Project 1

Submission and Grading criteria

Project Description

Design a small calculator which operates on two 4-bit unsigned numbers. The first operand (x) is entered by using the upper four switches (7 through 4), and the second operand (y) is entered by using the lower four switches (3 through 0). The operation is performed when one of the momentary buttons is pressed. Button 0 corresponds to addition, button 1 corresponds to subtraction (x-y), and button 2 corresponds to reverse subtraction (y-x). Button 3 is unused. The inputs (x and y) are latched when a momentary button is pressed. Until the momentary button is pressed, changes in the inputs x and y are ignored. If the result of the operation is negative the seven-segment display should display a negative sign preceding the result of the operation. The LEDs should illuminate which switches are on (logic 1) and which are off (logic 0). If a switch is on, the LED next to the switch should be on, and if it is off, the LED next to the switch should be off. The LEDs and the seven-segment display should update only when one of the momentary push buttons is pressed. Note that whenever button 3 is pressed, it should be ignored (nothing should be updated).

Project 1 Deadline

- **3/11/11, 11:59 PM**
- Late submissions will result in a 20 % penalty per day. A day is defined as 24 hours after the day/time the assignment is due (excluding weekends or school holidays).
- No help will be available from the TAs or from the instructor for a project after its scheduled due date.
- After five (5) days, the assignment will no longer be accepted.

What to Submit

- Submit two compressed folders (.ZIP)
  - First Folder with name "files" (after compression the name should be "**files.zip**") which include:
    - YourProjectName.bit
    - YourProjectName.mcs
    - YourProjectfiles.v (any .v files)
    - Documentation files.
    - Extra credit Documentation file under name extracridet.doc or .pdf explaining how the extra requirement is working.
  - Note: Simulation is optional and its up to you if you want to include simulation files but they will not affect your grade.

– Second Folder with name **Project** (after compression name should be "**Project.zip**") which include all project files (Make sure it includes all the files)

How to submit

- Your design should be submitted online using the command *submit_cse490 filename(s)* or *submit_cse590 filename(s)* where *filename(s)* are the name(s) of your file(s) on   the CSE Linux/Unix timeshare machines (*pollux.cse.buffalo.edu* or *timberlake.cse.buffalo.edu*)
  - Again we expecting two compressed files (**files.zip** and **project.zip**, refer to the previous slides for more information)
- Note: if *pollux is not working try timberlake, if not send the files email to:*
  - jangyoun@buffalo.edu
  - and cc stevko@buffalo.edu

Grading criteria

- **Project documentation**: you should include a list of project objectives. Document which objectives you successfully implemented. For those that were not obtained, indicate why.
  - Make sure that your documentation is well written and organized.
- **Project Main functionalities** as found in the project description, we will print your .bit and .mcs files on our board and try all the options, any missing functionality and its not justified in the documentation we will ducted some points accordingly.
  - it will be the grader evaluation for any justified unimplemented functionality to deduct.

Grading criteria

- **Your code**:
  - How well organized
  - How well implemented.
  - How well commented.

Grades

- **Functionality** 6 points.
- 2 points for **documentation**.
- 2 points for **code quality**.
- 1 point **Extra credit**

- Total 11/10

Output format

- The project output Could be in Decimal or Hexadecimal.

- In your documentation you should indicate what is the output format.

- To have **extra credit** you may implement an option to switch between decimal and hexadecimal, include this method in your extracridet.doc file.