

**Homework#3****Due to: December 7, Wednesday 23:59**

In this third homework, you are asked to implement the following system in Logisim.

The system has:

1. Two 7-segment displays at addresses 0xB00 and 0xB01. Use the 7-segment displays of Logisim which can display 4-bit hexadecimal numbers directly. **You can use Hex Digit Display in Logisim.**
2. A keypad with data register 0x900 and status register at 0x901. Your software must poll this keypad regularly. When a number is entered, your software must sum all numbers from 1 to the entered number and display the result at the display at 0xB00
3. Another keypad connected to IRQ 3, whose data register is at 0xA00. When your software receives an interrupt from this keypad, it must read the data and display the result at 0xB00.
4. There must be a single led in the circuit. If the data at the display 0xB00 came from keypad 0xA00, it must be on. If the data came from keypad 0x900, it must be off.
5. A clock, ie an 16-bit counter, which increments by one at every clock cycle. It is connected to IRQ 6 and it is seen at the memory location 0xd23. At every 1024th clock, it sends an interrupt to CPU. The CPU reads the counter and displays the result at 0xB01.

**Submission Instructions**

Please zip and submit all your files by using filename GroupName\_pro1.zip to: [cse417.mufe@gmail.com](mailto:cse417.mufe@gmail.com). In the subject line of the email, please write your project number and group member(s). Do not leave the subject line empty. Group name should consist of the first letter of your name and your surname like bkiraz\_pro1.zip (bkiraz\_akiraz\_pro1.circ for two-person group). No late submission will be accepted.

- Logisim files
- The source code that transforms a program written in assembly language into the computer's machine code. This program will accept a file which contains a program written in assembly language as its inputs and outputs another file which contains the corresponding computer's machine code.
- A report that contains a detailed discussion on your design.
- Sample program written in assembly language and the corresponding machine code.

**Demos:** Demos for project#2 will be held on Dec 8 and 9. Please write your name to the list on TA's office door. Please bring your laptop for demo.