

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

Functions:

flip(c): Converts zeroes to ones and vice versa .

OneAndTwosComplement(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

"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

