SOUND LOGGER SYSTEM

1) VIVEK JAMBHULKAR

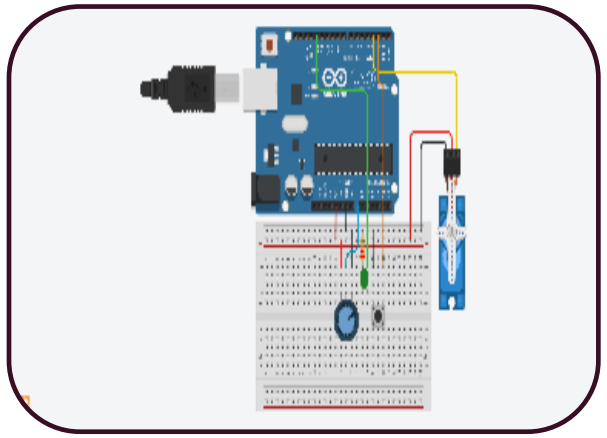
2) ADITYA DANGE

3) ANIDH CHAVAN

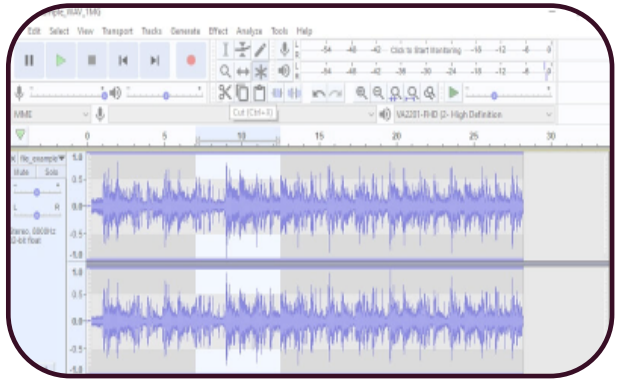
4) SANSKAR AYAKAR

MINI PROJECT REVIEW
MENTOR = KADER SHAIKH SIR

Working of an Spy Audio Recorder

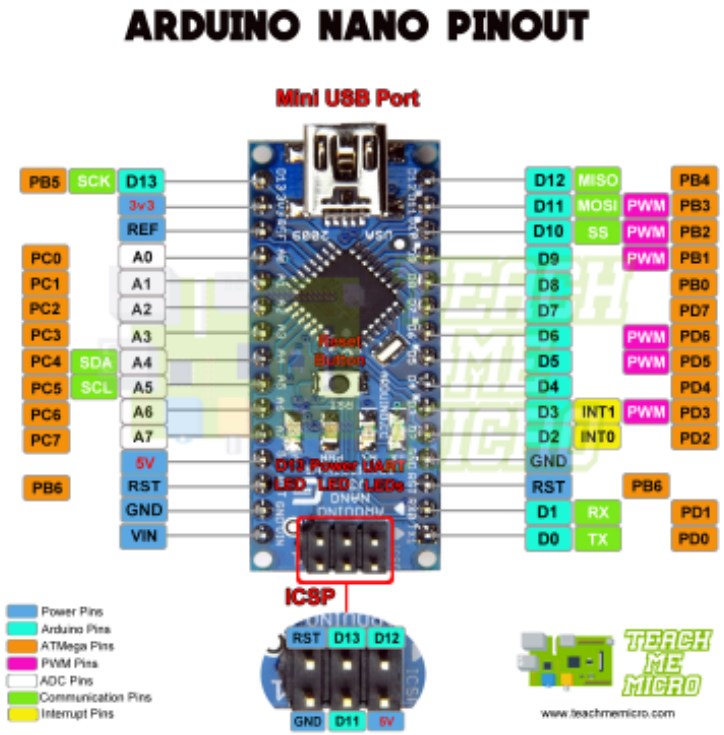


- For audio recording , require two main components _
- Microphone and computer
- It creates electrical voltage of sound when hit it
- Computer stores these analog voltages in form of frequency (Hz)



Arduino Nano

- The **Arduino Nano** is a small Arduino board based on **ATmega328P** or ATmega628 Microcontroller.
- The Nano board is defined as a sustainable, small, consistent, and flexible microcontroller board. It is small in size compared to the UNO board. The Arduino Nano is organized using the Arduino (IDE), which can run on various platforms. Here, IDE stands for Integrated Development Environment.



Technical Specifications

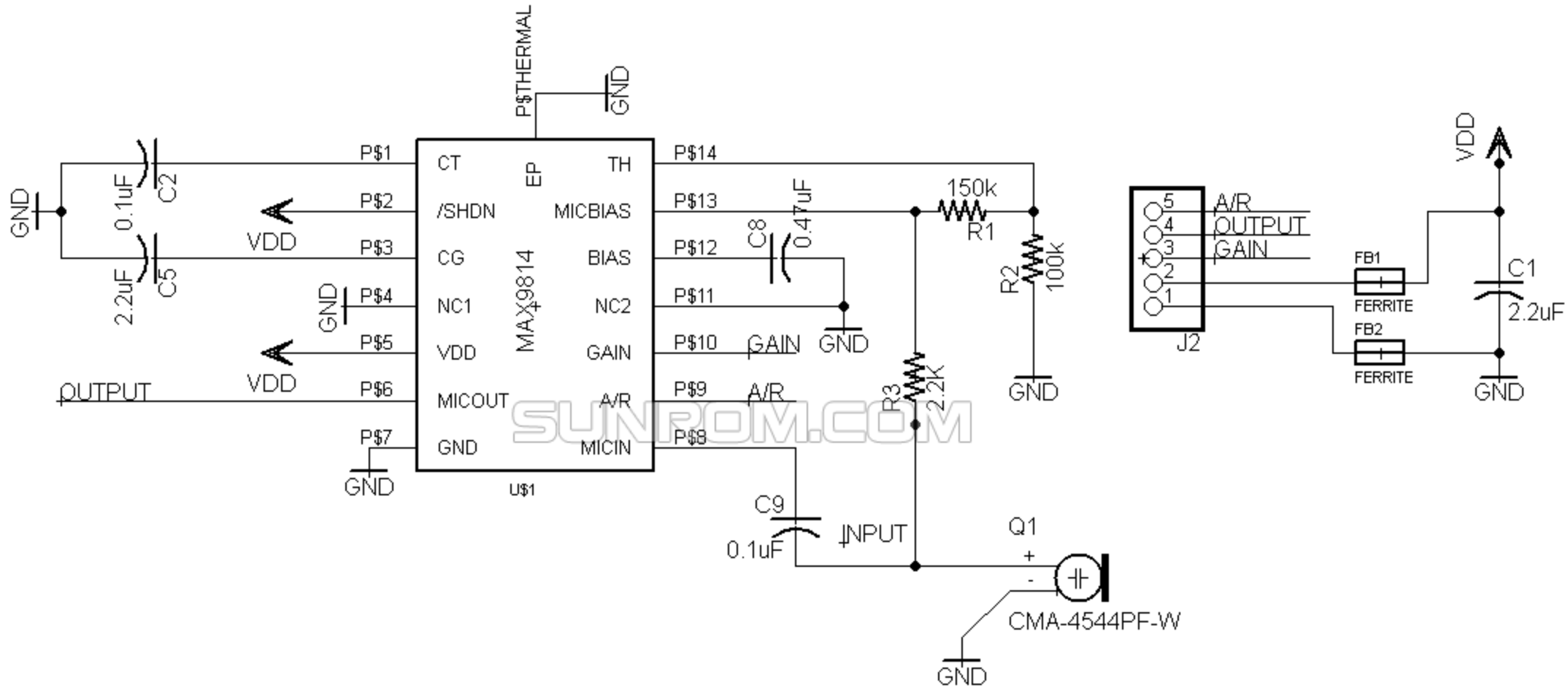
The technical specifications of the Arduino Nano board are:

- The operating voltage of the Nano board varies from 5V to 12V.
- The total pins in Nano are 22 Input/Output pins.
- There are 14 digital pins and 8 analog pins.
- There are 6 PWM (Pulse Width Modulation) pins among the 14 digital pins. The 6 PWM pins in Arduino Nano are used to convert the digital signals into the analog signals. The conversion takes place by varying the width of the pulse.
- The crystal oscillator present in Arduino Nano comes with a frequency of 16MHz.
- The Arduino Nano is used in various applications such as **Robotics, Control System, Instrumentation, Automations, and Embedded Systems.**
- The projects created using Arduino Nano are **QR Code Scanner, DIY Arduino Pedometer, etc.**
- We can also connect Arduino Nano to the Wifi.
- The functionality of Nano is similar to the Arduino UNO.
- The flexibility and eco-friendly nature of Nano make it a unique choice to create electronic devices and projects with compact size.

The MAX9814 is a low-cost, high-quality microphone amplifier with automatic gain control (AGC) and low-noise microphone bias. The device features a low-noise preamplifier, variable gain amplifier (VGA), output amplifier, microphone-bias-voltage generator, and AGC control circuitry.

Features

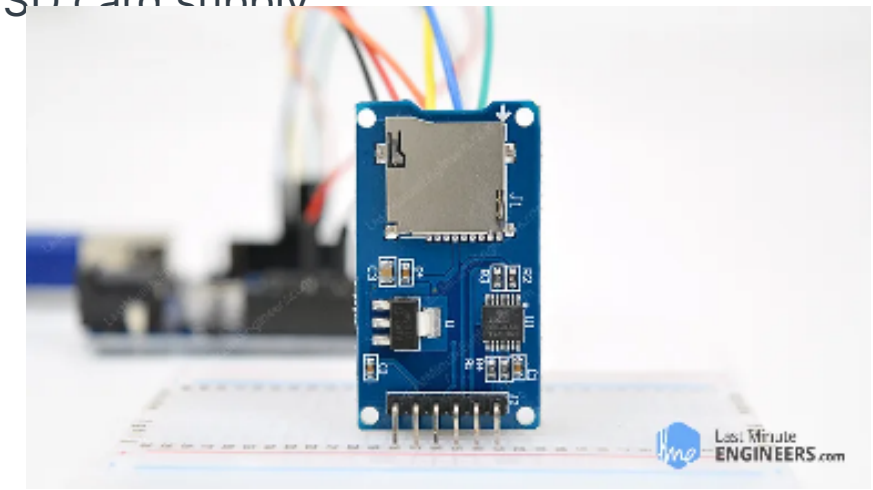
- Automatic Gain Control (AGC)
- Three Gain Settings (40dB, 50dB, 60dB)
- Programmable Attack Time
- Programmable Attack and Release Ratio
- 2.7V to 5.5V Supply Voltage Range
- Low Input-Referred Noise Density of 30nV/√Hz
- Low THD: 0.04% (typ)
- Low-Power Shutdown Mode
- Internal Low-Noise Microphone Bias, 2V
- Available in the Space-Saving, 14-Pin TDFN (3mm x 3mm) Package
- -40°C to +85°C Extended Temperature Range


P$THERMAL
GND
P$1
P$2
P$3
P$4
P$5
P$6
P$7
CT
/SHDN
CG
NC1
VDD
MICOUT
GND
EP
MAX9814
TH
MICBIAS
BIAS
NC2
GAIN
A/R
MICIN
P$14
P$13
P$12
P$11
P$10
P$9
P$8
U$1
GND
0.1uF
C2
2.2uF
C5
VDD
VDD
OUTPUT
GND
C8
0.47uF
GAIN
GND
150k
R1
R2
100k
GND
R3
2.2K
C9
0.1uF
INPUT
Q1
+
-
CMA-4544PF-W
GND
5
4
3
2
1
A/R
OUTPUT
GAIN
J2
FB1
FERRITE
FB2
FERRITE
VDD
C1
2.2uF
GND

MICRO SD ADAPTER

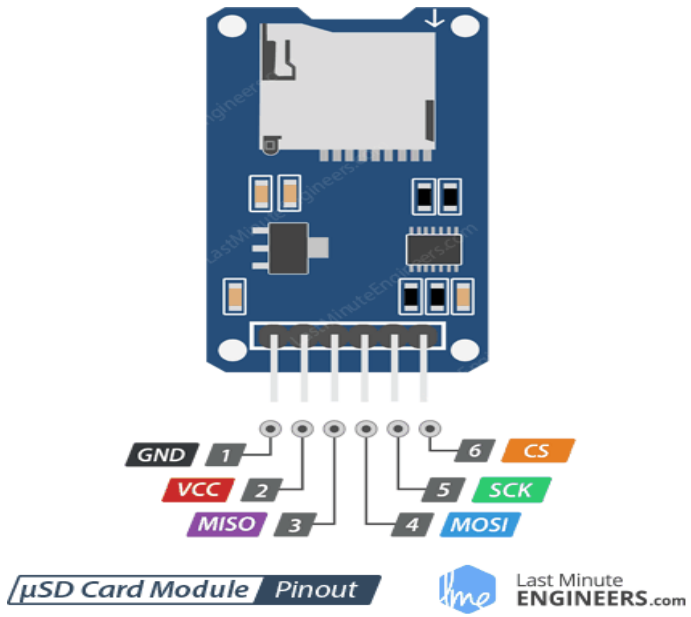
Micro SD Card Reader Module also called Micro SD Adaptor which is designed for dual I/O voltages. The Module is a simple solution for transferring data to and from a standard SD card. The pinout is directly compatible with Not only with Arduino as shown in the diagram in below, but can also be used with other microcontrollers. Micro SD Card Reader Module has an SPI interface which is compatible with any sd card and it uses 5V or 3.3V power supply which is compatible with Arduino UNO/Mega.SD module has various applications such as data logger, audio, video, graphics.

There are total of six pins (GND, VCC, MISO, MOSI, SCK, CS), GND to ground, VCC is the power supply, MISO, MOSI, SCK is the SPI bus, CS is the chip select signal pin; 3.3V regulator circuit: LDO regulator output 3.3V as level converter chip, Micro SD card supply



Features:

- Support Micro SD Card (<=2G), Micro SDHC card (<=32G) (high-speed card)
- The level conversion circuit board that can interface level is 5V or 3.3V
- Power supply is 4.5V ~ 5.5V, 3.3V voltage regulator circuit board
- Communication interface is a standard SPI



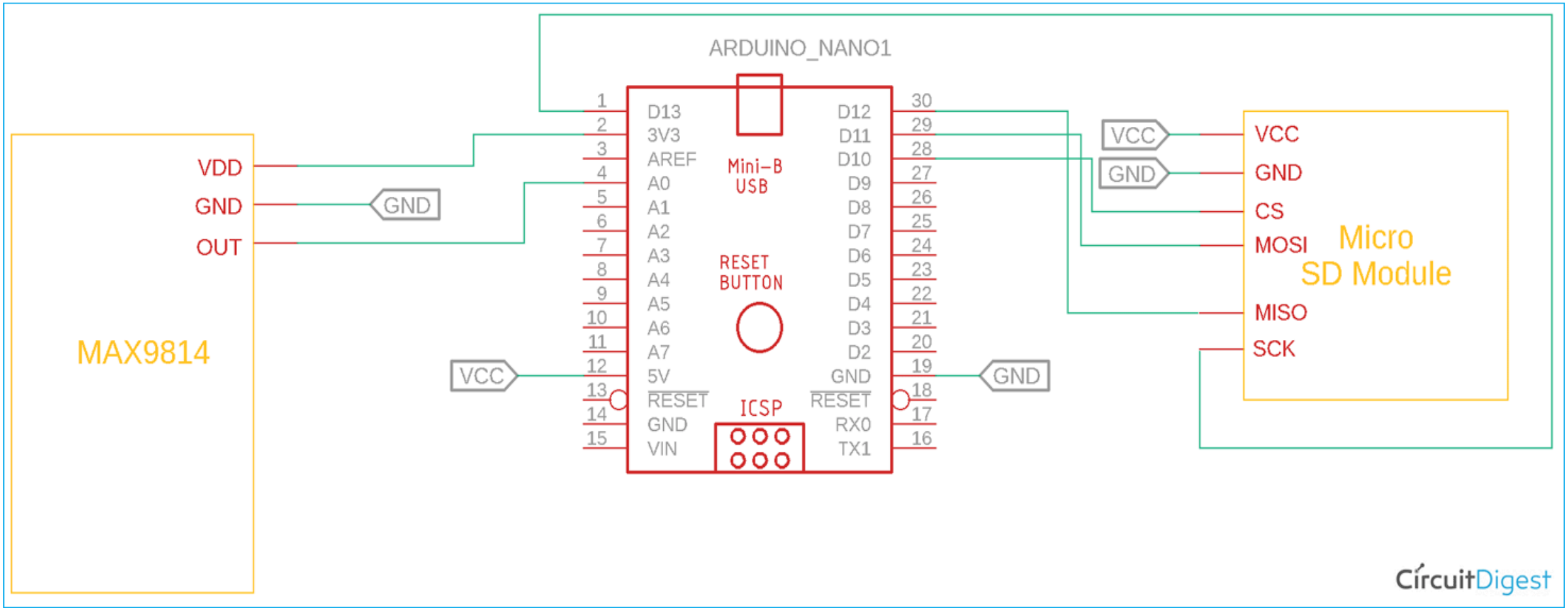
- **VCC** pin provides power to the module and should be connected to the Arduino's 5V pin.
- **GND** is a ground pin.MISO (Master In Slave Out) is the SPI output from the microSD card module.
- **MOSI** (Master Out Slave In) is the SPI input to the microSD card module.
- **SCK** (Serial Clock) pin accepts clock pulses from the master (an Arduino in our case) to synchronize data transmission.
- **SS** (Slave Select) pin is a control pin that is used to select one (or a set) of slave devices on the SPI bus.

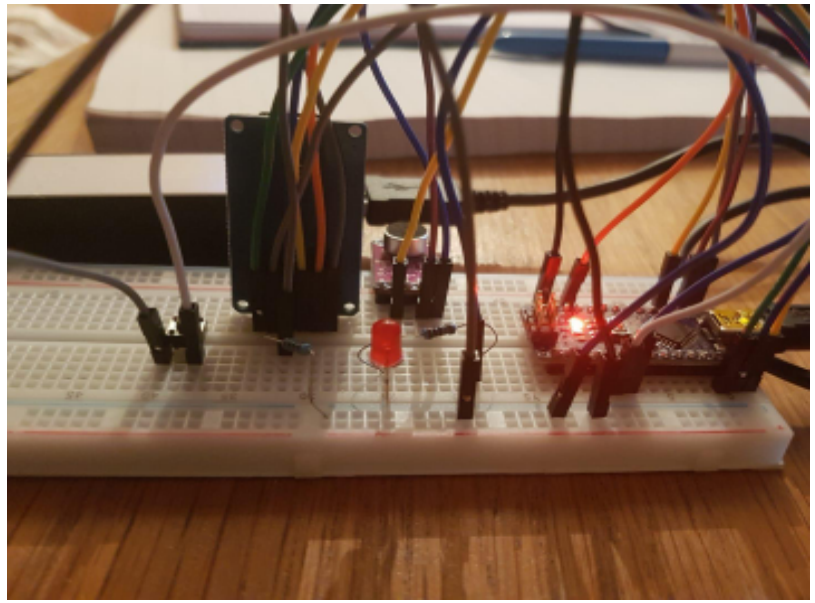
For the MAX9814, Analog pins are used that are listed in the table given below :

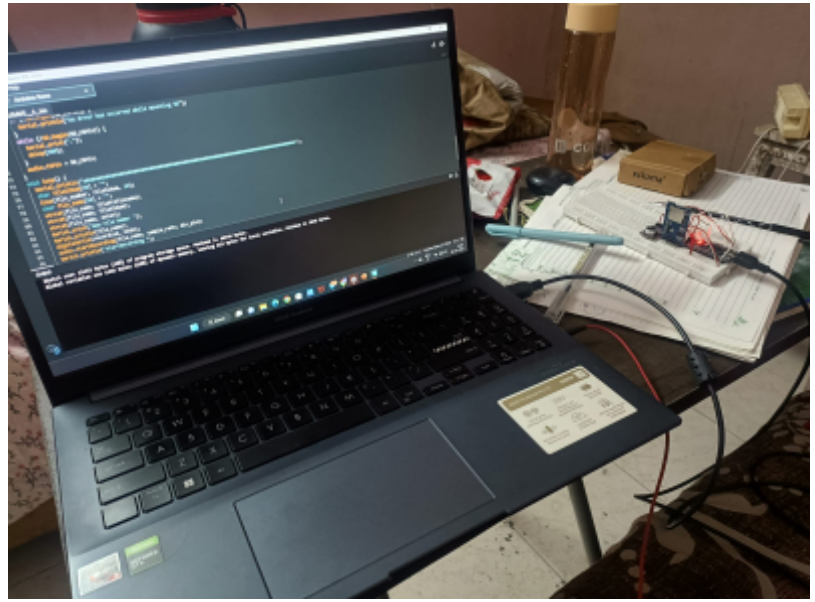
Arduino Pins	MAX9814 Pins
3.3V	VDD
GND	GND
A0	OUT

For the micro SD card, SPI (Serial Parallel Interface) is used. These SPI pins are connected with the following pins :

Arduino Pins	SD Card Pins
5V	VCC
GND	GND
D10	CS
D11	MOSI
D12	MISO
D13	SCK


ARDUINO_NANO1
D13
3V3
AREF
A0
A1
A2
A3
A4
A5
A6
A7
5V
RESET
GND
VIN
D12
D11
D10
D9
D8
D7
D6
D5
D4
D3
D2
GND
RESET
RX0
TX1
Mini-B USB
RESET BUTTON
ICSP
VDD
GND
OUT
MAX9814
GND
VCC
GND
VCC
GND
VCC
GND
CS
MOSI
MISO
SCK
Micro SD Module
CircuitDigest





Problem statement :

Can be used in healthcare

Used to detect sound levels around the surroundings.
Can give an idea of sound levels affecting the person.
Person suffering from hearing aid
Also can be used for personal usage
Recording any content
Audio lectures etc

References and Bibliography

- Audio Surveillance & Voice Record
- Make Your Own Spy Bug (Arduino Voice Recorder) : 5 Steps (with Pictures) – Instructables Books
- . A. Pai Management Institute, Manipal Renewal Due by Dec’19 Email: L.Trikha@elsevier.com
- Sound Systems: Design and Optimization
- Online Voice Recorder - Record Voice from the Microphone (online-voice-recorder.com)