Notes

FSM => controller

ASM => controller + data path

data path: cannot exist without controller. Controller controls the flow of data in the data path. A collection of functional units, such as arithmetic logic units, multiplier, etc. that perform data processing operations.

Controller: (can be thought of as an FSM) H is the circuit that controls the flow of data through the processor, and coordinates the activities of the other units within the processor.

CPU: controller + data path. Control unit receives external instructions or commands. It converts the instructions into a sequence of control signals and applies them to the data path to implement a sequence of register transfer level operations.

FSM (Controller): {in, clk}-> next-state logic -> {.., clk} -> state reg -> output logic -> control output

Datapath: .. -> computing unit -> routing unit -> {.., clk} -> data reg -> routing unit -> data output