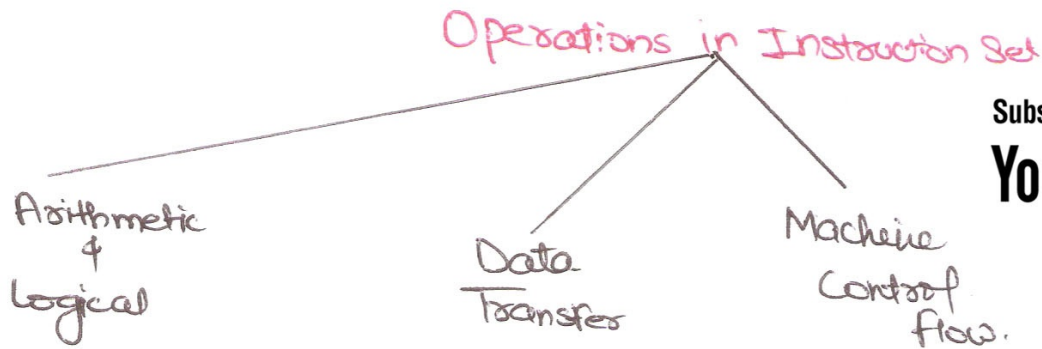


Operations in the Instruction Set.

OR

Types of Instructions in ISA

Computer instructions are the translation of high level language code to machine level language programs.



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Operations :- Arithmetic & Logical



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Arithmetic :- This basically have four operation which are ADD, SUB, MUL and DIV.

An arithmetic instruction may operate on fixed-point data, binary or decimal data etc.

The other possible operations include a variety of Single-Operand instructions, for example ABSOLUTE, NEGATE, INCREMENT, DECREMENT.

The execution of arithmetic instructions requires bringing in the operands in the operational registers so that the

data can be processed by ALU. Such functionality is implemented generally within instruction execution steps.

• For Addition use normal binary addition

$$- 0 + 0 = \text{Sum } 0 \text{ Carry } 0$$

$$- 0 + 1 = \text{Sum } 1 \text{ Carry } 0$$

$$- 1 + 1 = \text{Sum } 0 \text{ Carry } 1$$

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LOGICAL :- AND, OR, NOT, XOR operate on binary data stored in Registers.

For example, if two registers contain the data

$$R_1 = 1011\ 0111$$

$$R_2 = 1111\ 0000$$



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Then $R_1 \text{ and } R_2 = 1011\ 0000$. Thus the AND operation can be used as a mask that selects certain bits in a word and zeros out the remaining bits. With one register is set to all 1's, the XOR operation inverts those bits in R1 register where R2 contains 1.

$$\underline{R_1 \text{ XOR } R_2 = 0100\ 0111}$$