

Computer Instruction Types and Formats: As we have learnt that computer instruction has three basic parts- the MODE BIT, OPCODE and ADDRESS.

A computer uses different kinds of instructions for different kinds of tasks, a general set of three discrete types of instructions are used in a modern computer. These are:

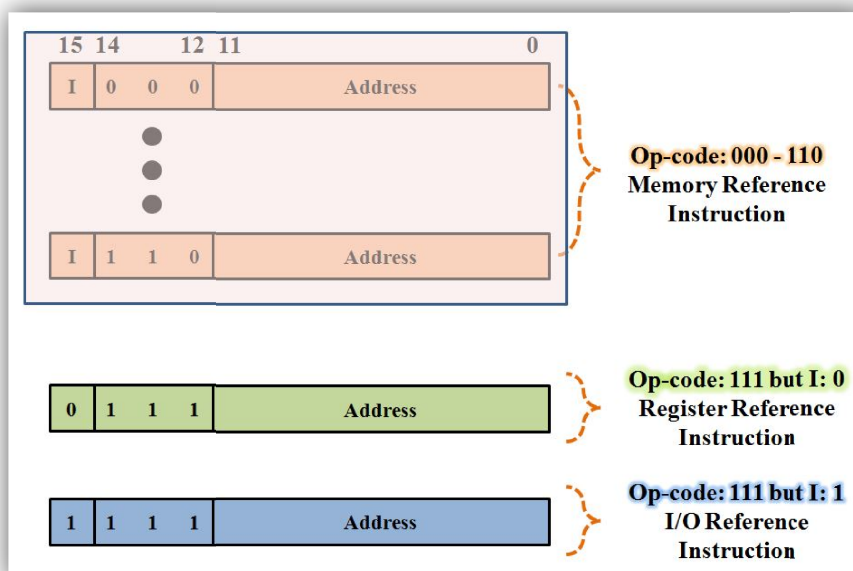
- Memory Reference Instructions
- Register Reference Instructions
- I/O Reference Instructions

Memory Reference Instructions: A Memory Reference Instruction is the one which refers to a significant memory location for its operands. For ex. ADD operation needs a memory operand to be added with the contents of AC.

Register Reference Instructions: Register reference instructions are even more frequent for CPUs rather than I/O reference instructions. This is in contrast that most of the CPU operations are performed within registers. Hence there are many situations when we need to transfer, complement, shift, increment or decrement the contents of registers. All these operations are performed using register reference instructions.

I/O Reference Instructions: I/O reference instructions are those that refer to some kind of input or output operation. An input operation denotes the transfer of input data from input device to AC whereas output operation denotes the transfer of output data from AC to output device.

To identify these instructions, we check the OPCODE part and the MODE BIT.



- The instruction having OP CODE from- 000 to 110 are called as MRI.
- The instructions having OP CODE- 111 but MODE BIT- 0 are called as RRI.
- The instructions having OP CODE- 111 but MODE BIT- 1 are called as I/ORI.

Assignment:

1. How many types of Instruction codes are there in CPU?
2. How can we identify MRI, RRI and I/ORI?