

Technology-enhanced Learning - Activity Plan

Name: *Mansour Assaf*

Grade / Course: *EE 222 / Introduction to Digital Logic Design*

Length of Activity: *180 minutes*

Lesson Summary:

After studying logic design concepts from formal lectures, students are required to attend the laboratory to acquire hands-on design skills. Through the laboratory work, students will develop digital logic circuit design skills by conducting software lab exercises which are important for the engineering profession. They will gain problem-solving skills for analyzing digital circuit design problems, synthesizing and evaluating design information.

Lesson Objective:

To provide students with an opportunity to learn and master design and verification of digital logic circuits using open-source software such as Logicly and Logisim. The interactive Logisim software can be used to get students' attention and also demonstrate the functionality of the logic circuits. The Logicly simulation tool can help students identify and correct logic design errors earlier in the design flow, and reduce hardware design iterations before students build real hardware circuits on breadboards.

Resources/Technology – Teacher

Interactive Whiteboard

Computer Desktop

Online Resources/Tools

- <http://iiscs.wssu.edu/drupal/node/2320> “Fundamentals of Digital Logic Design”
- <http://logic.ly/> “Teach logic gates & digital circuits effectively - with Logicly”
- <http://www.cburch.com/logisim/> “Logisim - a graphical tool for designing and simulating logic circuits”

Resources/Technology – Students

Computer Lab/Student Laptop

Access to the Internet

breadboard kit, Function generator, Multimeter, Oscilloscope, Frequency meter, wires, LEDs, Logic gate chips, pliers and screwdrivers set.

Online Resources/Tools

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Intended Learning Outcomes

- Students will learn to use Logicly and Logisim open-source software for digital circuits design by students of first and second-year university students of Electrical, Computer Engineering undergraduate programs.
- Students will design and test simple digital circuits by using friendly graphical user interfaces and diagrams.

- Students will have the opportunity to compare simulation results in two different digital circuit design software environments.
- In the next following laboratory experiments, students will have to build a prototype circuit and compare the circuit operation to computer simulation results.

Instructional Activities

The lecturer will review and present materials using interactive whiteboard examples to the whole class. Lecturer to provide instructions and tutorials on how to using the logic circuit software tools and the web links to the resources provided to students. (50 minutes)
Students are given time to complete the lab exercise activities. (130 minutes)

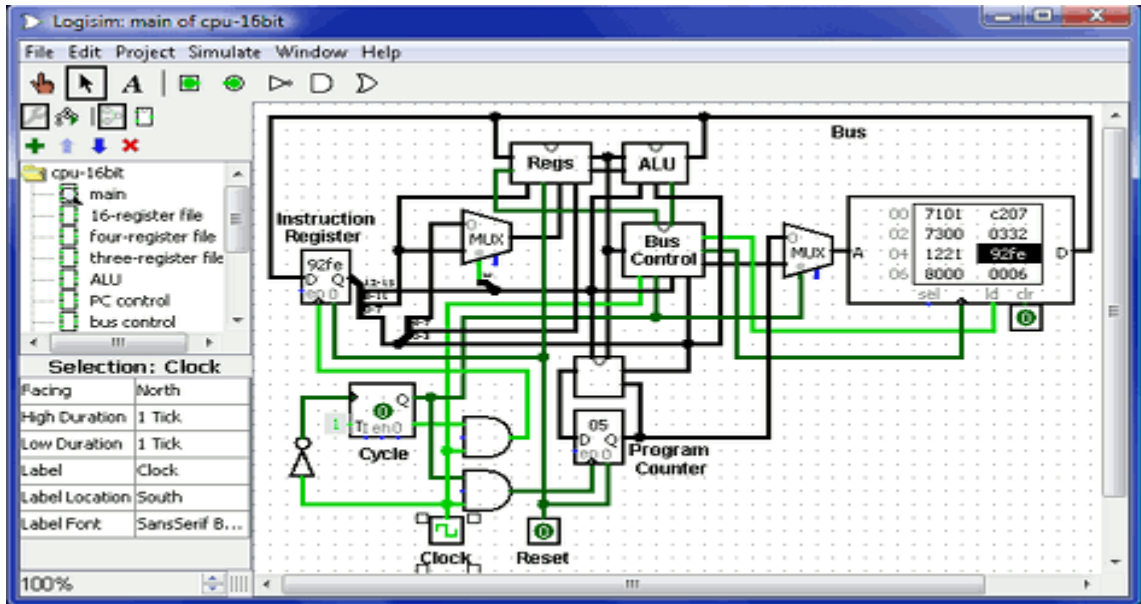
Learner Assessment

Student completion of the simulation of the digital logic circuit.

Logic Circuit Design and Verification

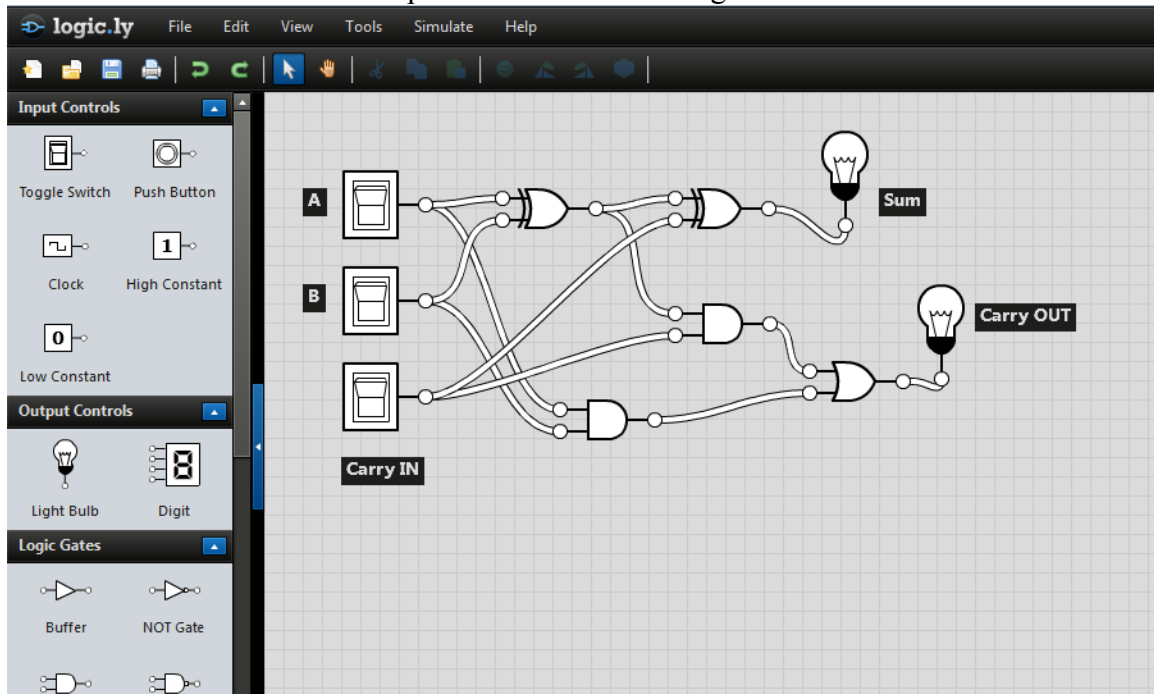
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Screen shot of Logisim 2.7.0

<http://www.cburch.com/logisim/>



<https://logic.ly/demo/>