

AQA Computer Science AS Level
3.4.2 Finite state machines (FSMs)
Concise Notes



Specification:

3.4.2.1 Finite state machines (FSMs) without output:

Be able to draw and interpret simple state transition diagrams and state transition tables for FSMs with no output.



Finite State Machines

- **Computational models** for machines that are **always in a fixed state**
- Have a **finite number of states**
- Can **only ever be in one state** at once
- State changes depending on the **current state** and the **input data**
- If input data is valid, the FSM will terminate in an **accepting state**
- State changes according to **transition rules**

State Transition Diagrams

- A **visual representation** of a finite state machine
- Consist of **states** (circles) joined by **transitions** (arrows)
- Always have a **start state**, indicated with a leading arrow
- Always have an **accepting state** shown as a **double circle**
- **Transition functions** represented by an **arrow** between states

State Transition Tables

- Transition functions can be notated using a **state transition table**
- The table has columns for **current state**, **input** and **next state**

