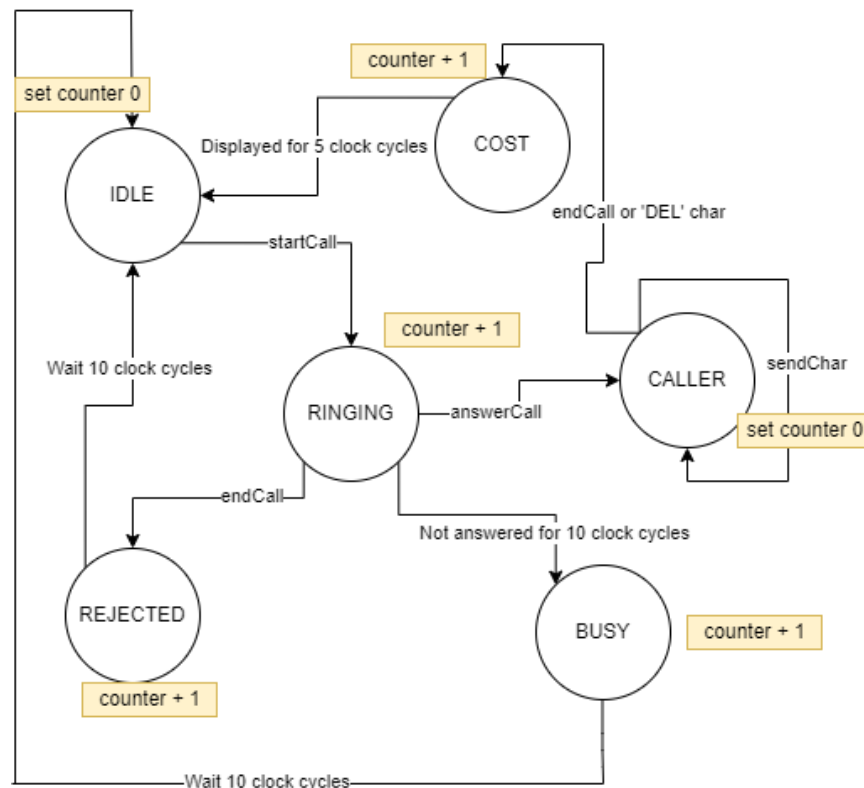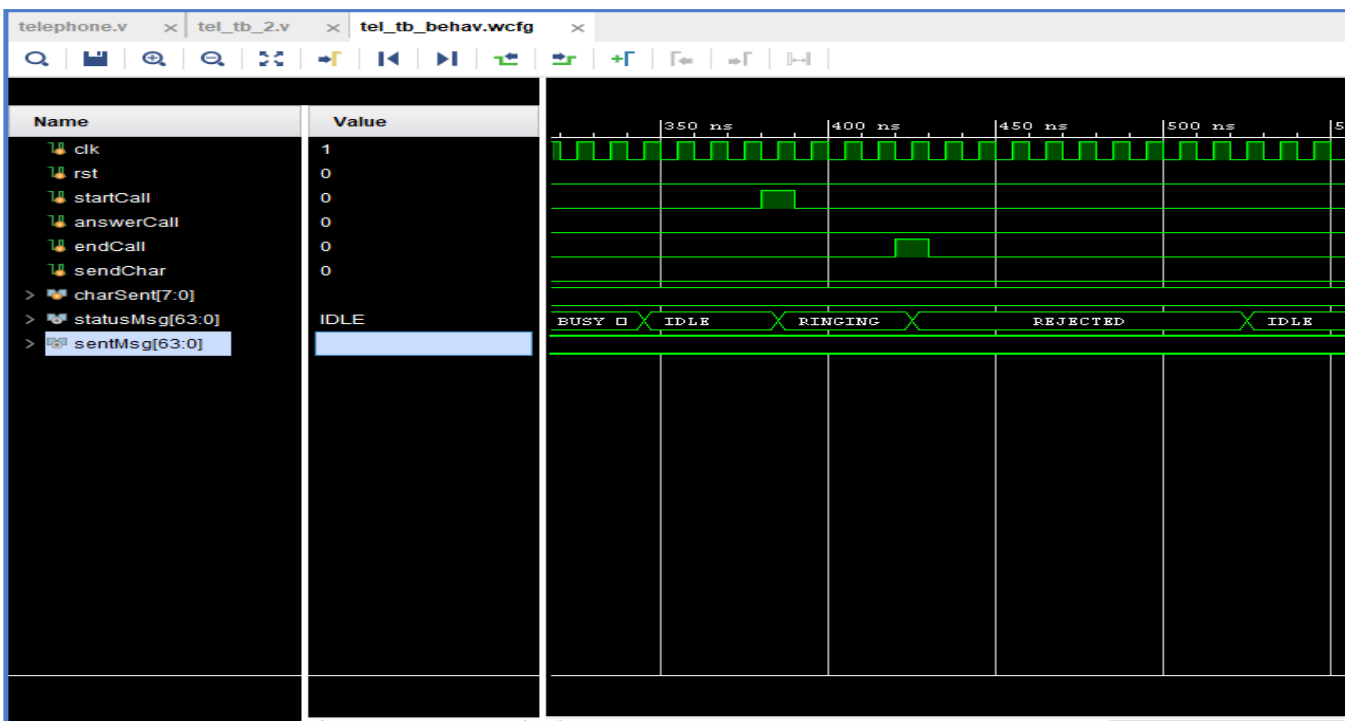
Simulation

a. Transition from IDLE state to RINGING state after startCall input. After waiting 10 clock cycles for an action, machine goes to the BUSY state and wait for 10 more clock cycles to move IDLE state back.
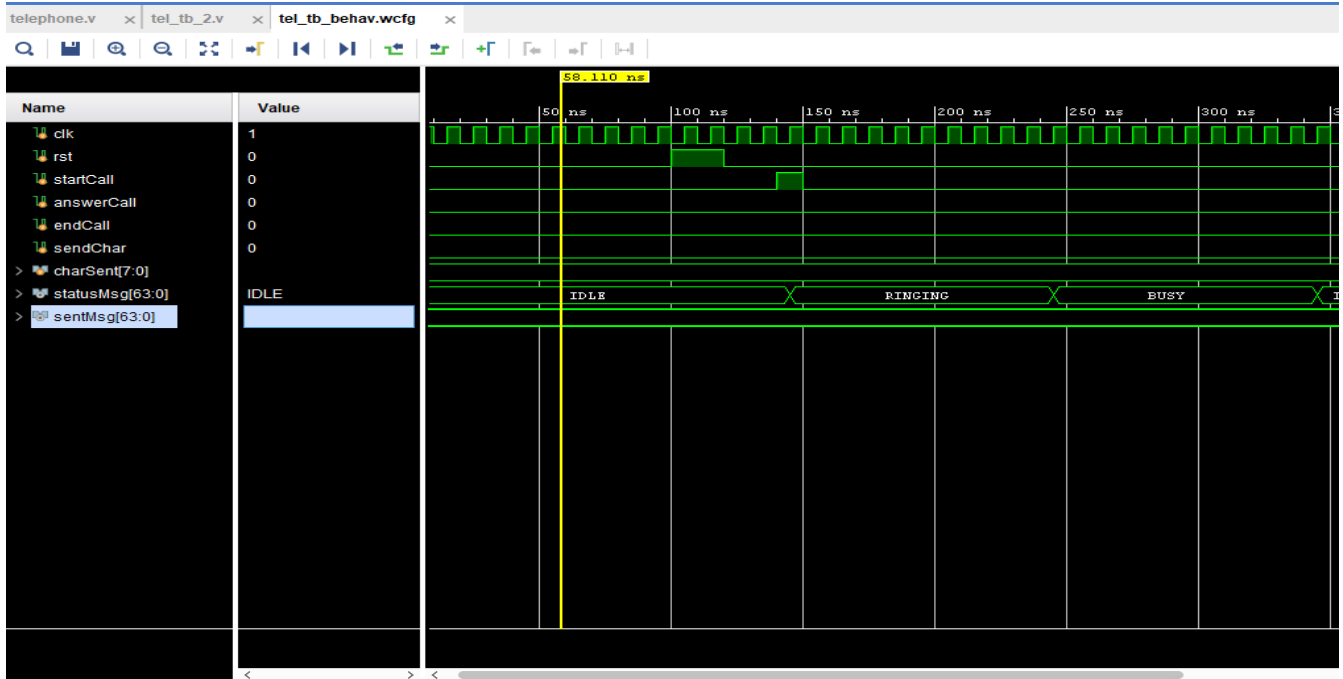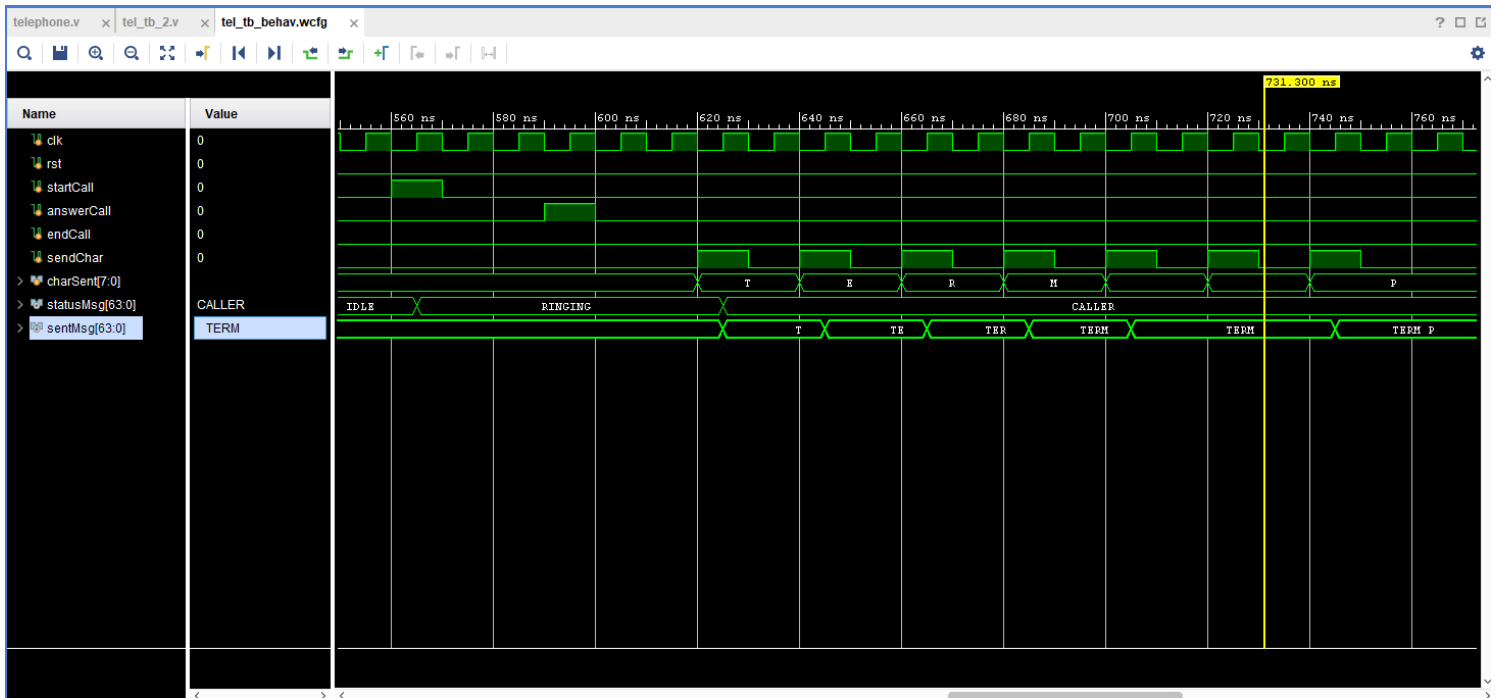

b. Machine moves to REJECTED state from IDLE state when takes endCall input.

After displaying REJECTED statusMsg for 10 clock cycles, moves to the IDLE state

c1. When machine takes answerCall input while it is on the RINGING state, machine moves to CALLER state and start takes inputs via sendChar and displays the given inputs as sentMsg.

c2. CALLER state takes 'DEL' char from the sendChar input and moves to COST state and displays the cost of the session in hexadecimal form for 10 clock cycles and moves to IDLE state.
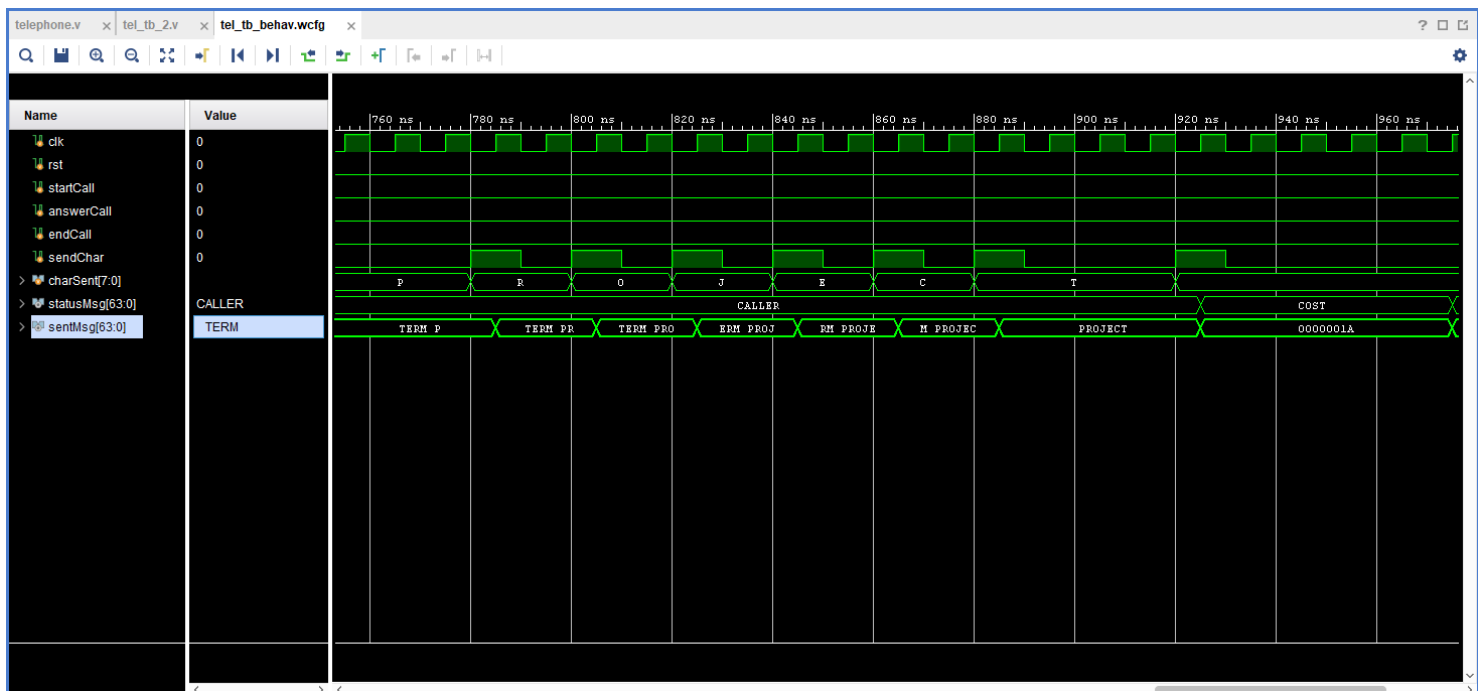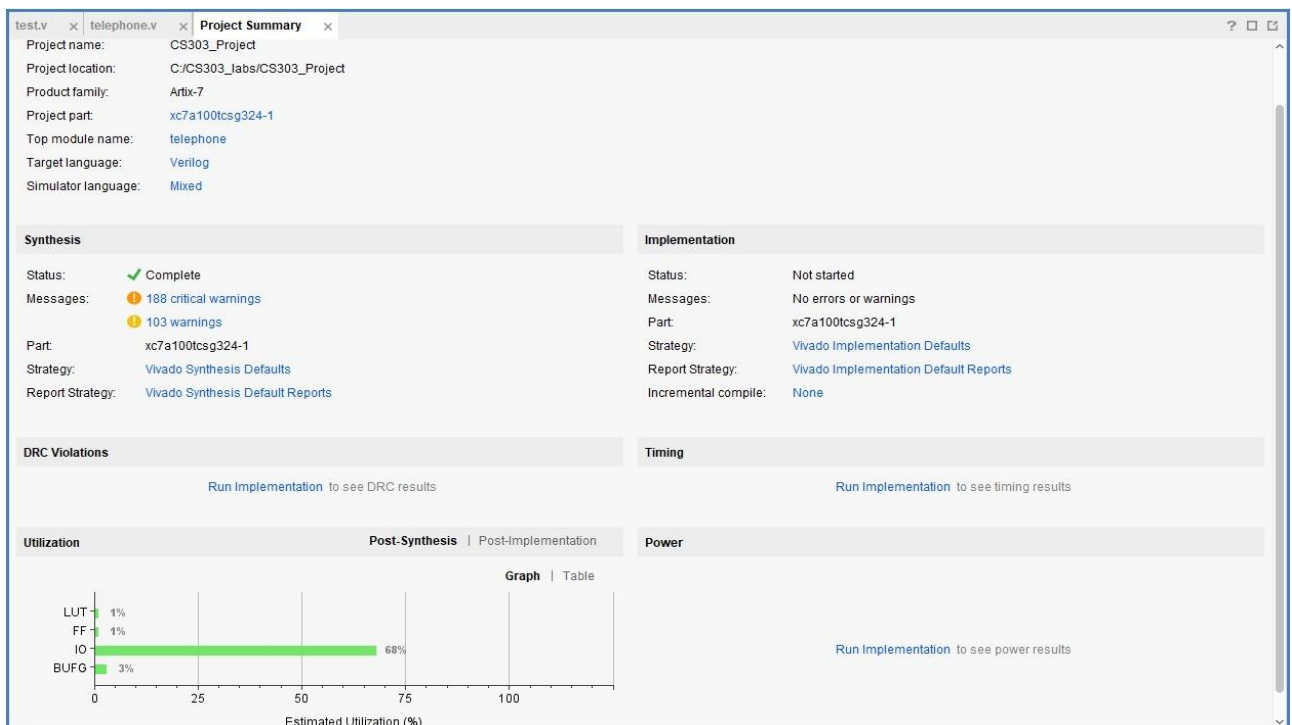
c3. In this case, CALLER state is ended via endCall input and moves to COST state.
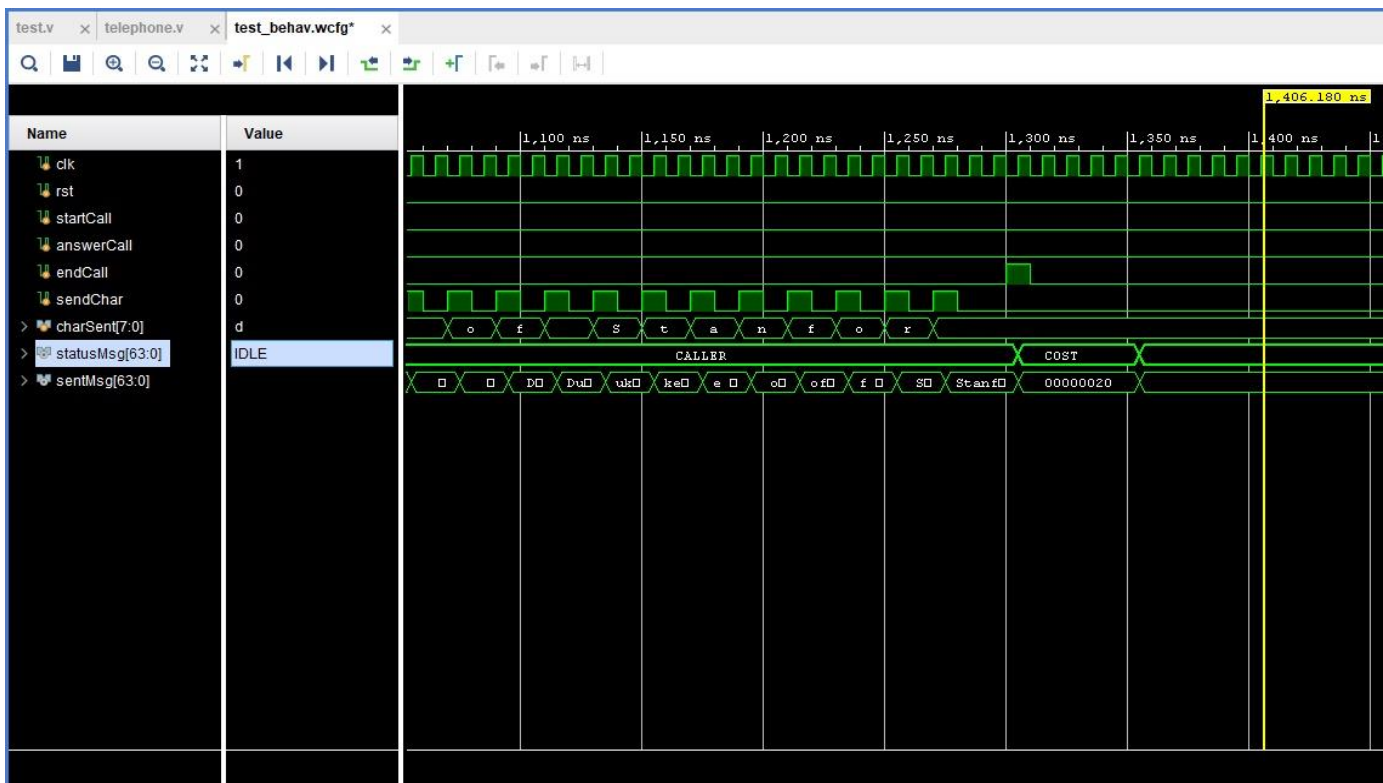
Synthesis

a.

b.

Utilization   **Post-Synthesis** | Post-Implementation

Graph | **Table**

Resource	Estimation	Available	Utilization %
LUT	39	63400	0.06
FF	48	126800	0.04
IO	142	210	67.62
BUFG	1	32	3.13