ALU definition:

Inputs :
Control Line**:** By giving each instruction control line signals, ALU

finds the appropriate instruction from machine code. ***Reg_1 :*** First register given to ALU
Reg_2: Second register given to ALU

Output:

Returns 32-bits which is calculated by the given instruction

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Functions:

flip(c): *Converts zeroes to ones and vice versa .*
OneAndTwoesComplement(bin): Calculates 2's complement and

returns it.

ALU(controlLine , reg_1 , reg_2) : It depends on control line signals as follows:

"0000" : Used for *'AND'* operations -> R-Type

"0001": Used for *'OR'* operations -> R-Type

"0010": Used for *'ADD'* operations -> LW , SW , R-Type

"0110": Used for *'SUB'* operations -> Branch Equal , R-Type

"0111": Used for *'SLT'* operations -> R-Type - Signed

"1000": Used for *'SLTU'* operations -> R-Type - Unsigned

"1100": Used for *'NOR'* operations -> R-Type

"1101": Used for *'SLL'* operations -> shifts Reg_1 to left with shift amount of reg_2

"1110": ": Used for *'SRL'* operations -> shifts Reg_1 to right with shift amount of reg_2