EGC-442 HW #3 Dr. Izadi

First Name: _____ Last Name: _____

Problem 1 (25 Points)
Show the internal architecture of a 4-bit ALU with the following function table:

ALU Control Lines	Functions
	AND
	OR
	XOR
	NAND
	NOR
	ADD
	Subtract
	SLT

Your design should have the following flags:
Carry, Sign, Zero, Overflow

Problem 2 (15 Points)
Write a MIPS subroutine to carryout the following function.

```
temp = v[k];
v[k] = v[k + 1];
v[k + 1] = temp;
```

Assume base address of v is register $a1, k is in register $a2, and temp is assigned to $s1.

Problem 3 (15 Points)
Show the IEEE 754 binary representation of the number $+0.375_{ten}$ in single precision

Problem 2 (15 Points)
Show the IEEE 754 binary representation of the number -0.9375_{ten} in double precision:

Problem 3 (20 Points)
Convert the single precision binary floating-point representation to decimal.

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1 bit 8 bit 23 bit

Figure 1: Floating point representation

Due 3/3/2023