**Homework 6 Stage 2**

Instruction[pc]=[opcode,reg,reg,reg,imm]

DataMemory[addr]=[read data, write data]

Signals C-R-Sw-Disp[clock,reset,switch0,display]

\* Recall data memory addr = ALU output

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw-Dsp[0,1,1,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[1,1,1,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 2]=[ 0, 2] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 2]=[ 0, 2] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 10]=[ 0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 10]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 1]=[ 0, 1] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 1]=[ 0, 1] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 15]=[ 0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 15]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 2]=[ 0, 2] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 2]=[ 0, 2] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 10]=[ 0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 10]=[ 0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 1]=[ 0, 1] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 1]=[ 0, 1] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 15]=[ 0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 15]=[ 0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 2]=[ 0, 2] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 2]=[ 0, 2] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 10]=[ 0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 10]=[ 0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 1]=[ 0, 1] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 1]=[ 0, 1] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 15]=[ 0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 15]=[ 0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ 3]=[ 0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 3]=[ 0, 3] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ 5]=[ 0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[ 0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[ 0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

**Homework 6 Stage 3**

Instruction[pc]=[opcode,reg,reg,reg,funct]

DataMemory[addr]=[read data, write data]

Signals C-R-Sw-Disp[clock,reset,switch0,display]

\* Recall data memory addr = ALU output

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,1,1,xxxxxxx]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,1,1,xxxxxxx]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[1,0,0,1111110]

**Lab 5 Subproject 1**

**Note 1: the testbench from homework 6 stage 2 is changed so that after the “io\_sw0=0”, we change the time to be “#200”, since each instruction needs 4 cycles. Also please notice that the “io\_sw0” and “io\_sw1” do not matter in this case because we do not write anything to the data memory.**

**Note 2: the critical outputs are marked as bold. If you compare these outputs with the homework 6 stage 2 outputs, you can find that they are the same.**

Instruction[pc]=[opcode,reg,reg,reg,imm]

DataMemory[addr]=[read data, write data]

Signals C-R-Sw-Disp[clock,reset,switch0,display]

\* Recall data memory addr = ALU output

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[x, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[x, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[x, x] C-R-Sw-Dsp[0,1,1,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ x]=[x, x] C-R-Sw-Dsp[1,1,1,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ x]=[x, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

**Instr[ 2]=[000,111,000,011,1100] DataMem[ 3]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]**

**Instr[ 2]=[000,111,000,011,1100] DataMem[ 3]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]**

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

**Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]**

**Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]**

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 3]=[0, 3] C-R-Sw-Dsp[1,0,1,xxxxxxx]**

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 3]=[0, 3] C-R-Sw-Dsp[0,0,1,xxxxxxx]**

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

**Instr[ 8]=[110,111,111,101,0010] DataMem[ 5]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]**

**Instr[ 8]=[110,111,111,101,0010] DataMem[ 5]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]**

Instr[ 8]=[110,111,111,101,0010] DataMem[ 3]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 3]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 3]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 3]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 3]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 3]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

**Instr[ 10]=[101,111,110,100,0111] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]**

**Instr[ 10]=[101,111,110,100,0111] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]**

Instr[ 10]=[101,111,110,100,0111] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]

**Instr[ 12]=[000,000,000,000,0000] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,1,xxxxxxx]**

**Instr[ 12]=[000,000,000,000,0000] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,1,xxxxxxx]**

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 2]=[0, 2] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 2]=[0, 2] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 8]=[110,111,111,101,0010] DataMem[ 10]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 8]=[110,111,111,101,0010] DataMem[ 10]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 2]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 10]=[101,111,110,100,0111] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 10]=[101,111,110,100,0111] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 10]=[101,111,110,100,0111] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 12]=[000,000,000,000,0000] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 12]=[000,000,000,000,0000] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 1]=[0, 1] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 1]=[0, 1] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 8]=[110,111,111,101,0010] DataMem[ 15]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 8]=[110,111,111,101,0010] DataMem[ 15]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 8]=[110,111,111,101,0010] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ 1]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 10]=[101,111,110,100,0111] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 10]=[101,111,110,100,0111] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 10]=[101,111,110,100,0111] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 12]=[000,000,000,000,0000] DataMem[ x]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 12]=[000,000,000,000,0000] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 12]=[000,000,000,000,0000] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 6]=[110,000,010,110,0100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 6]=[110,000,010,110,0100] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 0]=[110,000,001,111,1010] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 0]=[110,000,001,111,1010] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ x]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Instr[ 2]=[000,111,000,011,1100] DataMem[ 3]=[0, x] C-R-Sw-Dsp[1,0,0,xxxxxxx]**

**Instr[ 2]=[000,111,000,011,1100] DataMem[ 3]=[0, x] C-R-Sw-Dsp[0,0,0,xxxxxxx]**

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 2]=[000,111,000,011,1100] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[1,0,0,xxxxxxx]

Instr[ 4]=[101,111,111,000,0010] DataMem[ 0]=[0, 0] C-R-Sw-Dsp[0,0,0,xxxxxxx]

**Lab 5 Subproject 2**

**Note: the testbench from homework 6 stage 3 is changed so that after the second “reset=0”, we change the two “#50” to “#200”, since each instruction needs 4 cycles.**

Instruction[pc]=[opcode,reg,reg,reg,funct]

DataMemory[addr]=[read data, write data]

Signals C-R-Sw-Disp[clock,reset,switch0,display]

\* Recall data memory addr = ALU output

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ x]=[xxx,xxx,xxx,xxx,xxxx] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,1,1,xxxxxxx]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,1,1,xxxxxxx]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 8]=[110,011,000,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 10]=[101,000,001,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 12]=[110,111,111,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 12]=[110,111,111,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 14]=[100,000,101,001,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 14]=[100,000,101,001,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[1,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[0,0,1,xxxxxxx]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 1, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 1]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 1]=[ 0, 1] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ 48]=[ 0,65520] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 10]=[101,000,001,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0, 48] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,1,0110000]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 14]=[100,000,101,001,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[1,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[0,0,0,0110000]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[65530]=[ 0,65534] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 16]=[101,111,100,000,0111] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ x]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 18]=[000,000,000,000,0000] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 0]=[110,111,000,011,1011] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[65520]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 2]=[011,000,000,001,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[65520]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 4]=[111,000,000,110,1101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ 0]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 6]=[101,000,001,100,0101] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 8]=[110,011,000,011,1100] DataMem[ 0]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 12]=[110,111,111,011,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65520]=[ 0,65520] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[1,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[65534]=[ 0, 0] C-R-Sw0-Dsp[0,0,0,1111110]

Instr[ 14]=[100,000,101,001,1100] DataMem[ x]=[ 0, x] C-R-Sw0-Dsp[1,0,0,1111110]