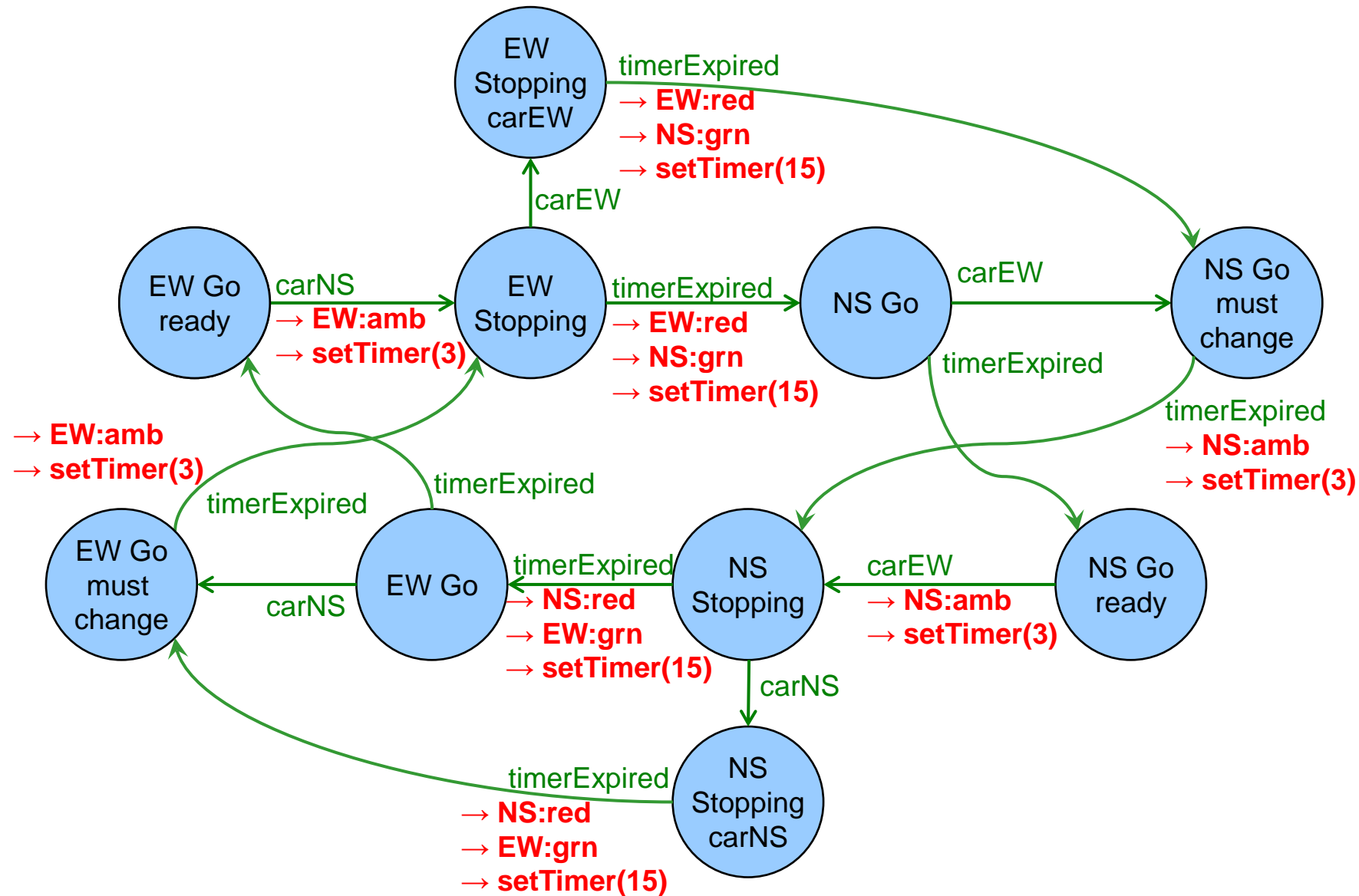# Engineering Technology (ENGR 101)
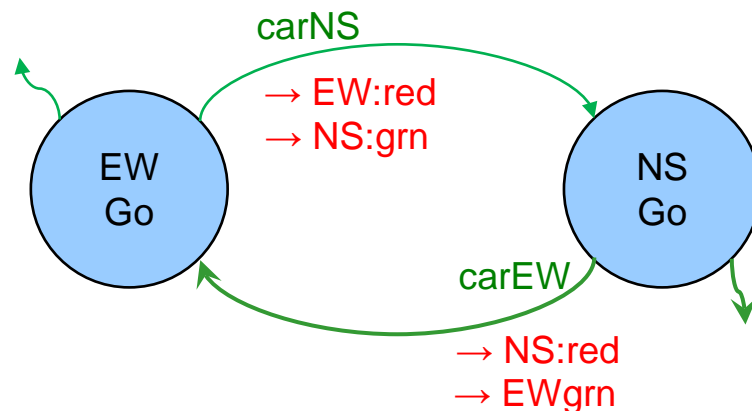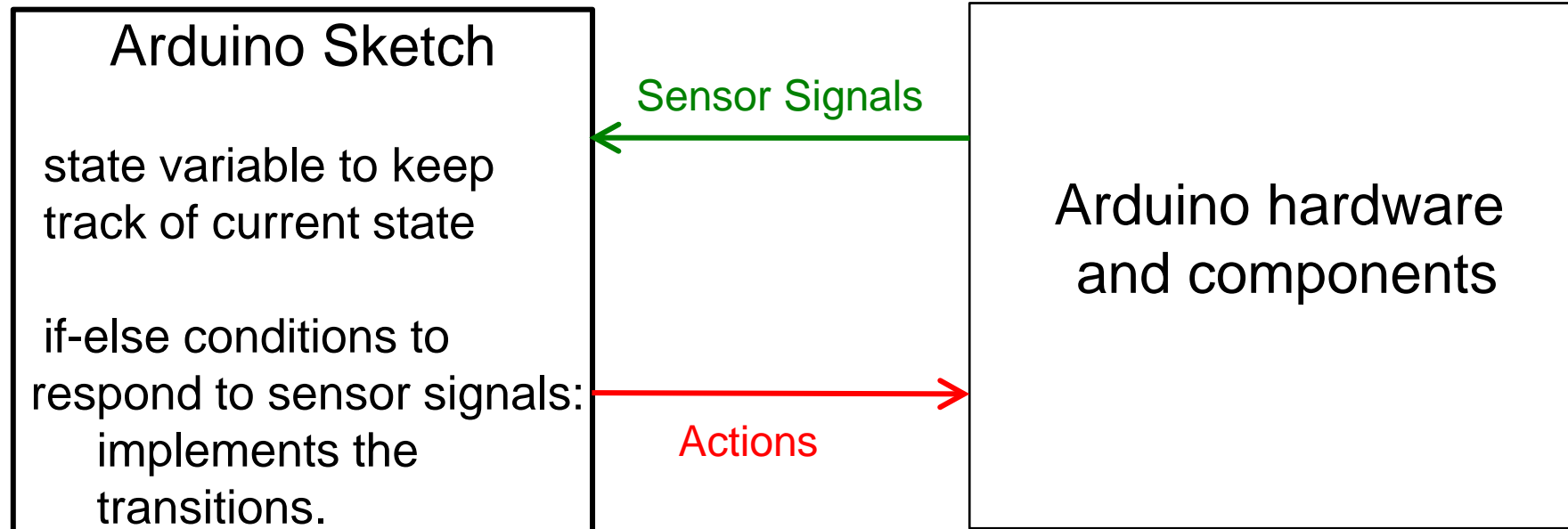
FSM implementation

Admin

- Assignment 1 has been released
  - Due date is March 31, 19:00 (Xiamen Time)
  - This assignment is individual. You must **NOT** work in groups.
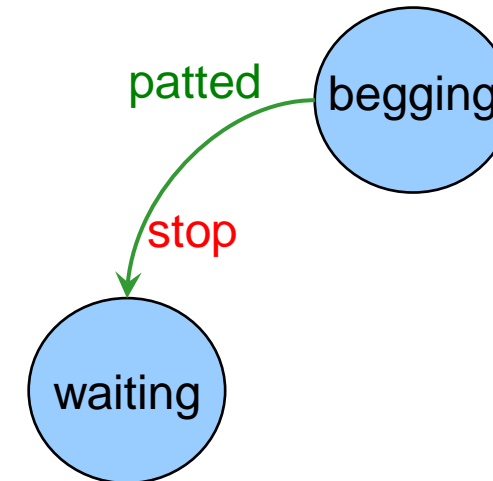
Traffic light controller for Lab 3

Implementing FSM Controllers

Implementing FSM Controllers

Program for controller:

- Global variable for current state
- **if-else** statements for implementing the transition function
  - given a sensor
  - depending on current state
  - choose transition for the sensor in that state
    - invoke actions on the system,
    - change the value of the current state

patted — begging

stop

waiting

```
if (state == "begging"){
    if (patted == HIGH){
        // stop the toy from begging
        State = "waiting";
    }
}
else ...
```

One of these for every arrow in diagram

How does the action get done?

Implementing FSM Controllers

```
String state = "EW Go"; //the current state
:
void loop(){
    :
    int carNS = readCarNS();
    int carEW = readCarEW();
    if (state == "EW Go"){ // transition out of EW Go state
        if (carNS == HIGH){
            turnEWred();
            turnNSgreen();
            state = "NS Go";
        }
    }
    else if (state == "NS Go"){// transition out of NS Go state
        if(carEW == HIGH) ){
            turnNSred();
            turnEWgreen();
            state = "EW Go";
        }
        else if(timerExpired ==  true)
        :
    }
    else if
    :
}
```

HIGH or LOW

```
void turnEWred(){
    digitalWrite(redEW, HIGH);
    digitalWrite(yellowEW, LOW);
    digitalWrite(greenEW, LOW);
}
```

carNS
→ EW:red
→ NS:grn

timerExpired

EW
Go

NS
Go

carEW
→ NS:red
→ EWgrn