**CSE460 Lab Assignment 1**

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**Problem 1:**

**Code:**

**Graphical user interface, text, application

Description automatically generated**

**Compilation Report:**

Graphical user interface, application

Description automatically generated

**Simulation Report:**

**Graphical user interface, application

Description automatically generated**

**Graphical user interface, application

Description automatically generated**

**Explanation:**

The counter is incrementing, or decrementing value based on the up\_down variable. When we set the value of up\_down to 1 it is (up count) starting from 1 and incrementing the value till 9 after that it is again starting from 1. When we set the value of up\_down to 0 it is (down count) starting from 9 and decrementing the value till 1 after that it is again starting from 9.

**Problem 2:**

**Code:**

Graphical user interface, text

Description automatically generated

**Compilation Report:**

**Graphical user interface, application

Description automatically generated**

**Simulation Report:**

**Graphical user interface, application

Description automatically generated**

**Explanation:**

This is 4 to 1 priority encoder where the top priority is in w0 among w3, w2, w1, w0. So, for this case it will be 4’bxxx1 meaning all the other bits are don’t care except w0. We also can see in our simulation report that when only w0 is 1 and whatever the other values are, the output will be 0. For next case the priority is w1 so w0 will be 0 and others will be don’t care representing 4'bxx10. We also can see in our simulation report that when only w1 is 1 and whatever the w2 and w3’s values are, the output will be 1. After that the priority is on w3, so w0 and w1 will be 0 and w2 will be don’t care representing 4'b1x00. Finally for priority of w2 all the other bits will be 0 representing 4’b0100.

**Problem 3:**

**Code:**

**Graphical user interface, text, application, email

Description automatically generated**

**Compilation Report:**

**Graphical user interface, text

Description automatically generated**

**Simulation Report:**

**Graphical user interface, application

Description automatically generated**

**Explanation:**

Here we are making 8:1 multiplexer by using 7 2:1 multiplexers. Firstly, the inputs are going to 4 2:1 multiplexers using first select pin. Then those 4 outputs are entering into 2 2:1 multiplexer and using second select pin and finally the 2 outputs are going to a 2:1 multiplexer and it is using third select pin.