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Control-of-Relay-Using-IoT-controller

NAME:NAVEENKUMAR

REF NO:24900580

AIM:

To control the Relay using Arduino controller

Software required:

Arduino IDE

Proteus

PROCEDURE:

Arduino IDE

Step1:Open the Arduino IDE

Step2: Go to file and select new file option

Step3:Type the program

Step4:Go to file and select save option to save the program

Step5:Go to sketch and select verify or compile options

Step6:If no error Hex file will be generated in the temporary folder

Proteus

Step7:Open the Proteus software

Step8:Go to file select new design and click ok button

Step9:Select component mode and click pick devices from the library

Step10:Type the component name in the keyword to select the components and click ok button

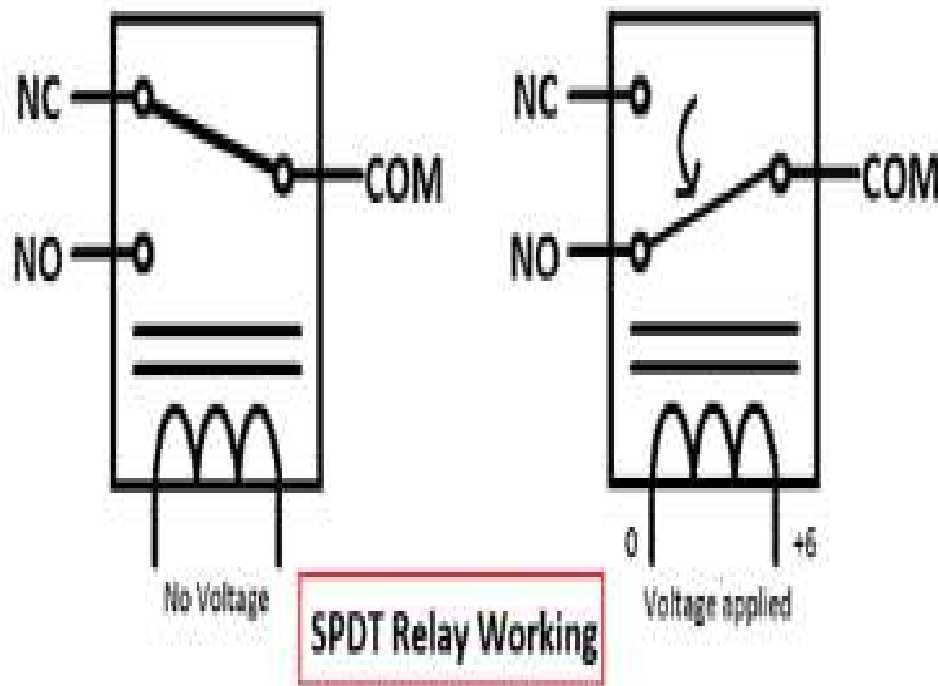
Step11:Design the circuit as per the diagram

Step12:Double click the Arduino controller and upload the hex file generated by Arduino IDE

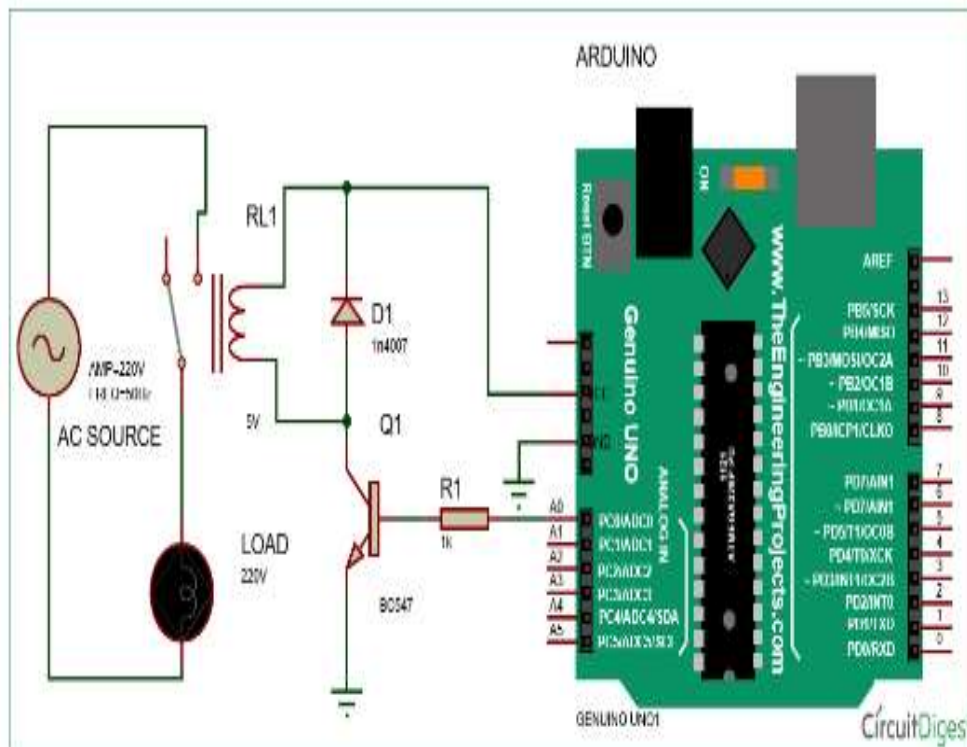
Step13:Click start button and check the output

THEORY:

LED Blinking is a very common and almost first program for every embedded learner or beginner. In which we blink an LED with having some delay. So today we are here with the same project but here we will use an AC bulb instead of normal LED and will blink an AC bulb. Whenever we need to connect any AC Appliance in our embedded circuits, we use a Relay. So in this arduino relay control tutorial we will simply learn How to interface a Relay with Arduino. Here we are not using any Relay Driver IC like ULN2003 and will only use an NPN transistor to control relay. Relay is an electromagnetic switch, which is controlled by small current, and used to switch ON and OFF relatively much larger current. Means by applying small current we can switch ON the relay which allows much larger current to flow. A relay is a good example of controlling the AC (alternate current) devices, using a much smaller DC current. Commonly used Relay is Single Pole Double Throw (SPDT) Relay, it has five terminals as below

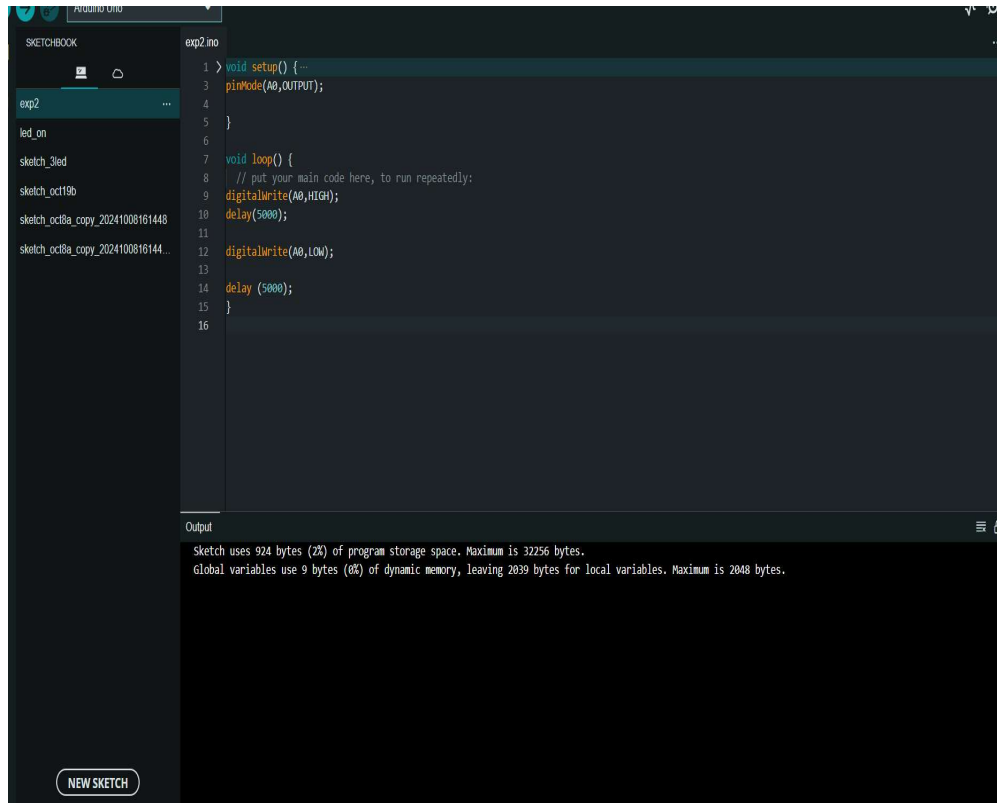


When there is no voltage applied to the coil, COM (common) is connected to NC (normally closed contact). When there is some voltage applied to the coil, the electromagnetic field produced, which attracts the Armature (lever connected to spring), and COM and NO (normally open contact) gets connected, which allow a larger current to flow. Relays are available in many ratings, here we used 6V operating voltage relay, which allows 7A-250VAC current to flow. The relay is always configured by using a small Driver circuit which consists a Transistor, Diode and a resistor. Transistor is used to amplify the current so that full current (from the DC source – 9v battery) can flow through a coil to fully energize it. The resistor is used to provide biasing to the transistor. And Diode is used to prevent reverse current flow, when the transistor is switched OFF. Every Inductor coil produces equal and opposite EMF when switched OFF suddenly, this may cause permanent damage to components, so Diode must be used to prevent reverse current. Here to turn on the Relay with Arduino we just need to make that Arduino Pin High (A0 in our case) where Relay module is connected



In this Arduino Relay Control Circuit we have used Arduino to control the relay via a BC547 transistor. We have connected transistor base to Arduino pin A0 through a 1k resistor. An AC bulb is used for demonstration. Working is simple, we need to make the RELAY Pin (PIN A0) high to make the Relay module ON and make the RELAY pin low to turn off the Relay Module. The AC light will also turn on and off according to Relay.

PROGRAM:



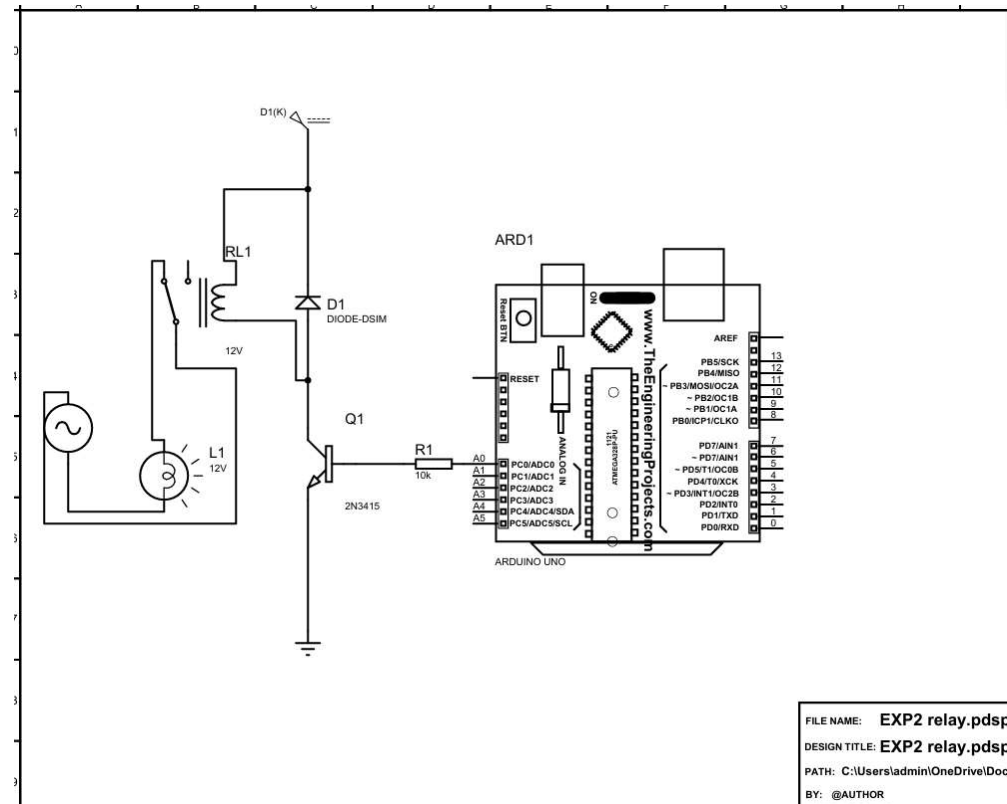
```
1 > void setup() { ...
2 pinMode(A0, OUTPUT);
3
4
5 }
6
7 void loop() {
8   // put your main code here, to run repeatedly:
9   digitalWrite(A0, HIGH);
10  delay(5000);
11
12  digitalWrite(A0, LOW);
13
14  delay(5000);
15 }
16
```

Output

Sketch uses 924 bytes (2%) of program storage space. Maximum is 32256 bytes.
Global variables use 9 bytes (0%) of dynamic memory, leaving 2039 bytes for local variables. Maximum is 2048 bytes.

NEW SKETCH

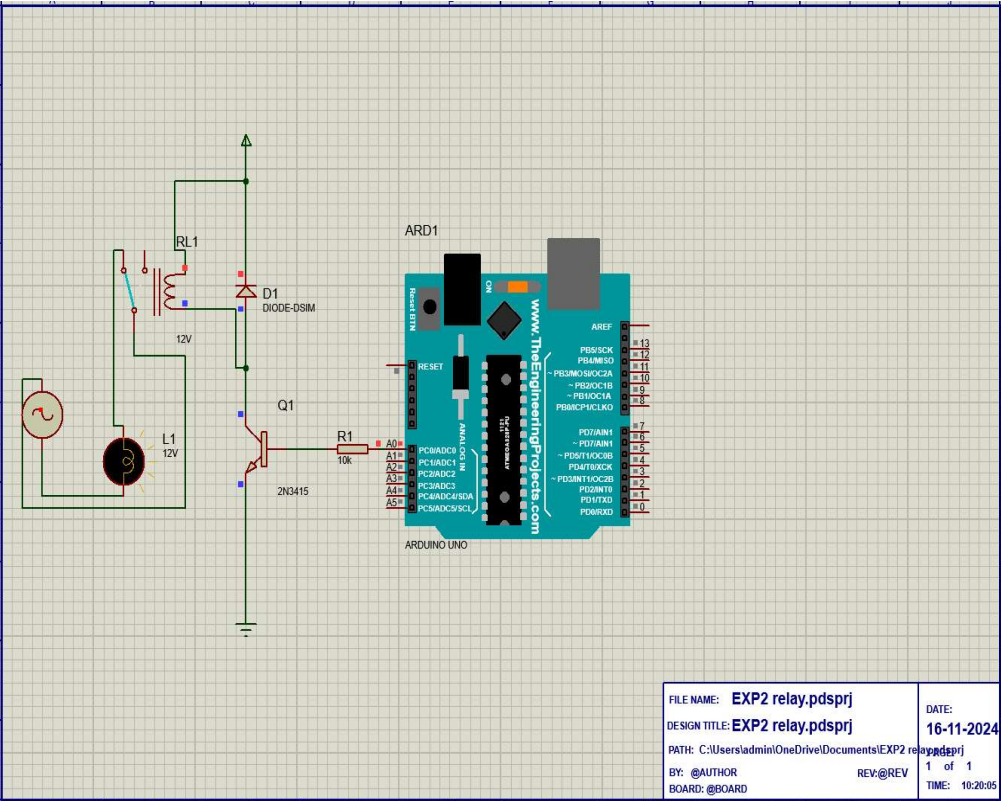
CIRCUIT DIAGRAM:



OUTPUT:

BULB OFF





RESULT:

Thus the relay is controlled using Arduino controller successfully.