Information System Design

IT60105

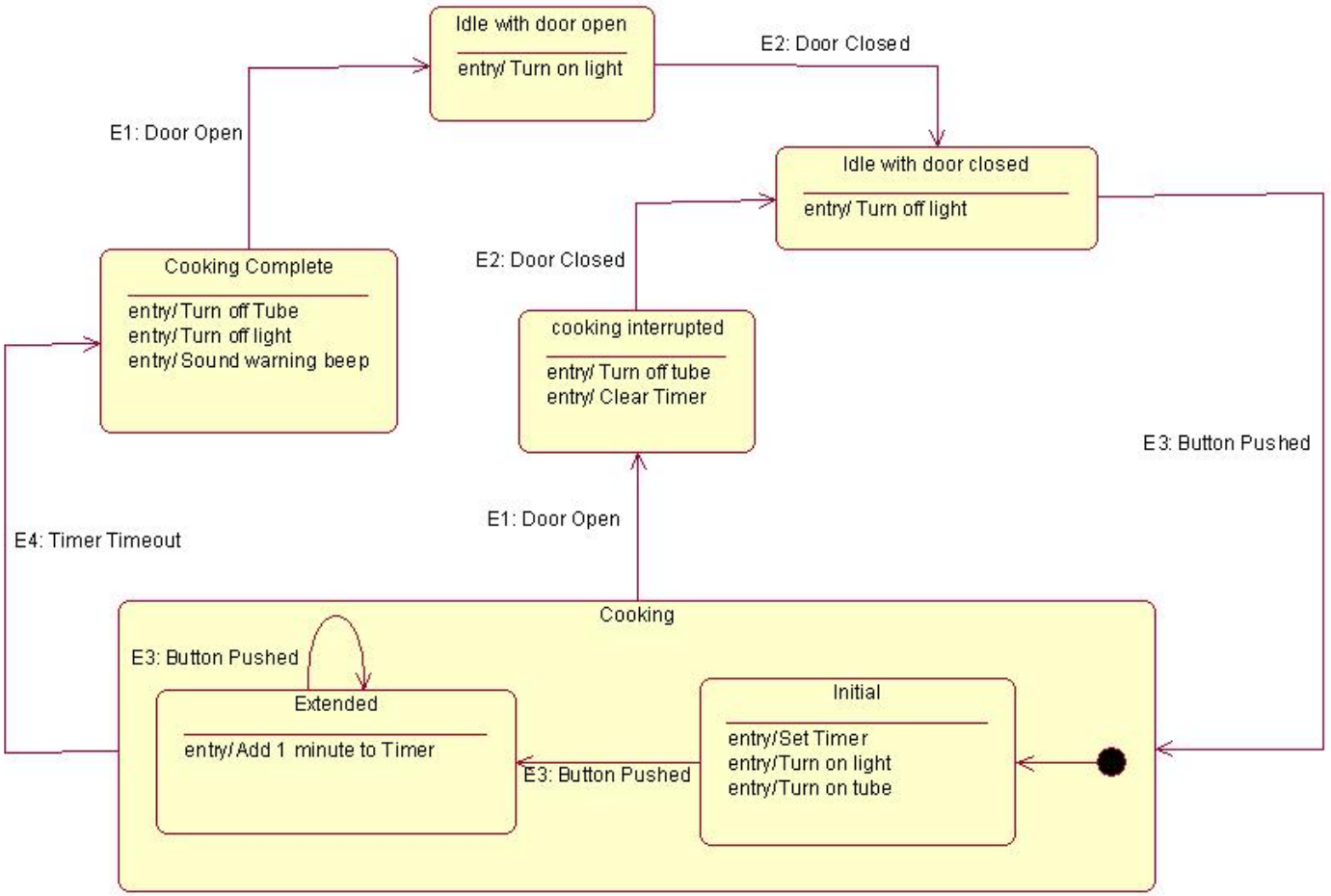
Lecture 14

Statechart Diagrams

Lecture #14

- How a statechart diagram can be converted to its code?

Example: Microwave Oven



Designing Class

State Machine	
Define states: S1, S2, …, Sn	// Protected
Define a state: currState	// Protected
All operations to define OnEntry actions	// Protected
Define the OnEntry operation	// Protected
Define all Events	// Public

State Attributes

- class Microwave {
  State : IdleWithDoorOpen, IdleWithDoorClose, Initial,
  CookingInterupted, Extend, CookingCompleted;
  State MyState;

  Class Tube p;
  Class Light l;
  Class Timer t;
  Class Beeper b;
  Class Door d;

Contd. on

Internal Actions

- class Microwave {
  State : IdleWithDoorOpen, IdleWithDoorClose, Initial,
  CookingInterupted, Extend, CookingCompleted;
  State MyState;

- void TurnOnLight();
- void TurnOffLight ();
- void TurnOffTube();
- void TurnOnTube();
- void ClearTimer();
- void SetTimer();
- void SoundWarningBeep();
- void Add1MinuteToTimer();
- void OnEntry();

Events Actions

- class Microwave {
  -
  -
  -

```
void DoorOpen();
void DoorClosed();
void ButtonPushed();
void TimerTimeout();
```

  }

Defining OnEntry()

```
1.  void Microwave :: OnEntry () {
2.          switch (MyState) {
3.          case IdleWithDoorOpen:
4.                  TurnOnLight();
5.                  break;
6.          case IdleWithDoorClose:
7.                  TurnOffLight();
8.                  break;
9.          case Initial:
10.                 SetTimer();
11.                 TurnOnLight();
12.                 TurnOnTube();
13.                 break;
14.     case Extended :
15.
                    Add1MinuteToTimer();
16.                 break;
17.     case CookingInterupted:
18.                 TurnOffTube();
19.                 ClearTimer();
20.                 break;
21.         case CookingCompleted:
22.                 TurnOffTube();
23.                 TurnOffLight();
24.                 SoundWarningBeep();
25.                 break;
26.         default :   // Should signal error here..
        }
```

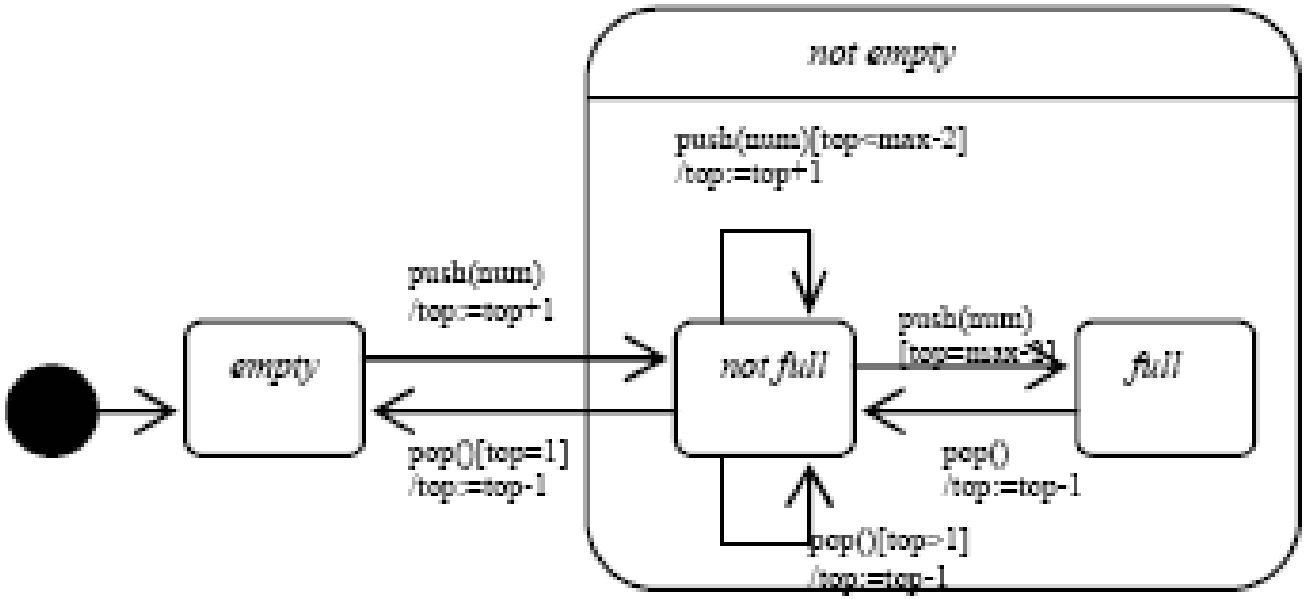
- Contd…

Defining DoorOpen()

```
void Microwave :: DoorOpen () {
        switch (MyState) {
        case IdleWithDoorOpen:
                break;
        case IdleWithDoorClose:
        MyState = IdlewithDoorOpen;

OnEntry();
                break;
        case Initial:
        MyState = cookingInterupted;

OnEntry();

break;
```

```
case Extended :
        MyState = CookingInterupted;
        OnEntry();
        break;
case CookingInterupted:
        break;
case CookingCompleted:
        MyState = IdlewithDoorOpen;
        OnEntry();
        break;
default :       // Should signal error here..
}
```

Example: Stack Machine



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