



# Lecture (10)

## Practical Applications on Arduino Uno Board - II

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Dr. Ahmed ElShafee

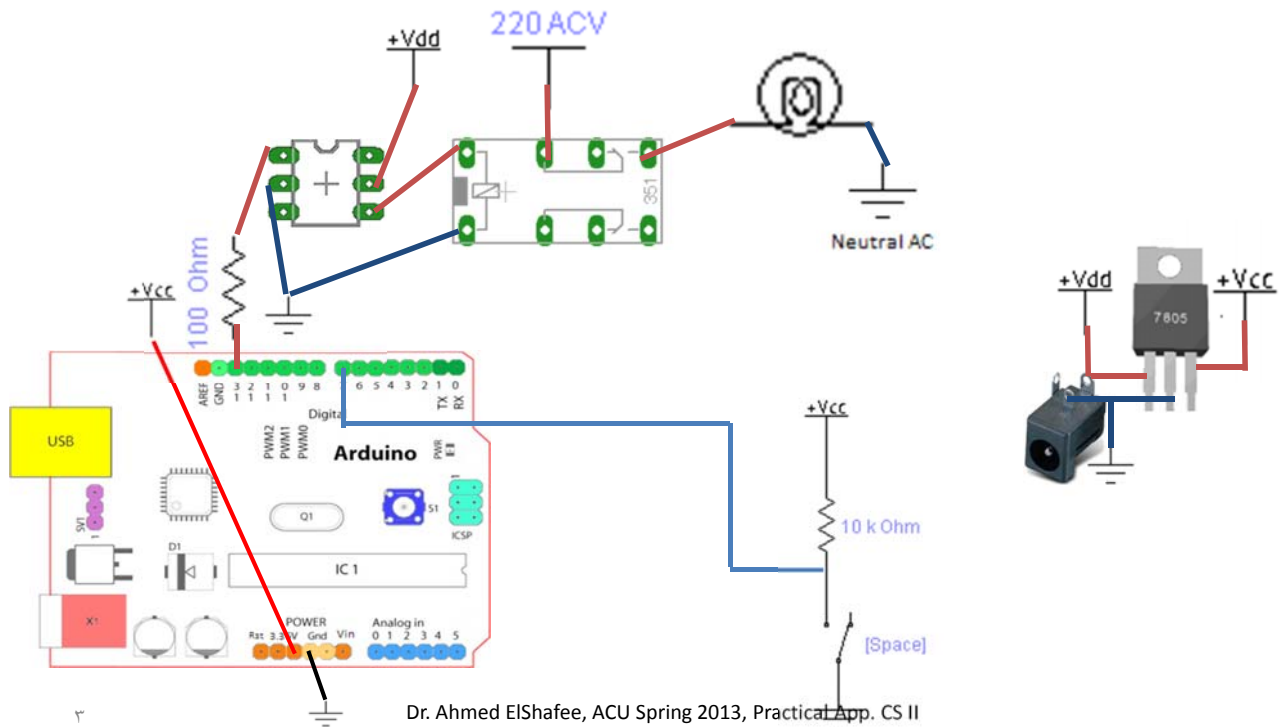
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### Agenda

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- \*
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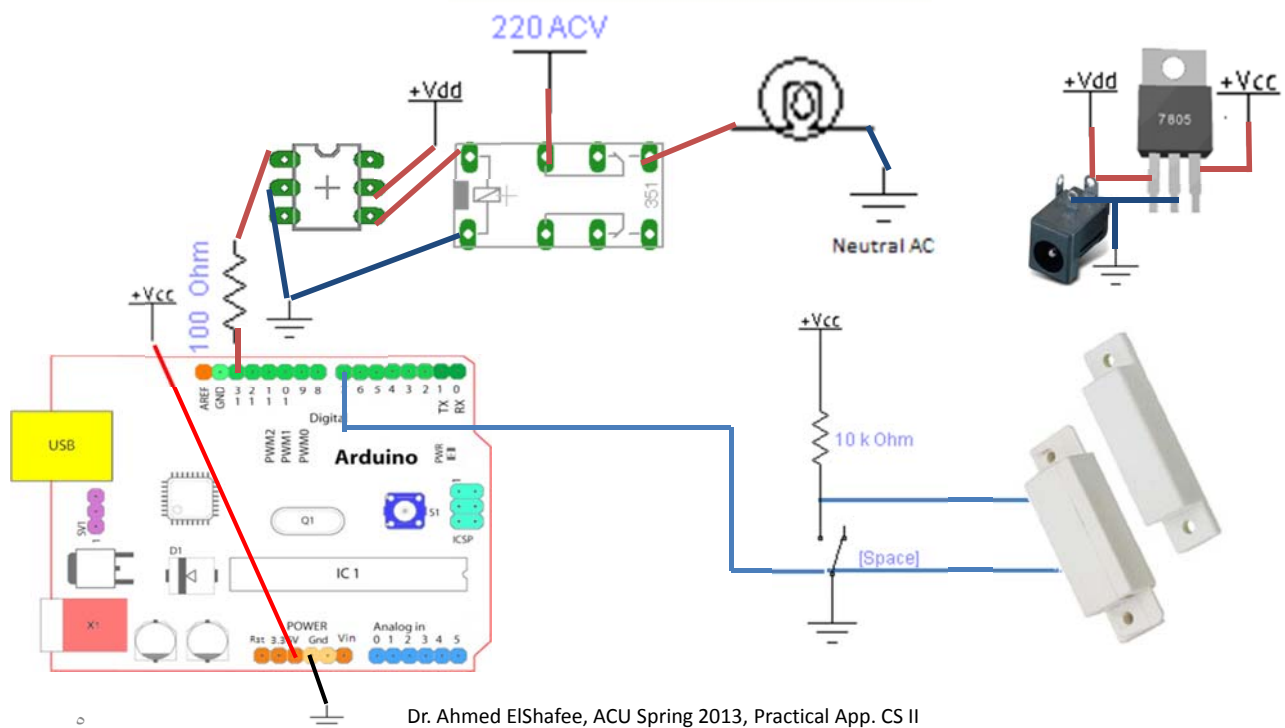
# PressControlledACLampToggleler



```
#define ACLamp 13
#define BUTTON 7 //press=high
int Button_status=0;
int ACLamp_status=0;
void setup()
{
  pinMode(ACLamp, OUTPUT);
  pinMode(BUTTON,INPUT);
}
void loop()
{
  Button_status=digitalRead(BUTTON);
  if(Button_status==HIGH)
  {
    delay(10);
```

```
Button_status=digitalRead(BUTTON);
if(Button_status==HIGH)
{
  if(ACLamp_status==LOW)
    ACLamp_status=HIGH;
  else
    ACLamp_status=LOW;
}
}
digitalWrite(ACLamp,ACLamp_status)
;
delay(1000);
}
```

# DoorControlledACLamp



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- Room Control Truth Table

Door	ACLamp (current)	ACLamp (Next)
Close	Off	Off
Close	On	Off
Open	Off	On
Open	On	On

# DoorControlledACLamp

```

#define ACLamp 13
#define Door 7
int Door_status=0; //close = low; open =
high
int ACLamp_status=0;
void setup()
{
  pinMode(ACLamp, OUTPUT);
  pinMode(Door,INPUT);
}
void loop()
{
  Door_status=digitalRead(Door);
  if((Door_status==LOW) &&
(ACLamp_status==0))
    ACLamp_status=0;

```

```

else if((Door_status==LOW) &&
(ACLamp_status==1))
  ACLamp_status=0;
else if((Door_status==HIGH)
&& (ACLamp_status==0))
  ACLamp_status=1;
else if((Door_status==HIGH)
&& (ACLamp_status==1))
  ACLamp_status=1;

digitalWrite(ACLamp,ACLamp_st
atus);;

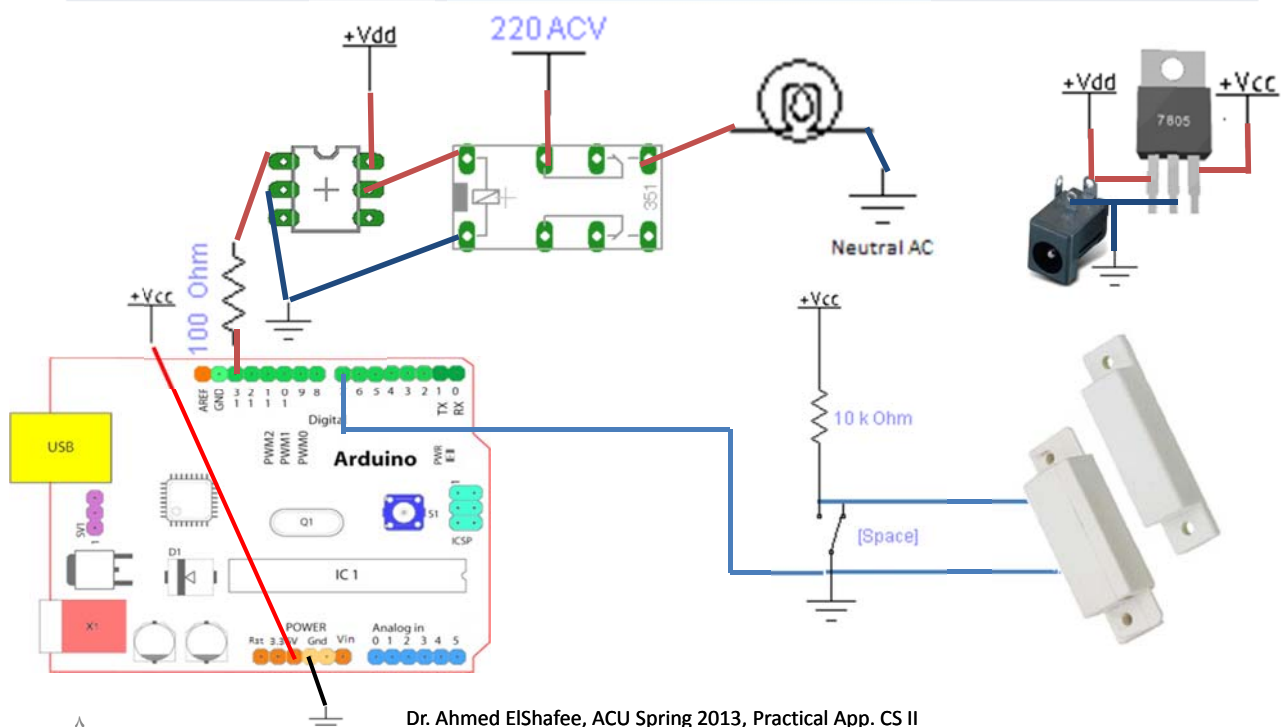
}

```

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# DoorControlledACLampWithTimer



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- Room Control Truth Table

#	Door	ACLamp (current)	Delay	ACLamp (Next)
1	Close	Off	0 sec	Off
2	Open	Off	0 sec	On
3	Open	On	0 sec	On
4	Close	On	5 sec	Off

---

- Room Control Truth Table

Door	ACLamp (current)	Delay	ACLamp (Next)
Close	Off	0 sec	Off
Close	On	5 sec	Off
Open	Off	0 sec	On
Open	On	0 sec	On

```

#define ACLamp 13
#define Door 7
int Door_status=0; //low close; high open
int ACLamp_status=0;
void setup()
{
  pinMode(ACLamp, OUTPUT);
  pinMode(Door,INPUT);
}
void loop()
{
  Door_status=digitalRead(Door);
  if((Door_status==LOW) &&
  (ACLamp_status==0))
    ACLamp_status=0;

```

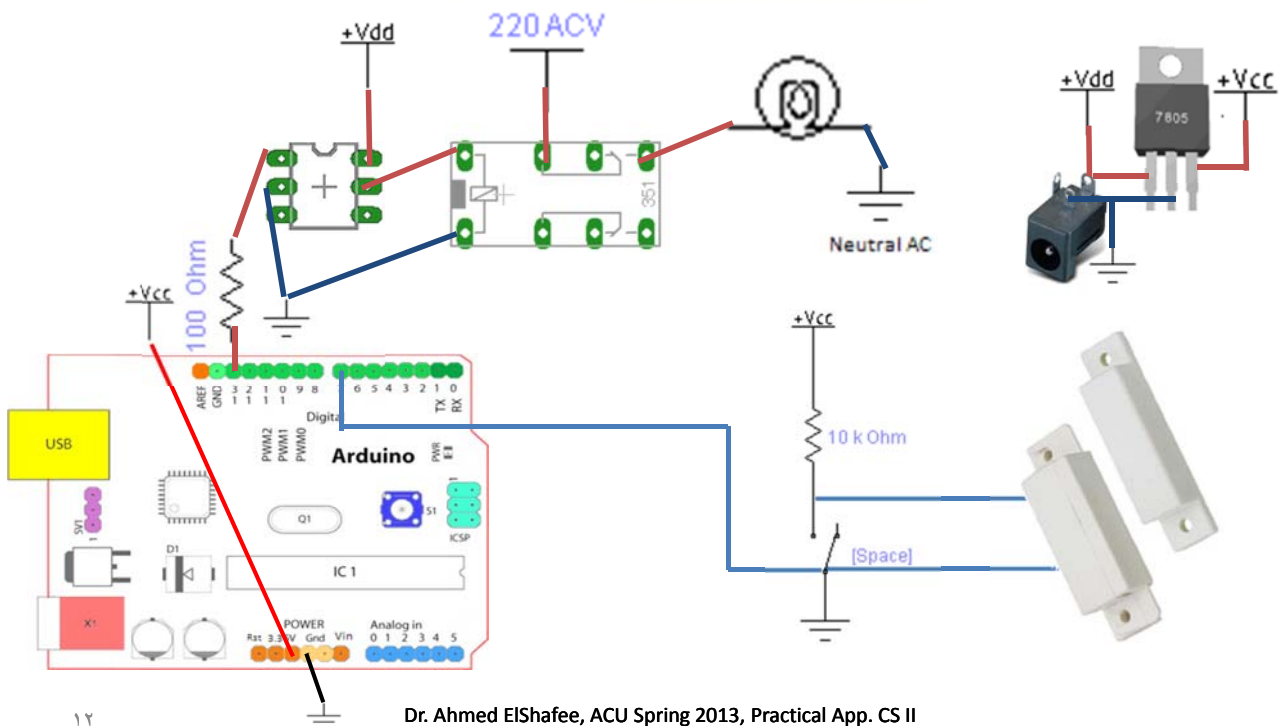
```

else if((Door_status==LOW) &&
  (ACLamp_status==1))
  {
    delay(5000);
    ACLamp_status=0;
  }
  else if((Door_status==HIGH) &&
  (ACLamp_status==0))
    ACLamp_status=1;
  else if((Door_status==HIGH) &&
  (ACLamp_status==1))
    ACLamp_status=1;

  digitalWrite(ACLamp,ACLamp_status);;
}

```

## DoorControlledACLampWithCounter



- Room Control Truth Table

#	Door	ACLamp (current)	Counter (current)	Delay	ACLamp (Next)	Counter (Next)
1	Close	Off	Odd	0	NC	NC
2	Open	Off	Odd	0	On	NC
3	Open	On	Odd	0	NC	NC
4	Close	On	Odd	0	NC	Counter ++
5	Close	On	Even	0	NC	NC
6	Open	On	Even	5 Sec	Off	NC
7	Open	Off	Even	0	NC	NC
8	Close	Off	Even	0	NC	Counter ++

- Room Control Truth Table

#	Door	ACLamp (current)	Counter (current)	Delay	ACLamp (Next)	Counter (Next)
1	Close	Off	Odd	0	NC	NC
8	Close	Off	Even	0	NC	Counter ++
4	Close	On	Odd	0	NC	Counter ++
5	Close	On	Even	0	NC	NC
2	Open	Off	Odd	0	On	NC
7	Open	Off	Even	0	NC	NC
3	Open	On	Odd	0	NC	NC
6	Open	On	Even	5 Sec	Off	NC

```

#define ACLamp 13
#define Door 7
int Door_status=0; //low close; high
open
int ACLamp_status=0;
void setup()
{
  pinMode(ACLamp, OUTPUT);
  pinMode(Door,INPUT);
}
void loop()
{
  Door_status=digitalRead(Door);
  if((Door_status==LOW) &&
(ACLamp_status==0))
    ACLamp_status=0;

```

```

else if((Door_status==LOW) &&
(ACLamp_status==1))
{
  delay(5000);
  ACLamp_status=0;
}
else if((Door_status==HIGH) &&
(ACLamp_status==0))
  ACLamp_status=1;
else if((Door_status==HIGH) &&
(ACLamp_status==1))
  ACLamp_status=1;

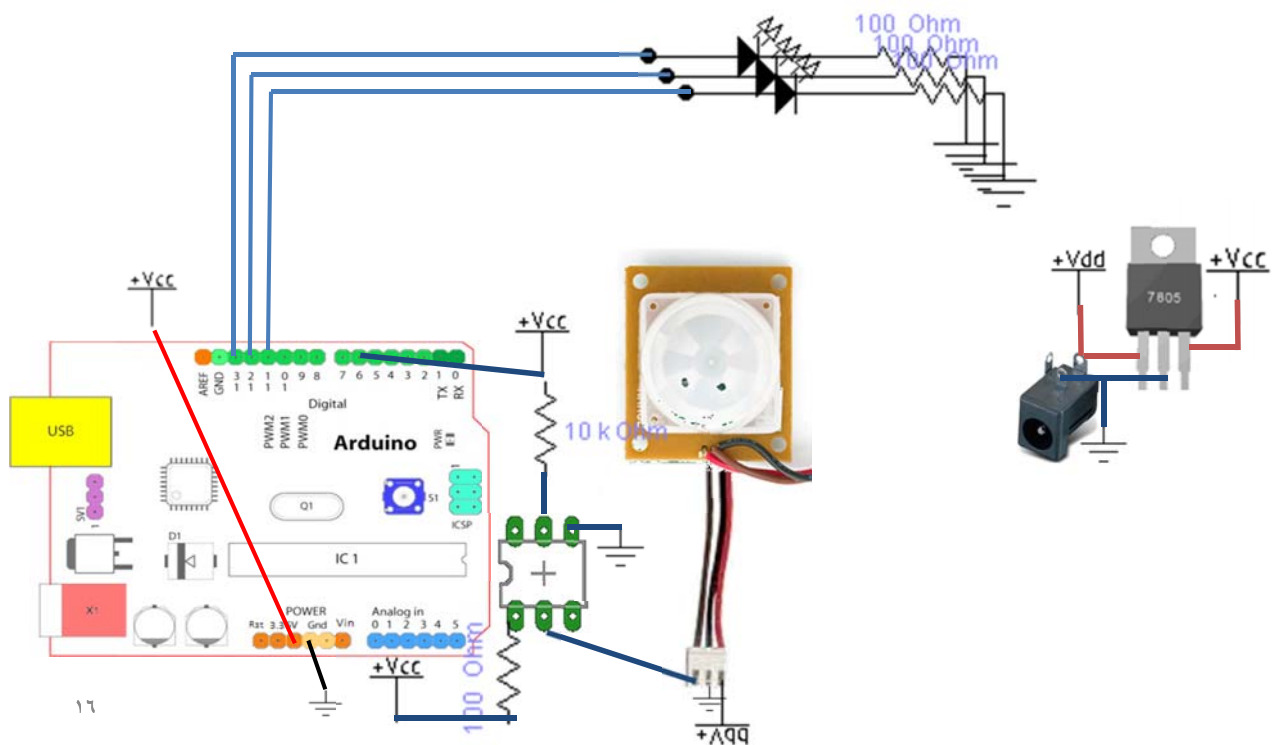
digitalWrite(ACLamp,ACLamp_status);;
}

```

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## MovementContrtrolledLED



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```

#define MovementLed 13
#define AlarmLed 12
#define TimerLed 11
#define PIR 6
int PIR_status=0; //Movement =
LOW; NoMovment=High
int MovementLed_status=0;
int TimerLedStatus=0;
void setup()
{
  pinMode(MovementLed, OUTPUT);
  pinMode(AlarmLed, OUTPUT);
  pinMode(TimerLed, OUTPUT);
  pinMode(PIR,INPUT);
  for(int x=0;x<100;x++)
  {
    delay(100);

```

```

if(TimerLedStatus==0)TimerLedStatus=HI
GH;
  else TimerLedStatus=LOW;
  digitalWrite(TimerLed,TimerLedStatus);
  }
}
void loop()
{
  PIR_status=digitalRead(PIR);
  if(PIR_status==LOW)
  MovementLed_status=1;
  else MovementLed_status=0;

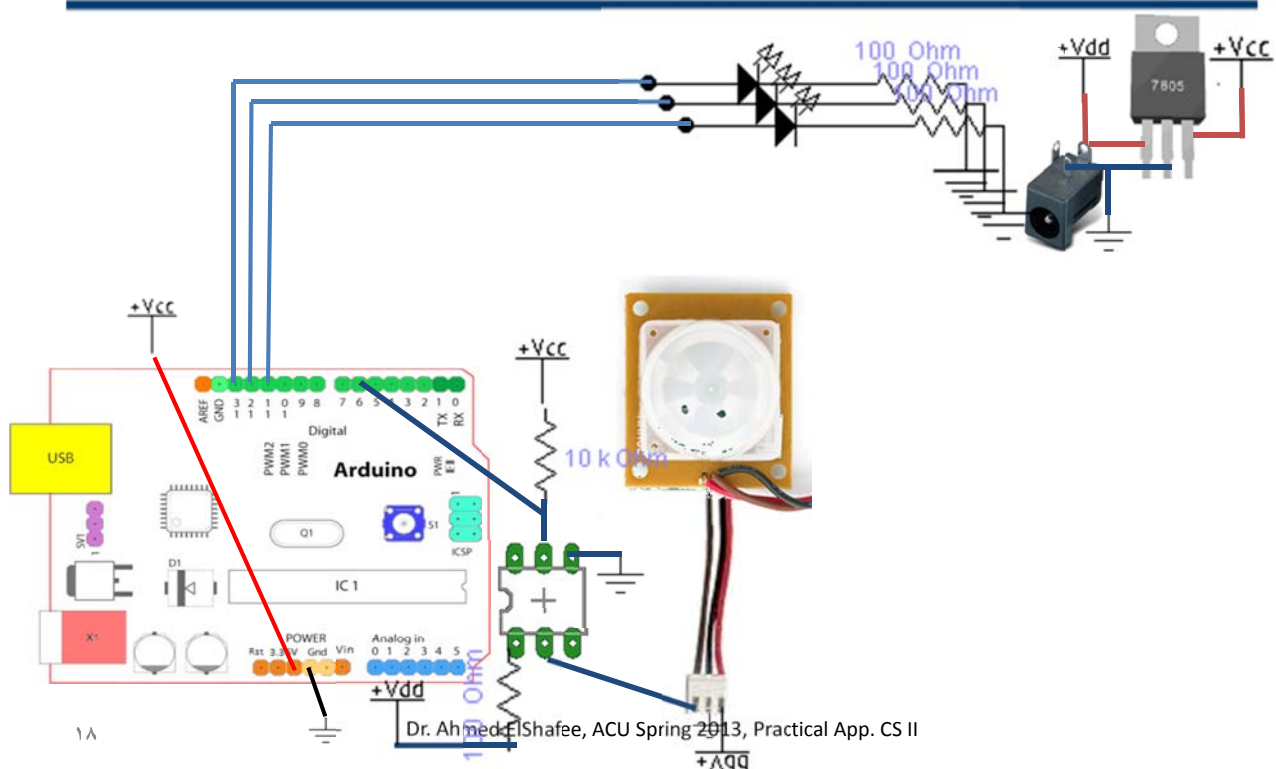
  digitalWrite(MovementLed,MovementLed_
status);
  digitalWrite(AlarmLed,MovementLed_statu
s);
}

```

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## MovementContrtrolledLEDWithTimer



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```

#define MovementLed 13
#define AlarmLed 12
#define TimerLed 11
#define PIR 6
int PIR_status=0; //Movement =
LOW; NoMovment=HIGH
int MovementLed_status=0;
int TimerLedStatus=0;
int AlarmStatus=0;
int counter=0;
void setup()
{
  pinMode(MovementLed,
OUTPUT);
  pinMode(AlarmLed, OUTPUT);
  pinMode(TimerLed, OUTPUT);
  pinMode(PIR,INPUT);
  for(int x=0;x<50;x++)
  {

```

```

delay(100);

if(TimerLedStatus==0)TimerLedStatus
=HIGH;
  else TimerLedStatus=LOW;

digitalWrite(TimerLed,TimerLedStatus
);
  }
}
void loop()
{
  PIR_status=digitalRead(PIR);
  if(PIR_status==LOW)
  {MovementLed_status=1;AlarmStatus
=1;counter=0;}
  else
  {MovementLed_status=0;counter++;}
  delay(100);

```

```

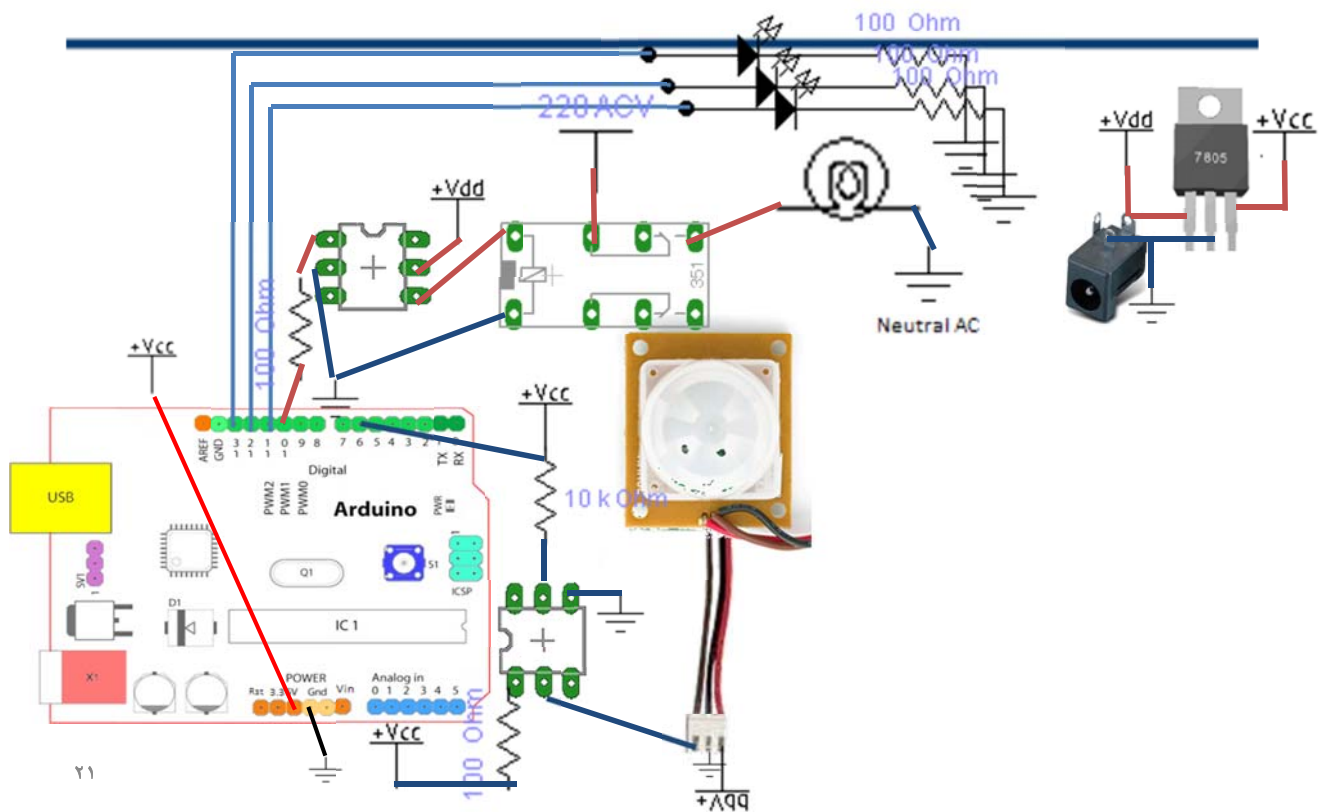
if(counter==50)
  {
    AlarmStatus=0;
    TimerLedStatus=0;
    counter=0;
  }
if(AlarmStatus==1)
{

if(TimerLedStatus==0)TimerLedStatus=1;
  else TimerLedStatus=0;
  }

digitalWrite(MovementLed,MovementLed_
status);
  digitalWrite(AlarmLed,AlarmStatus);
  digitalWrite(TimerLed,TimerLedStatus);
}

```

# MovementControlledACLamp



```
#define MovementLed 13
#define AlarmLed 12
#define TimerLed 11
#define PIR 6
#define ACLamp 10
int PIR_status=0; //Movement =
High; NoMovment=LOW
int MovementLed_status=0;
int TimerLedStatus=0;
int AlarmStatus=0;
int counter=0;
int ACLampStatus=0;
void setup()
{
  pinMode(MovementLed,
OUTPUT);
  pinMode(AlarmLed, OUTPUT);
  pinMode(TimerLed, OUTPUT);
```

```
pinMode(ACLamp, OUTPUT);
pinMode(PIR,INPUT);
for(int x=0;x<50;x++)
{
  delay(100);
  if(TimerLedStatus==0)TimerLedStatus=HI
GH;
  else TimerLedStatus=LOW;
  digitalWrite(TimerLed,TimerLedStatus);
}
}
void loop()
{
  PIR_status=digitalRead(PIR);
  if(PIR_status==LOW)
  {MovementLed_status=1;AlarmStatus=1;c
ounter=0;ACLampStatus=1;}
```

```

else
{MovementLed_status=0;if(counter<
100)counter++;}
delay(100);
if(counter>=50)
{
AlarmStatus=0;
}
if(counter>=100)
{
ACLampStatus=0;
TimerLedStatus=0;
counter=0;
}
if(ACLampStatus==1)
{
if(TimerLedStatus==0)TimerLedStat
us=1;

```

```

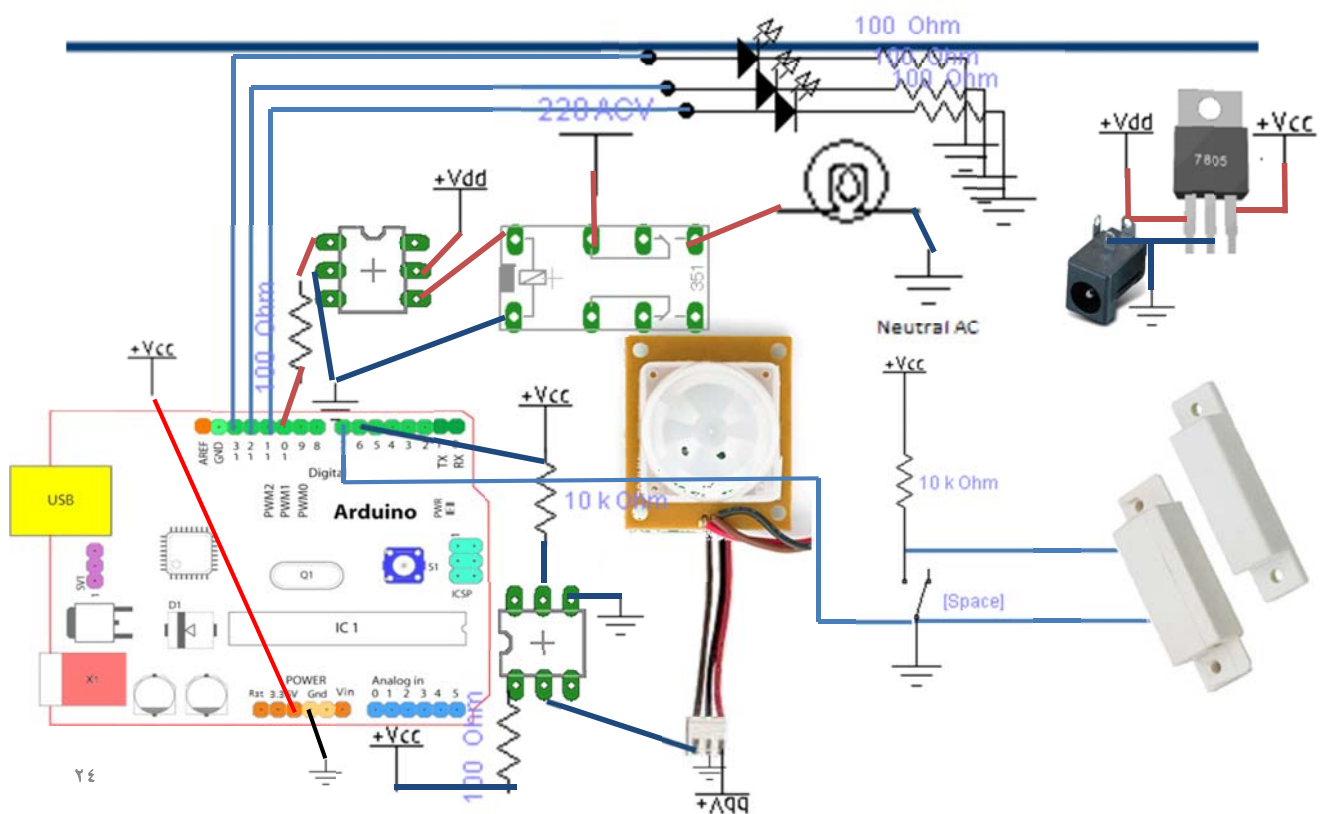
else TimerLedStatus=0;
}
digitalWrite(MovementLed,MovementL
ed_status);
digitalWrite(AlarmLed,AlarmStatus);
digitalWrite(ACLamp,ACLampStatus);

digitalWrite(TimerLed,TimerLedStatus);
}

```

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## MovementAndDoorContrtrolledACLamp



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If door : open → lamp : on

Else if door : close

    if move → lamp : on

    else → delay; lamp : off

---

```
#define MovementLed 13
#define AlarmLed 12
#define TimerLed 11
#define PIR 6
#define ACLamp 10
#define door 7
int PIRStatus=0; //Movement =
High; NoMovment=LOW
int MovementLedStatus=0;
int TimerLedStatus=0;
int AlarmStatus=0;
int counter=0;
int ACLampStatus=0;
int DoorStatus=0;
```

```
void setup()
{
  pinMode(MovementLed, OUTPUT);
  pinMode(AlarmLed, OUTPUT);
  pinMode(TimerLed, OUTPUT);
  pinMode(ACLamp, OUTPUT);
  pinMode(PIR,INPUT);
  pinMode(door,INPUT);
  for(int x=0;x<50;x++)
  {
    delay(100);

    if(TimerLedStatus==0)TimerLedStatus=HIGH;
    else TimerLedStatus=LOW;
    digitalWrite(TimerLed,TimerLedStatus);
  }
}
```

```

void loop()
{
  PIRStatus=digitalRead(PIR);
  DoorStatus=digitalRead(door);
  if(PIRStatus==LOW)
  {MovementLedStatus=1;AlarmStatus=
  1;counter=0;}
  else
  {MovementLedStatus=0;if(counter<10
  0)counter++;}
  delay(100);
  if(counter>=50)
  {
    AlarmStatus=0;
    TimerLedStatus=0;
  }
  if(AlarmStatus==1)
  {

```

```

if(TimerLedStatus==0)TimerLedStatus
=1;
  else TimerLedStatus=0;
  }
  if(DoorStatus==HIGH)
  {
    ACLampStatus=1;
  }
  else if(DoorStatus==LOW)
  {
    if(AlarmStatus==1)
    {
      ACLampStatus=1;
    }
    else if(AlarmStatus==0)
    {
      if(counter>=100)

```

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```

ACLampStatus=0;
  }
}

digitalWrite(MovementLed,MovementLedSt
atus);
digitalWrite(AlarmLed,AlarmStatus);
digitalWrite(ACLamp,ACLampStatus);
digitalWrite(TimerLed,TimerLedStatus);
}

```

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Thanks,  
See you next Week, isA