MIPS 4 Bit Processor Design

List of instructions:

Total 12 instructions

Instruction ID	Instruction Type	Instruction Name
A	Arithmetic	add
B	Arithmetic	sub
C	Arithmetic	addi
D	Arithmetic	subi
E	Logic	and
F	Logic	andi
G	Logic	or
H	Logic	ori
I	Memory	lw
J	Memory	sw
K	Control	beq
L	Control	j

Memory Considerations:

You need to consider three types of memory:

- Instruction Memory (accessed through program counter, pc)
- Data Memory (accessed through address)
- Stack Memory (accessed through stack pointer, sp
  Sample instruction: sw $t0, 0($sp) or lw $t1, 4($sp))

Group Size: 3

Group Formation: Divide your groups for ALU into 2. So, for each section, there will be 10 groups. Group 1 of each section for ALU will form Group 1 and 2, Group 2 of each section for ALU will form Group 3 and 4, and so on. Among the two groups, the group with lower student id will get the lower group no.

Instruction and Opcodes:

The opcodes of the instruction will be between 1 to 12 based on the sequence of instruction id given below. Sequence ABCDEFGHIJKL means add instruction's opcode will be 1, sub instruction's opcode will be 2, addi instruction's opcode will be 3, and so on.

Group	Section A1	Section A2	Section B1	Section B2
1	ABCDJKEIGFLH	ABCDHIGFELJK	ABCDJFEGKIHL	ABCDKGFHEJLI
2	BCDEKAHJFLIG	BCDEIALKGFHJ	BCDEJAIHFKGL	BCDEJKALHGIF
3	CDEFLBJHAIKG	CDEFKHIBJGLA	CDEFGHJALBKI	CDEFJGLBAHKI
4	DEFGACBKJILH	DEFGIJALCBHK	DEFGIHAKJBCL	DEFGHIJBAKLC
5	EFGHBDJICAKL	EFGHBDCAJKIL	EFGHCLKBDJIA	EFGHKDCLIBJA
6	FGHIDKBALJEC	FGHIJCADEKLB	FGHIJDKABLCE	FGHIJKDALBCE
7	GHIJELDKAFBC	GHIJKDEBFCAL	GHIJACBEFKDL	GHIJDAFCLEKB
8	HIJKFAGCLDBE	HIJKCBLDEFAG	HIJKAFDGBCEL	HIJKDFCABGLE
9	IJKLGCBFEHAD	IJKLBEFCHDAG	IJKLCHAGBEDF	IJKLGDFABEHC
10	JKLAHDFCIBGE	JKLAEBHGDCFI	JKLABIHCFDGE	JKLABHFCGDEI