EGRE 426
Lab 6

This lab may be done in **groups of two**. The **lab must be completed and demonstrated by November 2nd**. A single combined lab report is acceptable provided both members of the group make equal contributions to completing the lab. **The lab report will be due at the beginning of class on November 3rd**. You and your partner must demonstrate your significant progress to Dr. Tucker or the TA by next Wednesday. By significant progress I mean that most portions must be working. Credit will be given only to those present for the demonstration. You and your partner must turn in a single joint lab report. In the lab report thoroughly discuss any changes you make to the provided code. You must demonstrate that your code can run a program (in the file m_in.txt) that sums the number 1 through 10 and places the result in a memory location. The test bench must then dump memory to the file m_out.txt showing the correct sum in memory.

Use the provided programs as a starting point for implementing a non-pipelined version of the MIPS processors. Do this based on the non-pipelined Kips processor we developed in class. Without changing the entities, you are required to correct and clean up the code that I provided. This may include corrections to the test program in m_in.txt. Remove any unnecessary signals, variables, and associated code. You are also expected to provide comments to help understand the function of the code. Turn in a complete listing as part of your lab report.

For now you are only required to implement the instructions shown below. Later you may be required to implement other instructions, and to run other test programs. **Watch the class web page for possible updates.**

lw	rt,ofst(rs)		rt $\leftarrow$ M(rs + $\pm$ofst)		
100011	rs	rt	Ofst		

sw	rt,ofst(rs)		M(rs + $\pm$ofst) $\leftarrow$ rt		
101011	rs	rt	Ofst		

			if rs=rt then PC$\leftarrow$PC +$\pm$ofst$|$00		
beq	rs,rt,ofst		else PC $\leftarrow$ PC+4		
000100	rs	rt	Ofst		

add	rd,rs,rt		rd $\leftarrow$ rs + rt		
000000	rs	rt	rd	00000	000000

j	addr		PC $\leftarrow$ PC(31..28)$\|$addr$|$00		
100000	Addr				

addi	rd, rs, n		rd $\leftarrow$ rs + $\pm$n		
100000	rs	rt	Ofst		

The following files are used for this lab.
1. m_in.txt – A test program.
2. tb_npkips.vhd – The test bench.
3. npkips.vhd – Implements the processor.
4. npkips_cu.vhd – The control unit which you developed in the previous lab.
5. pkg_npkips.vhd – A package containing useful definitions.