CS120B – Homework #2

Summer 2 2003. Professor Hwang

Given August 13, 2003. Due August 18, 2003 at the beginning of class.

No late homework accepted.

Your work must be completely typeset with a word processor. Circuit diagrams can be drawn using any drawing program or by hand but it must be very neat. Handwritten works will **NOT** be accepted. (13 points total)

1. Draw a datapath, using the fewest functional units, that can execute the following algorithm. There should be only one data input port and one data output port.

```
Input A
C = 0
For B = 1 to 10 do
   C = A + B
   If C is odd then
      Output B
   Else
      A = A + 1
Output C
```
(3)

2. How many control signals is needed by your datapath for question 1? (1)

3. Draw the state diagram for a Moore FSM for the algorithm in question 1. (3)

4. Derive the control unit for the state diagram in question 3, using D flip-flops. (3)

5. Connect two 2K RAM chips to the 8051 such that the lowest location on one chip starts at memory address 0 hex and the lowest location on the second chip starts at 4K hex. (3)