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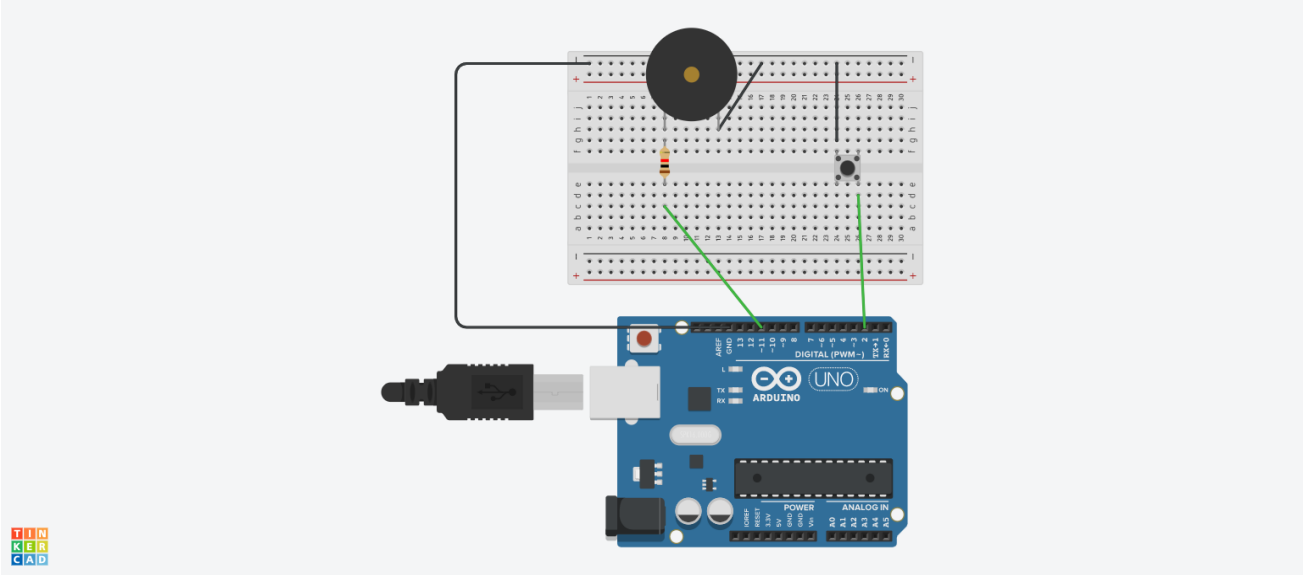
Div: A (BCA Sem-4)
Topic: IOT lab assignment

Experiment 1:

Q. Design an arudino based call bell system. Use push button and buzzer. Buzzer must beep with a 1.5KHz Note when the push button is pressed.

Diagram:



Sketch:

```
int val=0;
const int buzzer=11;  //pwd pin
const int switchIP=2;  //input pin to read the state of the switch.

void setup()
{
  pinMode(buzzer, OUTPUT);

  //pin 2 will have 5v to it i.e by default value 1/HIGH.
  pinMode(switchIP, INPUT_PULLUP);  //adding a pull up resistor

  Serial.begin(9600);

}

void loop()
{
```

```
  //When we press the button the current is drawn to the ground
  //as setting the pin to pull up resistor the impedance will be high.
  if(digitalRead(switchIP)==0)
  {
    tone(buzzer,1500);
  }
  else
  {
    noTone(buzzer);
  }
  val=digitalRead(switchIP);
  Serial.println(val);
}
```

Description of the experiment:

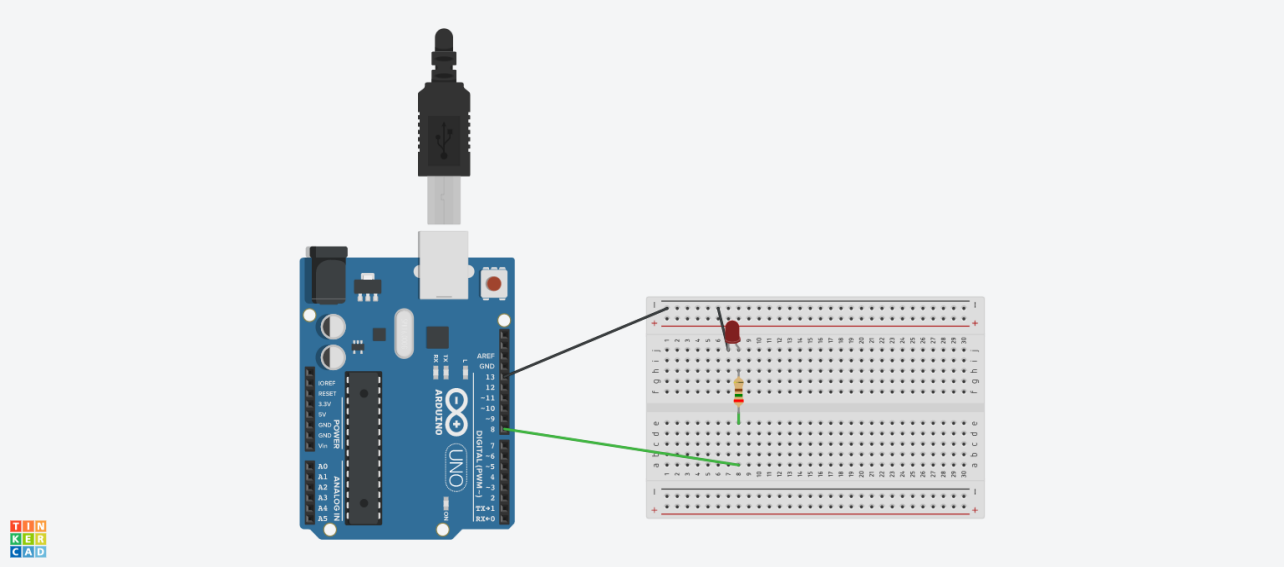
It's an arduino based call bell system. The push button is attached to pull-up resistor which pulls up it's state(when open) to HIGH , when the push-button is pressed(closed circuit) the current will flow through the path of least resistance(GND) thus input read of pin 2 will be 0/LOW.

Therefore when the push-button state is 0/LOW the buzzer is activated with a 1.5kHz note otherwise the buzzer is deactivated.

Experiment 2:

Q. Dubstep is a genre of Electronic dance Music that originated in South London in the late 1990s. It is generally characterised by sparse, syncopated rhythmic patterns with prominent sub-bass frequencies. (Source :wiki). A tempo of 140 Beats Per Minute is a common note here. Design an LED blink program with 140 BPM to support the musicians of this genre.

Diagram:



Sketch:

```
const int led=8;  //pin to control the led

void setup()
{
  pinMode(led,OUTPUT);  //setting led pin as output
  Serial.begin(9600); //for debugging purpose.
}

void loop()
{
  //we want 140BPM i.e 60000ms/140 = 1 beat in every 428.57ms.
  double val=(double)60000/140;

  //debug purpose
  //Serial.println(val);
  //Serial.println((double)val/2);


  //Since a blink consist of "on" and "off" state of the led
  //we “on” it for 214.29ms and the “off” it for 214.29ms
  digitalWrite(led,1);
  delay((double)val/2);
  digitalWrite(led,0);
  delay((double)val/2);
}
```

Description of the experiment:

A simple led blinking program to make the led have 140 blinks per minute. The led is connected to pin number 8 on the arduino board and has a resistor in series with it, when the program is activated the led blinks 140 times per minute.

Calculation of delay:
Since we want 140 blinks per minute(60,000ms) I.e we want 60000/140 = 1 blink in every 428.57ms, since a blink consist of a “on” and “off” state of the led, we “on” the led for 214.29ms and the “off” it for 214.29ms.