COMP1021
Introduction to Computer Science

State Diagrams

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Outcomes

- After completing this presentation, you are expected to be able to:

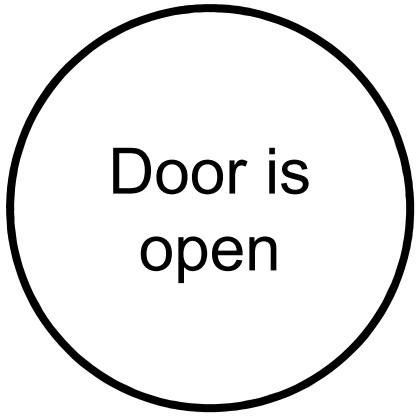
  1. Understand and explain a state diagram

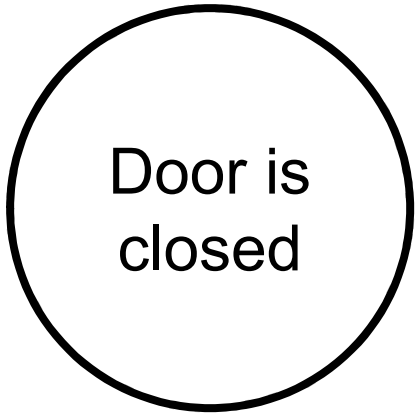
A State Diagram

- The basic idea of a state diagram is that it shows the various stages in a process and what needs to happen to move between those stages

States

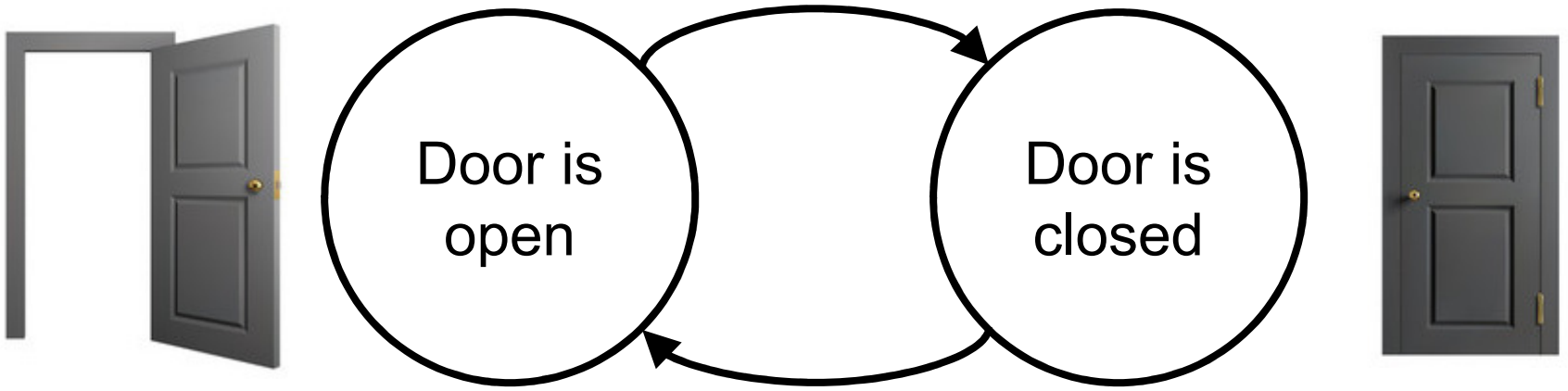
- States are commonly represented by circles or rectangles
- Here are examples showing the states of a door





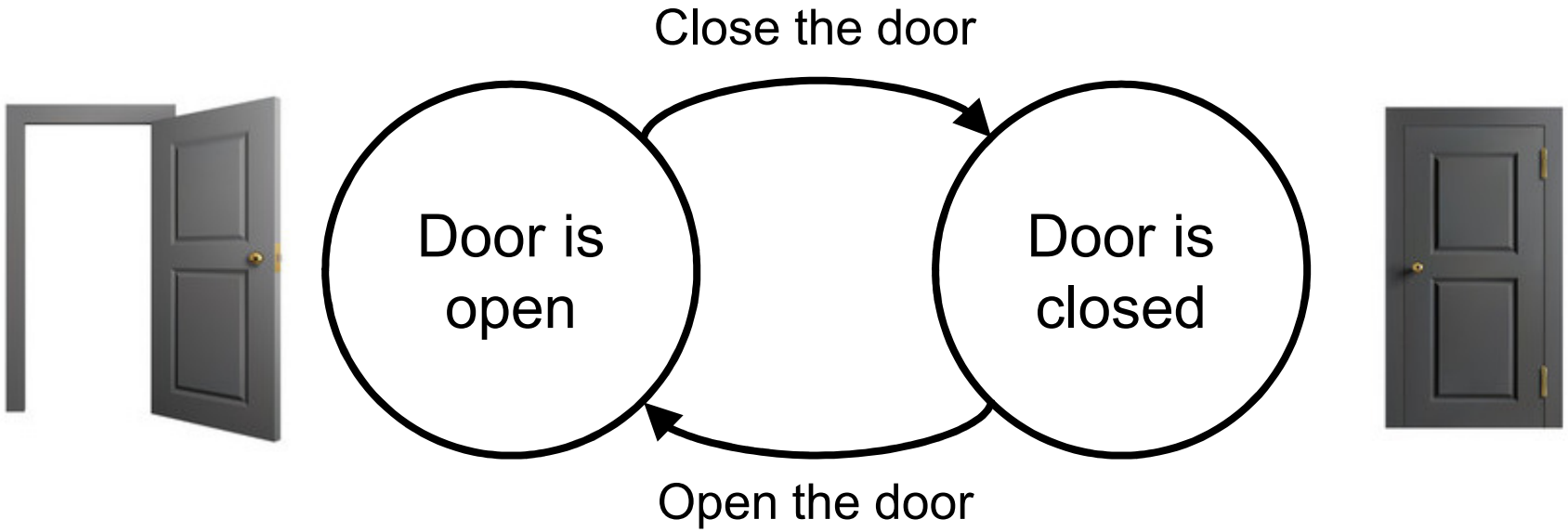
Transitions

- To show the process of moving from one state to another, an arrow links the states
- We call this a *transition*
- In our door example, the door changes between open and closed



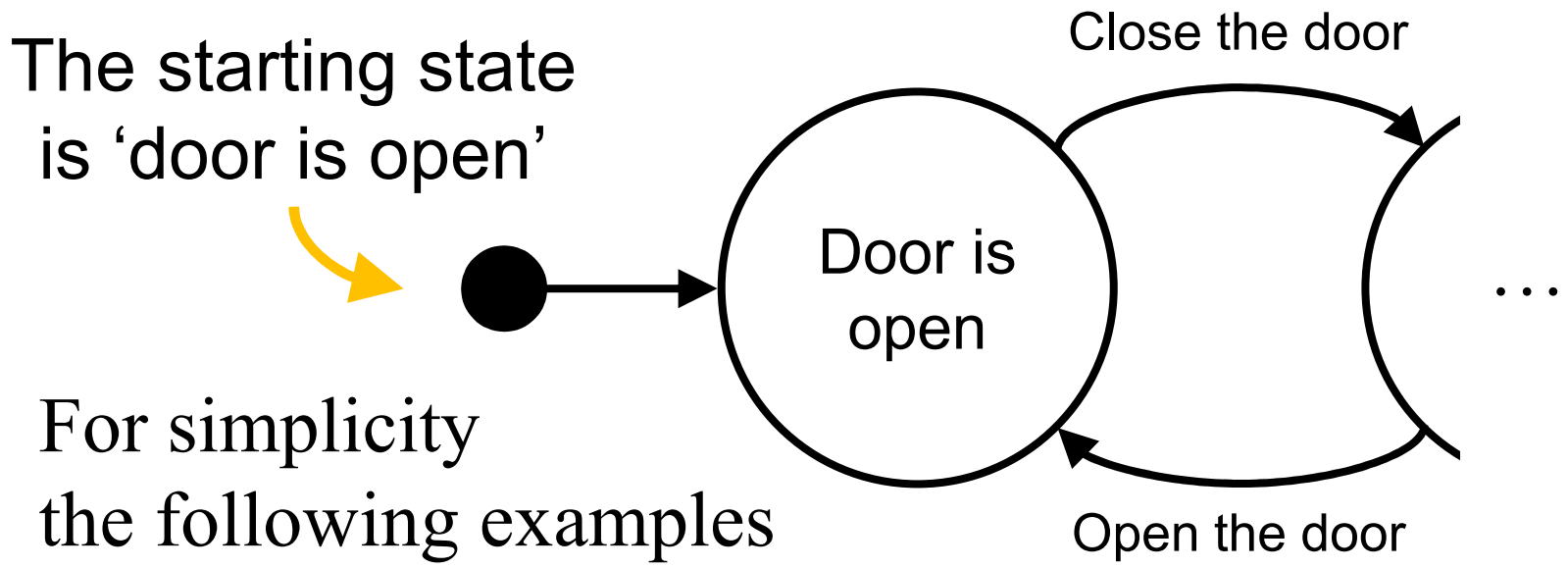
Transition Actions

- Sometimes, an action is associated with a transition
- It needs to occur in order to go from one state to another



The Starting State

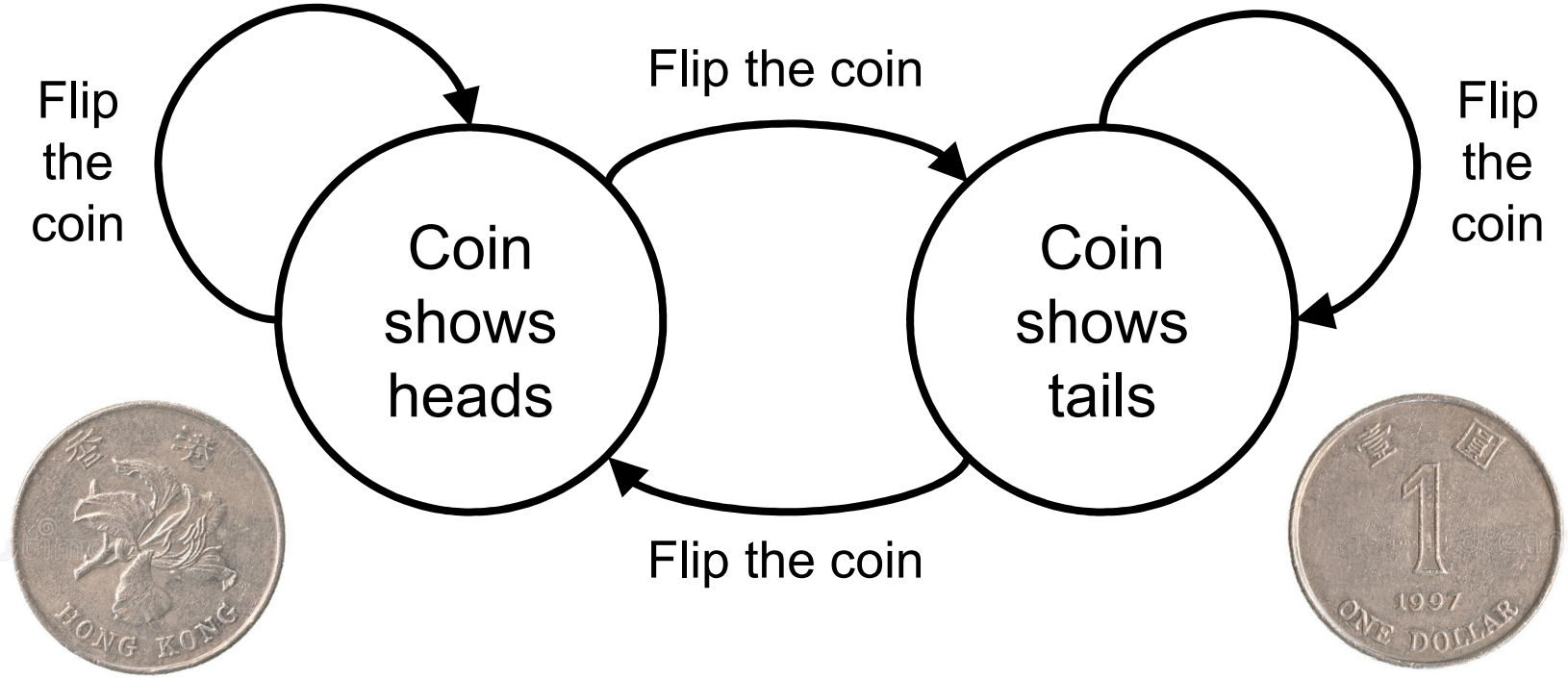
- You may want to indicate the starting state, i.e. the initial state the process is in
- Sometimes the initial state is shown by an incoming arrow with a black circle, like this:



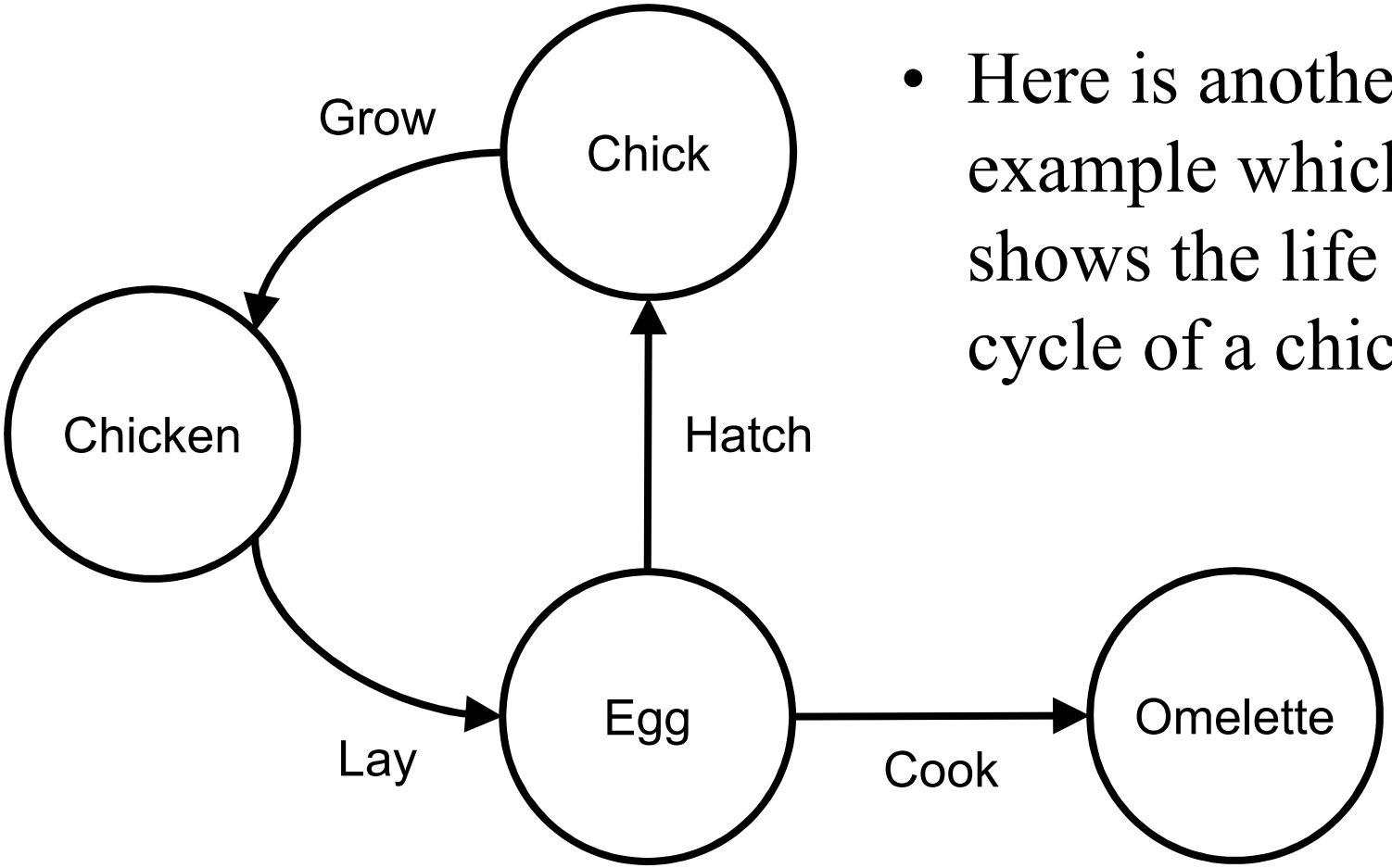
- For simplicity the following examples do not show the starting state

Flipping a Coin

- Here is another example in which a coin is continually flipped



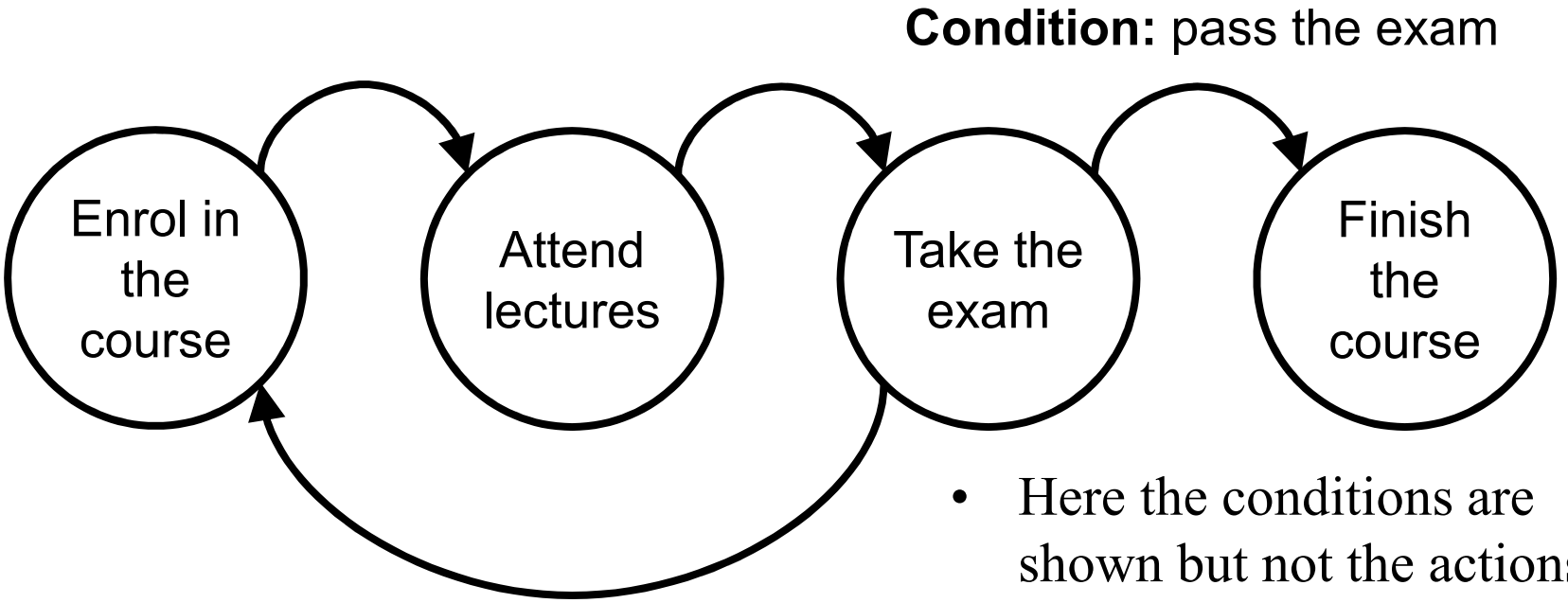
Life Cycle of a Chicken



- Here is another example which shows the life cycle of a chicken

Transition Conditions

- Transitions may have an associated condition
- A transition can only occur when the condition is satisfied



- Here the conditions are shown but not the actions, to make the diagram less crowded

Our Final Lab

- State diagrams can be used to visualize lots of different processes
- In our final lab we will use state diagrams to help us understand the stages necessary to help a robot get to the exit of a maze