

1.2 REGISTERS

1. Purpose of Registers:

- Registers are temporary storage units inside the processor that hold operands (data elements) during operations.
- They allow the processor to access multiple operands at once, enhancing efficiency.

2. Types of Registers:

- General Registers: Used for holding data elements or operands during operations.
- Accumulator: A central register where mathematical and logical operations are performed. Its size determines the word size of the processor.
- Index or Pointer Registers: These registers do not hold data but store memory addresses of data, often used for loops and dynamic memory accesses.
- Flags Register (Program Status Word): A special register where individual bits carry different meanings, like the carry flag. It is used to handle conditions in operations.
- Program Counter (Instruction Pointer): This register holds the address of the next instruction to be executed, ensuring the correct order of instruction execution.

3. Role of Registers in Operations:

- Registers hold operands for operations like addition or subtraction, speeding up computation by reducing memory access.
- Some newer architectures feature general-purpose registers that can perform both data holding and address holding functions.

4. Program Execution:

- Instructions are stored as opcodes (numeric codes) in memory. The instruction pointer moves sequentially from one opcode to the next, ensuring correct execution.
- Mnemonics (symbolic representations like "add" or "sub") are used to make programming more

understandable, with assemblers translating them into opcodes for the processor.

5. Importance of Registers:

- Registers are critical to efficient processing as they store important information for operations and program execution.