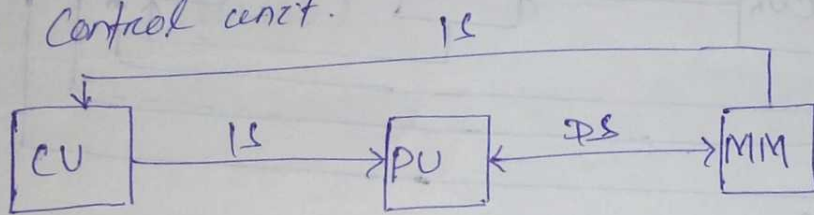


Flynn's classification: There are variety of ways that parallel processing can be classified. Parallel processing may occur in the instruction stream, in the data stream, or in both.

Flynn's classification divides computers into four major groups as follows

- (1) Single instruction stream - Single data stream (SISD)
- (2) Single instruction - multiple data stream (SIMD)
- (3) Multiple instruction stream - Single data stream (MISD)
- (4) Multiple instruction stream - Multiple data stream (MIMD)

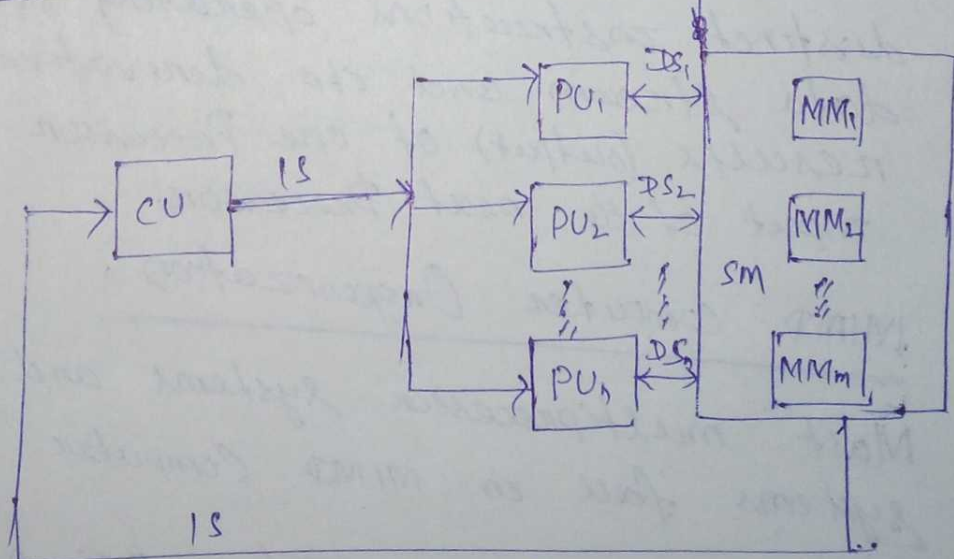
(1) SISD Computer Organization: Represents serial computers. Instructions are executed sequentially but may be overlapped in their execution stages (Pipelining). All the functional units are under the supervision of one control unit.



(SISD)

CU - Control unit  
 PU - Processing unit  
 MM - memory module  
 SM - Shared memory  
 IS - Instr<sup>n</sup> stream  
 DS - Data stream

(2) SIMD Computer Organization:

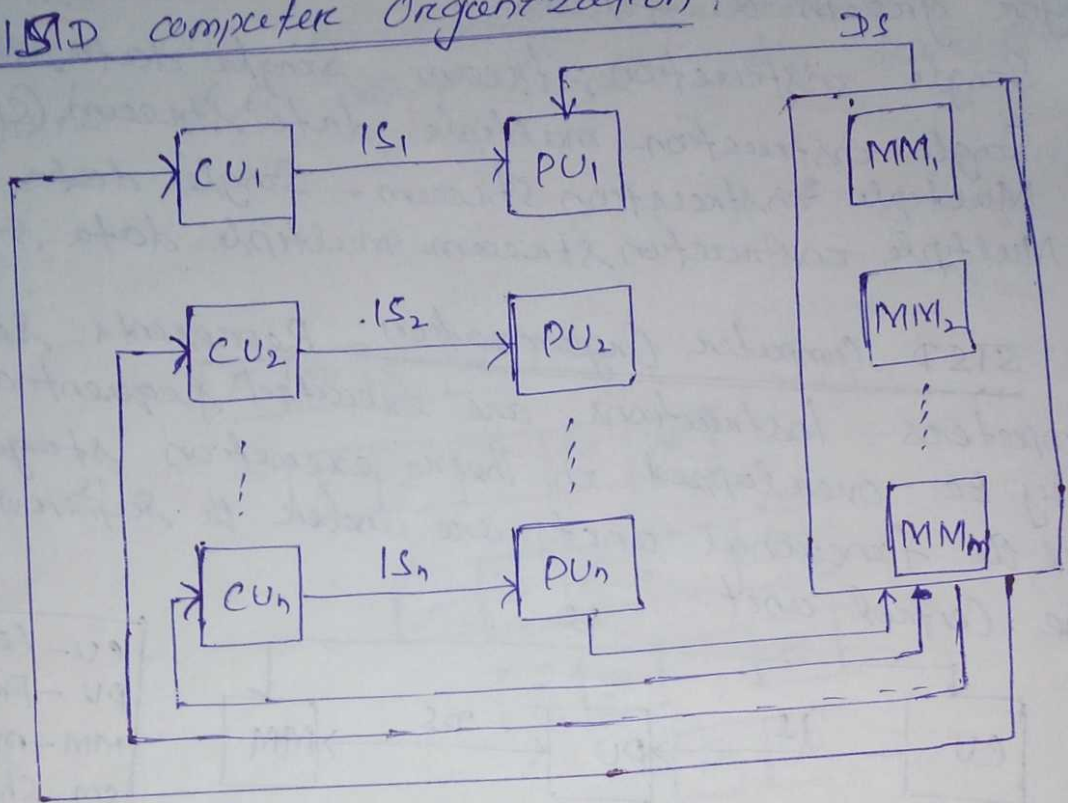


(SIMD Computer)

In this SIMD computer organization there are multiple processing elements supervised by the same control unit.

All PEs (Processing elements) receive the same instruction from the control unit but operate on different data sets from distinct data streams. The shared memory may contain multiple modules. This class corresponds to array processors.

### (3) MISD computer Organization:



(MISD)

This MISD Organization has no practical application. There are  $n$  processor units, each receiving distinct instructions operating over all the same data stream and its derivatives, i.e. the results (output) of one processor become the input of the next processor.

### MIMD computer Organization:

Most multiprocessor systems and multicomputer systems fall in MIMD Computer Organization.

There are  $n$  processing elements and each has its own control unit. Each control unit is given distinct instruction.

Stream and each processing element receives distinct data streams from the shared memory.

