Lab 1

Part B

Do the following conversions of MIPS instructions and their machine codes. Show your work (steps 1-5) as in the tutorial video:

a. addi $s1, $s2, 0xff11

Step 1	I-type
Step 2	Addi – opcode Rt=$s1 Rs=$s2 Imm
Step 3	Addi – opcode – 001000
Step 4	Rt=$s1 = 17 = 10001 Rs=$s2 = 18 = 10010 Imm = 0xff11
Step 5	001000 10010 10001 1111 1111 0001 0001 0010 0010 0101 0001 1111 1111 0001 0001 **0x2251ff11**

b. lb $s2,4($s1)

Step 1	I-type
Step 2	lb – opcode Rt=$s2 Rs=$s1 Imm = 4=0000 0000 0000 0100
Step 3	lb – opcode – 100000
Step 4	Rt=$s2 = 18 = 10010 Rs=$s1 = 17 = 10001 Imm = 4=0000 0000 0000 0100
Step 5	10000010001100100000 0000 0000 0100 1000 0010 0011 0010 0000 0000 0000 0100 **0x82320004**

c. 0x012a602a

Step 1	0000 0001 0010 1010 0110 0000 0010 1010 R-type
Step 2	000000 01001 01010 01100 00000 101010 Opcode=000000 Rs=01001 Rt= 01010 Rd = 01100 sa= 00000 fn = 101010
Step 3	fn = 101010 =slt
Step 4	Rs=01001 = 9 = $t1 Rt= 01010 = 10 = $t2

	Rd = 01100 = 12 = $t4 sa= 00000
Step 5	**slt $t4,$t1,$t2**

d. 0x36730098

Step 1	0011 0110 0111 0011 0000 0000 1001 1000 I-type or J-type
Step 2	001101 10011 10011 0000 0000 1001 1000 Opcode=001101 Rs=10011 Rt= 10011 Imm = 0000 0000 1001 1000 =0x0098
Step 3	Opcode=001101 = ori
Step 4	Rs=10011 = 19 = $s3 Rt= 10011 = 19 = $s3 Imm = 0000 0000 1001 1000 =0x0098
Step 5	**ori $s3,$s3,0x0098**