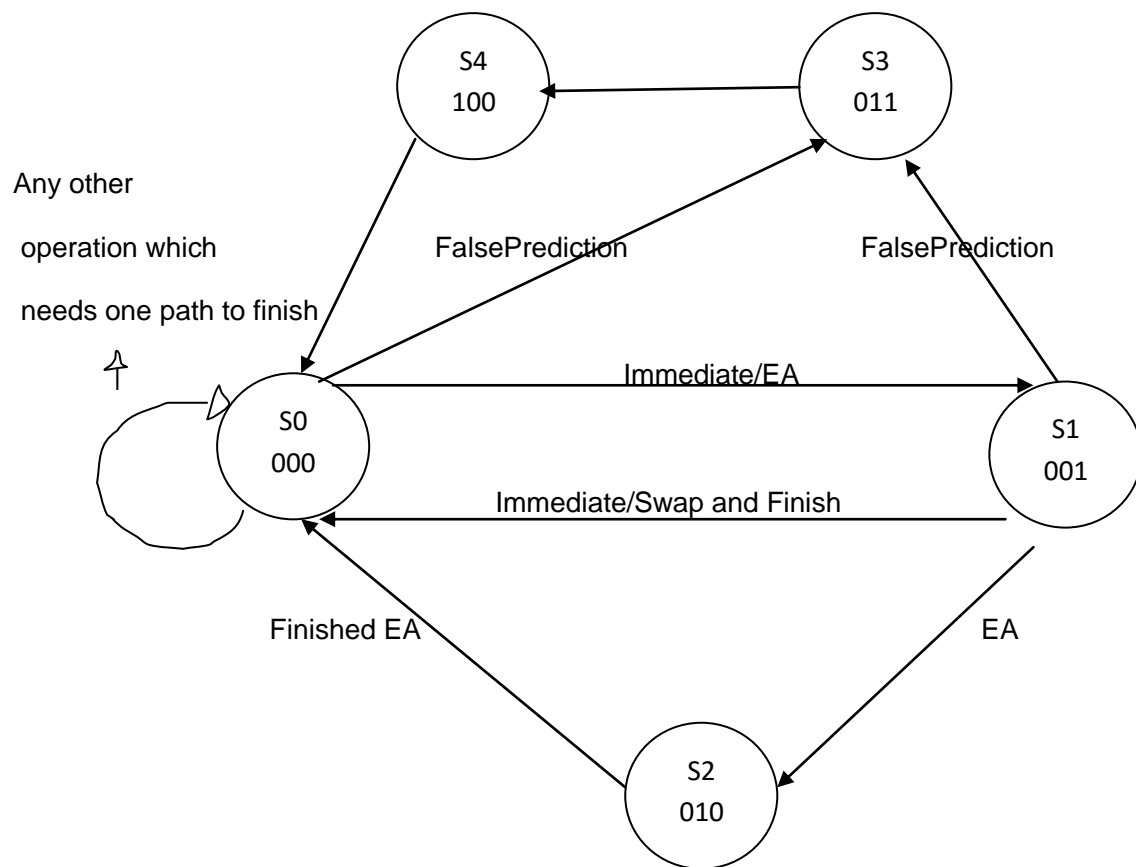


Control Unit states



This state machine is found at the **Control unit**. It's initially at (S0) state.

- 1- S0 state is the state that makes all the ordinary operations depends on the opcodes of the instruction as ADD, SUB,etc. so, the output of this state is All the Control signals that will help in executing this instruction.
- 2- If the opcode indicates that the operation makes an operation which needs an immediate value or EA, then go to the state (S1) which is used to output signals that will help in making the another fetch from the next slot in memory.
- 3- After finishing the operations, check if the operation is (Swap, Immediate operation) then after finishing executing the instruction, there's finished signal indicates that the operation is completed. So, return back to state (S0) again.
- 4- Else if the operation was EA, then we need another extra fetch for the 2 more bits So go to state (S2) which will do this fetch and stop decoding by sending its dedicated signals for that.

- 5- After finishing The EA instruction, the signal comes to make it return back to its (S0) initial state.
- 6- S3 and S4 are used only in case of a falsePrediction signal arrival, they neglect the input and flushes the current instruction. They are reached only from S0 or S1

P.S. Signals produced in each state, controlling the flow will be mentioned later