NEW HORIZON COLLEGE OF ENGINEERING

Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC

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ARDUINO BASED TEXT TO SPEECH CONVERTER WITH AMBIENT LIGHT DETECTION USING LDR

A MINI PROJECT REPORT

SUBMITTED BY:

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In partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

ELECTRICAL AND ELECTRONICS

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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New Horizon Knowledge Park, Ring Road, Marathalli
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Bonafide Certificate

This is to Bonafide that the mini project report entitled "Ardiuno Based Text to Speech Converter with ambient light detection using LDR" submitted by **Ramesharaja Ursu K R (1NH19EE407), Ananda M A (1NH18EE702), Mohammed Sufiyan (1NH18EE730)** Department of Electrical and Electronics Engineering, New Horizon College of Engineering, Bangalore in partial fulfilment for the award of the degree of Bachelor of Engineering , is a record of bonafide work carried out by him/her under my supervision, as per the NHCE code of academic and research ethics.

The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university. The project report fulfils the requirements and regulations of the institution and in my opinion meets the necessary standards for submission.

Ms.Deepa V Bolanavar	Dr. Mahesh.M
Guide	HoD

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ABSTRACT

Text-to-speech (TTS) is the synthesis of vocal hues from textual content. The main aim is to make the speech output as clear, characteristic and natural in tune as human a speech. Speech is an essential method for correspondence between individuals. During combination of speech bits, little portions of recorded human speech portions are concatenated together to create the resulting speech output.

The most significant characteristics of a speech combination framework are expectation and understand ability. Expectation depicts how intently the output seems like human speech, while understand ability is the straightforwardness with which the output is comprehended. The perfect speech synthesizer is both intelligible and understandable.
Speech combination frameworks normally attempt to boost the two qualities.

A text to-speech synthesizer permits individuals with visual hindrances and perusing incapacities to listen to written texts away at a home PC. Numerous PC working frameworks have included speech synthesizers since the mid-1990s. Ongoing advancement in speech combination has created synthesizers with extremely high coherence yet the sound quality and naturalness remain to be a significant issue.

KEYWORDS: Text-to speech, Synthesis, concatenation.

INDEX

CHAPTER - 1

INTRODUCTION

Fig. 1 Text to Speech Converter

Language is the capacity to communicate one's ideas by using signs (content), motions, and sounds. It is a unique characteristic native to human beings, who are the only living beings to utilize such a framework. A text-to-speech (TTS) framework synthesises words and sentences to speech output. From the outset sight, this task doesn't look too difficult to even consider performing. After all we as a whole have a great deal of information on phonetic rules of a language. But with regards to TTS synthesis, it is difficult to record and store all the expressions of the language.

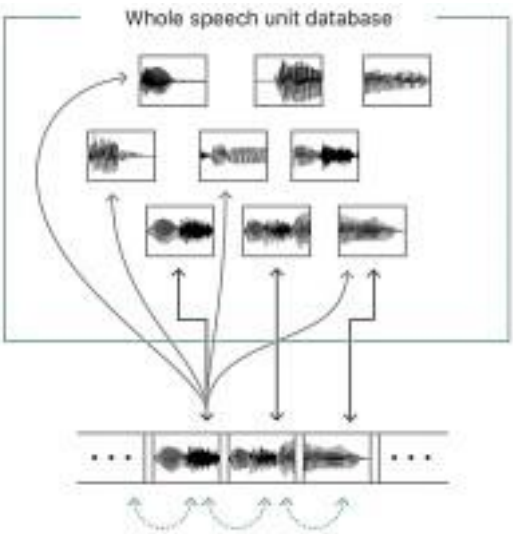

Fig. 2 Concatenation of several chunks of voices

Speech synthesizers that utilize recorded human voices must be preloaded with little pieces of human sound that they can rework. Which means, a developer needs to record bunches of instances of human vocal speech expressing various things and then break the verbally expressed sentences into words and the words into phonemes. In the event that there are sufficient speech tests, the PC can revamp the bits in any number of various approaches to make altogether new words and sentences. This sort of speech blending is called concatenation.

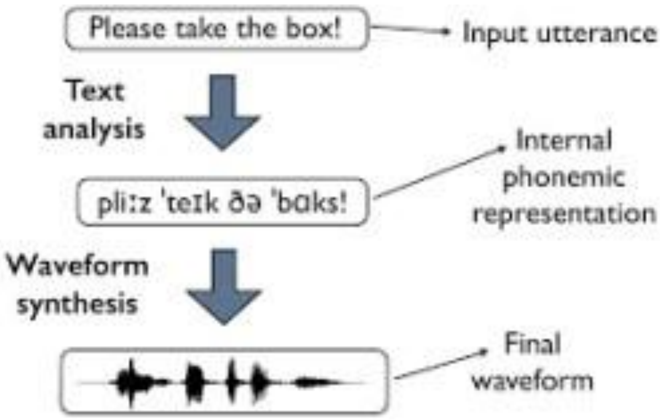

Fig. 3 An overview of Text to Speech Conversion

The first step in TTS is pre-handling or standardization. This process includes the transformation of the images, numbers and contractions into words that can be perused by the machines like '?' will be changed over into "question mark".

The subsequent step includes the transformation of standardized content into phonemes or phonetic transcripts. The phonemes are the little pieces of verbally expressed words for example these are the sounds that make sentences. This progression is extremely fundamental with the goal that machine can express the words as people do.

The last step is synthesis of phonemes into spoken voice. This progression can be accomplished by various techniques like by recording the human voice for various words/phrases or by producing essential sound frequencies and heap them up as phonemes or by replicating a human talking scheme.

In this project we use Arduino to convert text into speech using an additional library called **Talkie.**

CHAPTER - 2

LITERATURE SURVEY

Title	Author & Year of Publication	Outcome	Limitation
Text to Speech Conversion	S. Venkateswaran, D. B. K. Kamesha, J. K. R. Sastri and Radhika Rani, 2016	Presents a cost effective technique that enables the user to listen to the contents of text and images instead of reading.	The method incorporated is complex for making future changes and improvements.
Arduino Based Voice Generator Text to Speech Robot	Hay Man 0,Ni Ni SanHlaing, Thin Thinn Oo, 2019	This paper explains how an based text to speech converter robot works.	It cannot be used in time critical situations.

Text to Speech Conversion System using OCR	Jishai Gopinath, Aravind S, Chandran, Saran S,2015	Outlines method involved in the recognition of text and character and how is it converted into speech signal.	Problem of latency must be taken into consideration.

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CHAPTER - 3

PROPOSED METHODOLOGY

The main objective of this project is to use the underlying concepts of text-to-speech conversion in a use a case scenario. In this project we have made a circuit which speaks '**Good Morning'** or '**Good Evening**' based on the amount of ambient light. This is achieved by using an LDR whose analog output is processed to carry out the above task.

CIRCUIT DIAGRAM

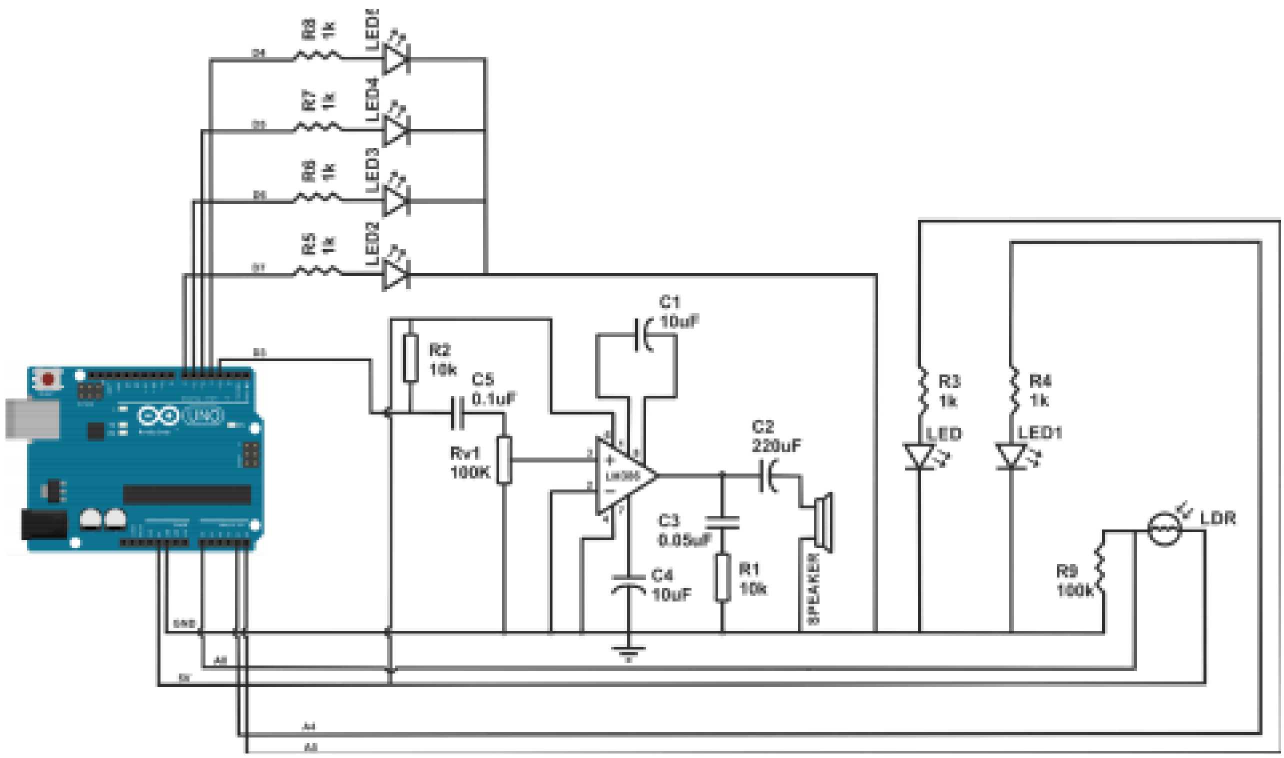


Fig. 4 Circuit diagram for Operational Circuit

WORKING OF THE CIRCUIT

The circuit comprises of an amplifier circuit to lessen the commotion and get a reasonable sound the circuit is made by utilizing the **IC LM386**.

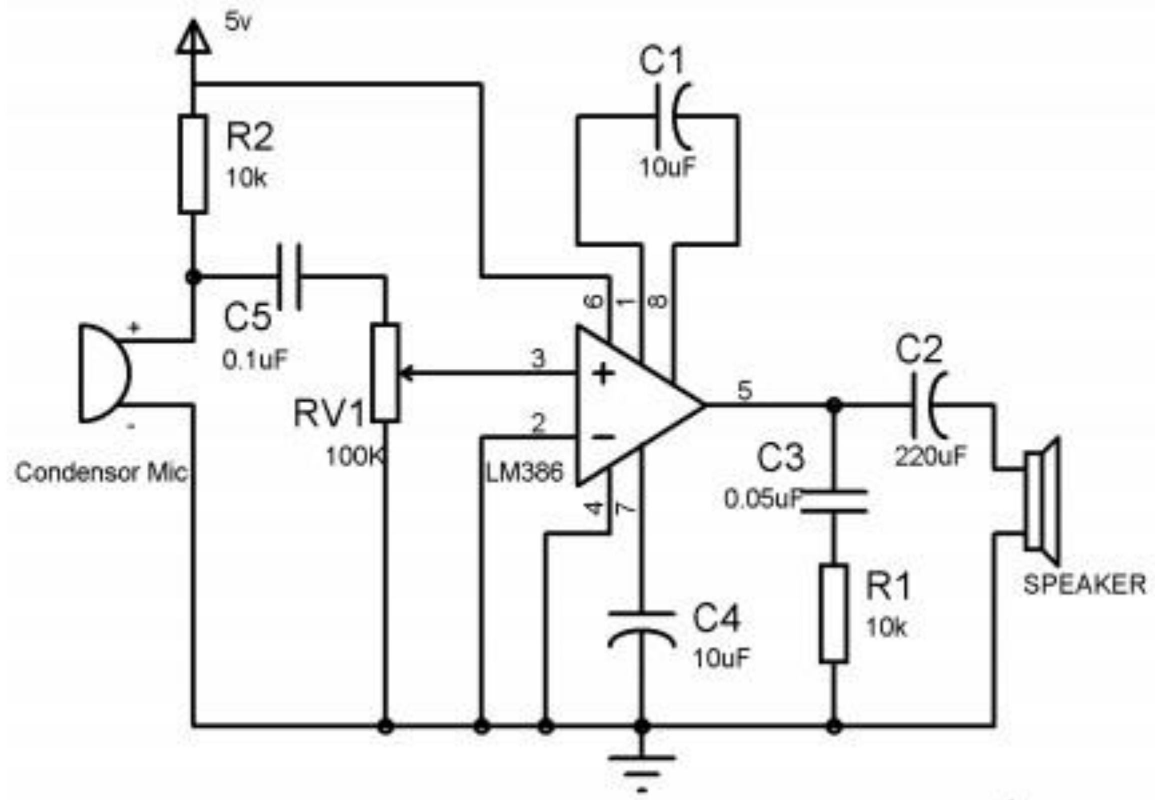


Fig. 5 Amplifier Circuit

LM386 is a low voltage sound amplifier which is utilized in battery fueled music gadgets like radios, guitars, toys and so forth. The gain of the amplifier IC is in the range of 20 to 200, gain is set to 20 without utilizing any additional component. The gain can be expanded to 200 by utilizing resistor and capacitor between PIN 1 and 8, or just with a capacitor. Voltage gain just implies that Voltage OUT is multiple times the Voltage IN.

LM386 has a wide stockpile voltage range of 4-12 V.

Capacitor C1 is utilized to get to get the maximum gain of 200. The gain can be changed in accordance with any incentive between 20 to 200 by utilizing appropriate capacitor.

100k **potentiometer RV1** goes about as volume control handle.

A **capacitor C5** of 0.1uF has additionally been utilized alongside the potentiometer to remove the DC part of information signal and just permit the AC segment to be taken into the IC LM386. The output signal has both AC and DC segments, and the DC segment is not desirable and can't be fed to the Speaker to expel this DC part, a **capacitor C2** of 220uF is utilized. This has a similar functionality as Capacitor C5 (0.1uF) at input side.

Alongside this capacitor, a channel circuit of **Capacitor C3** (0.05uF) and **resistor R1** (10k) has been utilized; this electronic channel is utilized to expel the unexpected High recurrence signals or noise.

Resistor R2 (10k) has been utilized as a Pull up resistor to associate Condenser mic to the positive stock voltage, to power up the mic.

The Arduino is interfaced with the speaker circuit through digital pin 3 as shown in the circuit diagram.

The LDR is associated with the analog pin A0 of the Arduino with its one end associated with ground through a 100k resistor.

The LEDs used in the circuit serve two purposes.

1. To act as an indicator

2. To display the binary equivalent of the numbers spoken

The indicator LEDs namely: LED and LED1 are connected to pins A5 and A4 of the Arduino respectively.

The binary LEDs namely: LED2, LED3, LED4 and LED5 are connected to pins D7, D6, D5 and D4 respectively.

CHAPTER-4

PROJECT DESCRIPTION

BLOCK DIAGRAM

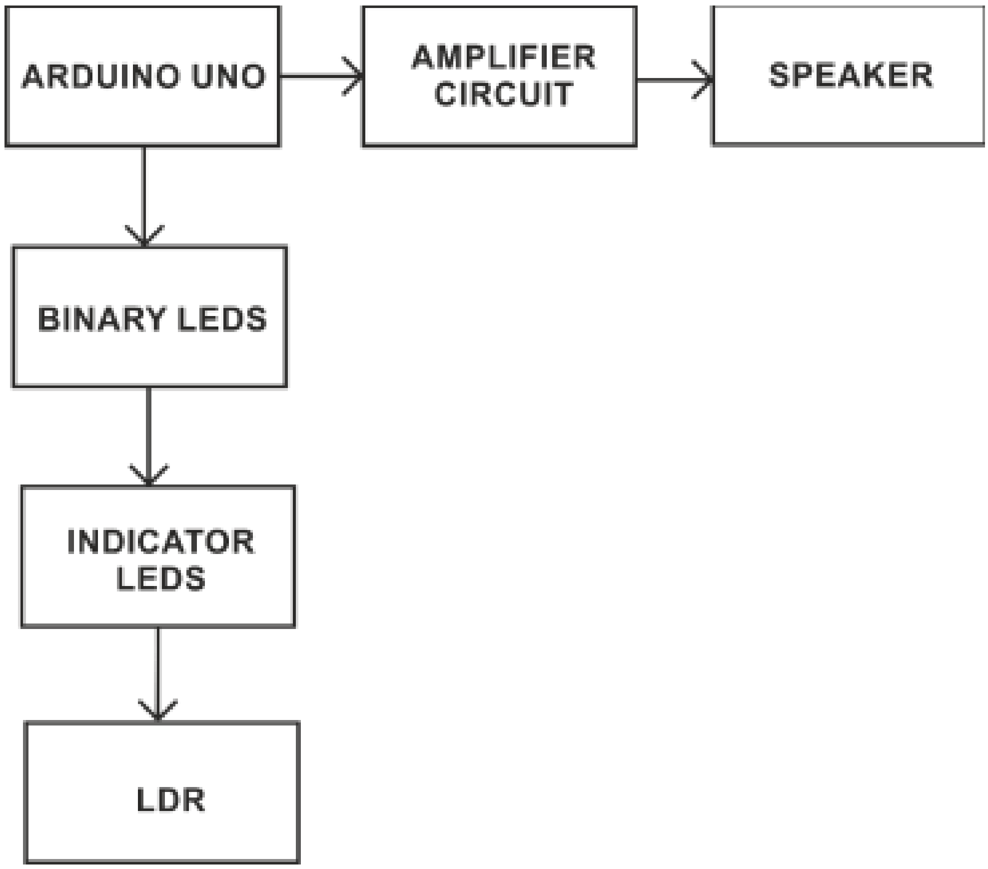


Fig. 6 Block Diagram of Text to Speech Converter

The circuit essentially consists of Arduino **ATMEGA328P**, resistors, LEDs and an LDR module. A platform is provided by means of a PCB board on which the LEDs namely: The Indicator LEDs and Binary LEDs are placed. The Arduino is programmed to speak 'Good Morning' or 'Good Evening' based on the LDR output. The indicator LEDs of Green and Red turn ON when 'Good Morning' and 'Good Evening' is spoken respectively. The Binary LEDs display the corresponding binary equivalent of the numbers being spoken by the Arduino.

CHAPTER- 4.1

HARDWARE DESCRIPTION

In this area we will underline on a top to bottom audit of all of the components shown in above circuit diagram. In description individual schematics and working of the components are explained.

1. Arduino ATMEGA 328P

Fig. 7 Arduino UNO ATMEGA328P

The Arduino Uno is a microcontroller board on a very basic level reliant on the **ATMEGA328**. It has 14 digital I/O pins (of which 6 can be used as PWM outputs), 6 simple information pins, a sixteen MHz crystal oscillator, a USB connector, a power jack, an ICSP header, and a reset switch. It houses everything required to help the microcontroller; fundamentally, to interface to a PC with a USB connector. The Uno contrasts from each and every past board in that it never again uses the FTDI USB-to-sequential driver chip. Or maybe, it has the Atmega8U2 altered as a USB-to-sequential converter.

Memory

The **ATMEGA328** has 32 KB of glimmer stockpiling for storing the code (of which 0,5 KB is utilized for the boot loader); It furthermore has 2 KB of SRAM and 1 KB of EEPROM.

Input and Output pins

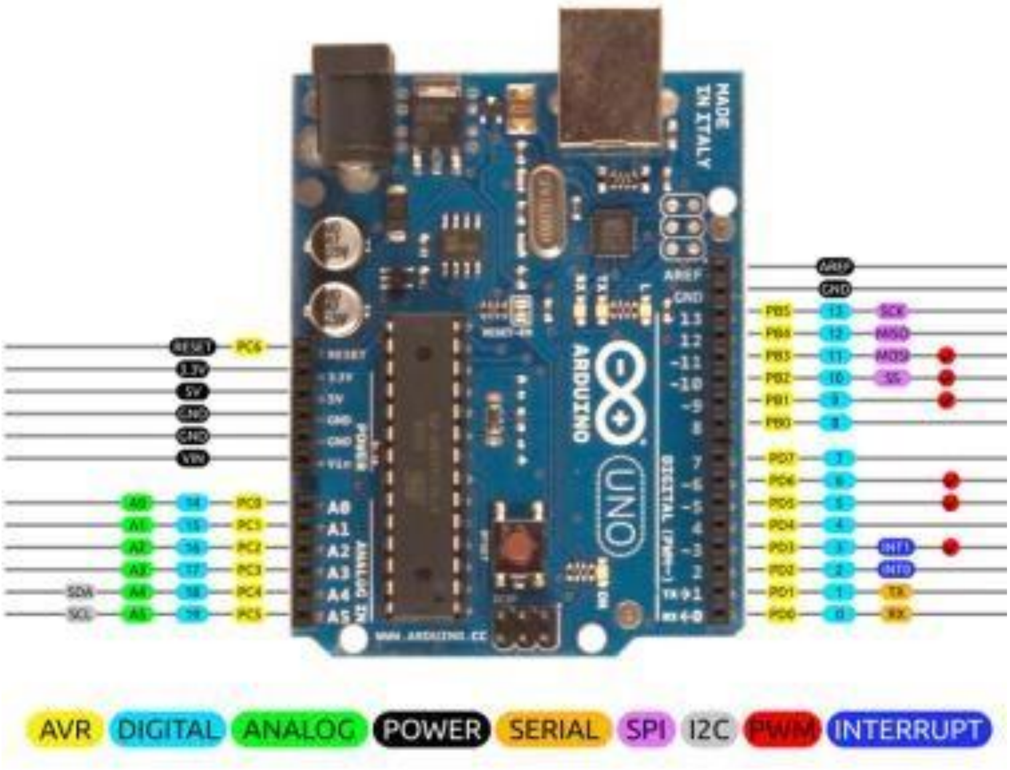


Fig. 8 Pin configuration of Arduino UNO

All of the 14 digital pins on the Uno can be used as an analog input or output pins, using pin Mode (), digital Write (), and digital Read () capacities. They work at 5 volts. Each stick can supply or increase to a cut off of 40 mA and has an inward draw up resistor of 20-50 k Ohms. In like manner, a couple of pins have explicit functionality:

- Sequential: zero (RX) and 1 (TX) are used to get (RX) and transmit (TX) TTL sequential data. These pins are related with the contrasting pins of the ATmega8U2 USB-with TTL sequential chip.
- Interrupt pins: 2 and 3 these pins can be organized to set an interrupt for a low input based on the rising or falling edge.
- PWM: 3, 5, 6, 9, 10, and eleven offer 8-bit PWM result with the analogWrite () operation.
- SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins help SPI correspondence, which, in spite of being supported by the existing hardware, it isn't fused into the Arduino language.

- LED: 13. There is an on-board LED related with pin D13. When the digital pin is

given HIGH, the LED is on, when the pin is LOW the LED turns off. The Uno has 6 simple information inputs, all of which supply 10 bits of information (for instance 1024 exceptional qualities). As is normally done, they measure from ground to 5 volts, despite the way that is it pragmatic to change the upper end of their range using the AREF.

Communication

The Arduino Uno has a wide collection of interfacing ways for interfacing with a PC, another Arduino, or diverse microcontrollers. The ATMEGA328 offers UART TTL (5V) sequential correspondence, which is operational on D0 pin(RX) and D1 pin (TX). An ATMEGA8U2 on the board channels this sequential information over USB and shows up as a virtual correspondence port on the PC. The Arduino programming framework fuses a successive screen which lets in basic abstract information to be despatched to and from the Arduino board. The RX and TX LEDs on the board will blink when information is being transmitted by the USB-to sequential chip.

USB over current protection

The Arduino Uno has a resettable polyfuse that shields the computer's USB ports from shorts and over current. Albeit most PC structures give their own inherent protection, the circuit offers an increasingly conspicuous layer of protection. If more than 500 mA is applied to the USB port, the wire will have its association removed till the short or over Load has subsided.

Physical Attributes

The size and width of the Uno PCB are 2.7 and 2.1 inches independently, with the USB connector and power jack. Three screw holes engage the board to be held with a surface or case.

Table 1. Specifications of Arduino Board

Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 Ma
DC Current for 3.3V Pin	50mA
Flash Memory	32 KB of which 0.5KB
SRAM	2 KB
EEPROM	1 KB
Clock Speed	16 MHz
Length	68.6 mm
Weight	25g

Table. 1 Technical Specification of Arduino Uno ATmega328

2. LM 386

The LM386 are power amplifiers intended for use in low voltage applications. The gain is initially set to 20, yet with the use of an additional resistor and capacitor between pins 1 and 8 the gain can be increased from 20 to 200. The data inputs are ground referenced while the output consequently inclines to a large portion of the stock voltage. The tranquil force channel is just 24mW working with a 6-V supply, making the LM386 perfect for battery used operations.

Pin Configuration and Functions

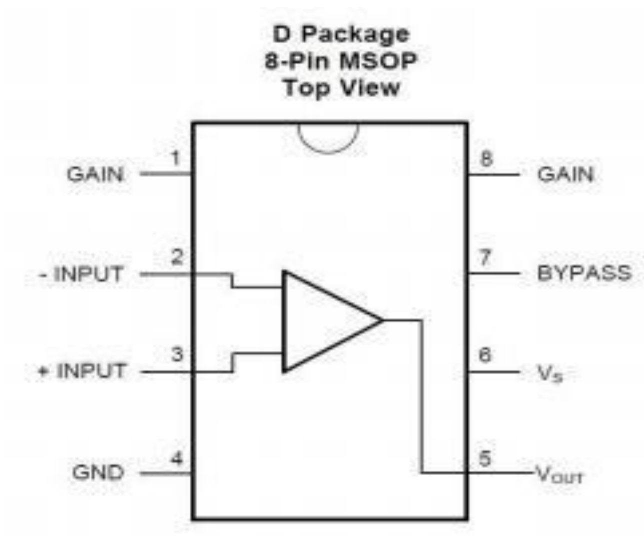


Fig. 9 Pin configuration of IC LM 386

Pin Number	Pin Name	Function
1	Gain	Gain Setting Pin
2	- Input	Inverting Input
3	+ Input	Non-Inverting Input
4	GND	Ground
5	Vout	Output
6	Vs	Power Supply
7	Bypass	Bypass Decoupling Pin
8	Gain	Gain Setting Pin

Table. 2 Pin functions of LM 386

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_S	Operating Supply Voltage	LM386N-1, -3, LM386M-1, LM386MM-1	4		12	V
		LM386N-4	5		18	
I_Q	Quiescent Current	V_S = 6 V, V_{IN} = 0		4	8	mA
P_{OUT}	Output Power	V_S = 6 V, R_L = 8 Ω, THD = 10% (LM386N-1, LM386M-1, LM386MM-1)	250	325		mW
		V_S = 9 V, R_L = 8 Ω, THD = 10% (LM386N-3)	500	700		
		V_S = 16 V, R_L = 32 Ω, THD = 10% (LM386N-4)	700	100		
A_V	Voltage Gain	V_S = 6 V, f = 1 kHz		26		dB
		10 μF from Pin 1 to 8		46		
BW	Bandwidth	V_S = 6 V, Pins 1 and 8 Open		300		kHz
THD	Total Harmonic Distortion	V_S = 6 V, R_L = 8 Ω, POUT = 125 mW f = 1 kHz, Pins 1 and 8 Open		0.2%		
PSRR	Power Supply Rejection Ratio	V_S = 6 V, f = 1 kHz, CBYPASS = 10 μF Pins 1 and 8 Open, Referred to Output		50		dB
R_{IN}	Input Resistance			50		kΩ
I_{BIAS}	Input Bias Current	V_S = 6 V, Pins 2 and 3 Open		250		nA

Table. 3 Electrical Characteristics of IC LM 386

3. LDR

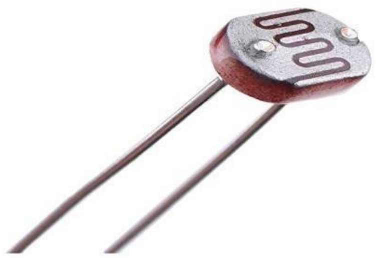


Fig. 10 LDR

A Light Dependent Resistor (otherwise called a photo resistor or LDR) is a gadget whose resistivity is a function of the incident electromagnetic radiation. Thus, they are light delicate gadgets. They are even called as photoconductors, photoconductive cells or basically photocells. They are comprised of semiconductor materials that have high obstruction.

The working of photo resistors dependent on the standard of photoconductivity. Photoconductivity is an optical happening where the material's conductivity is expanded when light is consumed by the material.

At the point when light falls on the gadget, the electrons in the valence band of the semiconductor material are eager to move to the conduction band. These photons in the event of light falling more prominent vitality than the band gap of the semiconductor material to make the electrons bounce from the valence band to the conduction band.

Consequently, when light having enough vitality strikes on the gadget, an ever-increasing number of electrons are eager to move to the conduction band which brings about an enormous number of charge transporters. The after-effect of this procedure is an ever increasing presence of current coursing through the gadget when the circuit is turned off and consequently it is said that the resistance of the gadget has been diminished. This is the most widely recognized working rule of LDR.

Characteristics of Photo resistor (LDR)

Photo resistor LDR's are light-reliant gadgets whose resistance is diminished when light falls on them and that is expanded in obscurity. At the point when a light dependent resistor is kept in dim, its resistance is exceptionally high. This opposition is called as dim obstruction. It tends to be as high as 1012 Ω and if the gadget is permitted to ingest light its resistance will be diminished radically. In the event that a consistent voltage is applied to it and the intensity of light is expanded the current also increased along with it. The figure underneath shows the resistance versus lumination graph for a specific LDR.

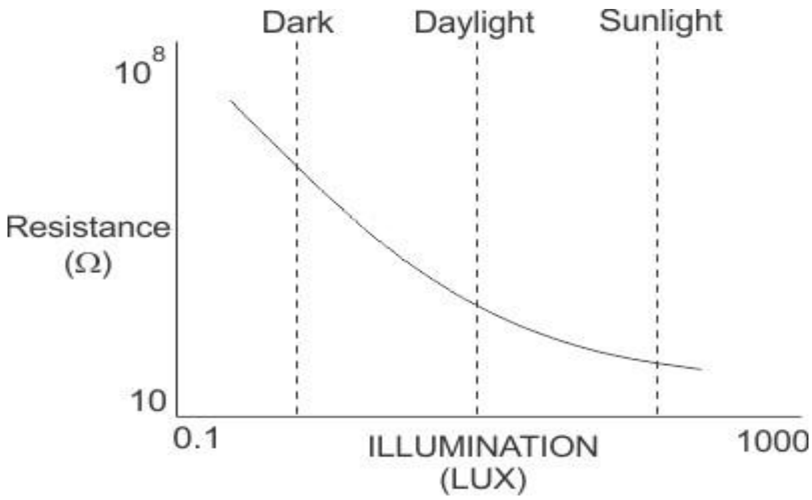


Fig. 11 Resistance V/S illumination curve

4. Resistors

Fig. 12 Typical 4 band resistors

The resistor is an inert electrical device to make obstruct the flow of current. Taking into account the application, the electrical manufacturer chooses various properties of the resistor. The basic function is to restrain the electrical stream; as such, the key parameter is the estimation of resistance. The exactness of this characteristic is shown with the versatility of the resistor described in its rating.

Different parameters that affect the resistance can be analyzed. This includes the dependency of the resistance on the temperature coefficient and other environmental changes.

Driven lights need a particular current to work. A too low current won't light up the LED, while a too high current may pulverize the gadget. In this manner, they are often put in arrangement with resistors to ensure their normal functioning. These are called balance resistors and inactively direct the current in the circuit.

www.resistorguide.com

	Color	Signficant figures			Multiply	Tolerance (%)	Temp. Coeff. (ppm/K)	Fail Rate (%)
Bad	black	0	0	0	x 1		250 (U)	
Beer	brown	1	1	1	x 10	1 (F)	100 (S)	1
Rots	red	2	2	2	x 100	2 (G)	50 (R)	0.1
Our	orange	3	3	3	x 1K		15 (P)	0.01
Young	yellow	4	4	4	x 10K		25 (Q)	0.001
Guts	green	5	5	5	x 100K	0.5 (D)	20 (Z)	
But	blue	6	6	6	x 1M	0.25 (C)	10 (Z)	
Vodka	violet	7	7	7	x 10M	0.1 (B)	5 (M)	
Goes	grey	8	8	8	x 100M	0.05 (A)	1(K)	
Well	white	9	9	9	x 1G			
Get	gold			3th digit only for 5 and 6 bands	x 0.1	5 (J)		
Some	silver				x 0.01	10 (K)		
Now!	none					20 (M)		

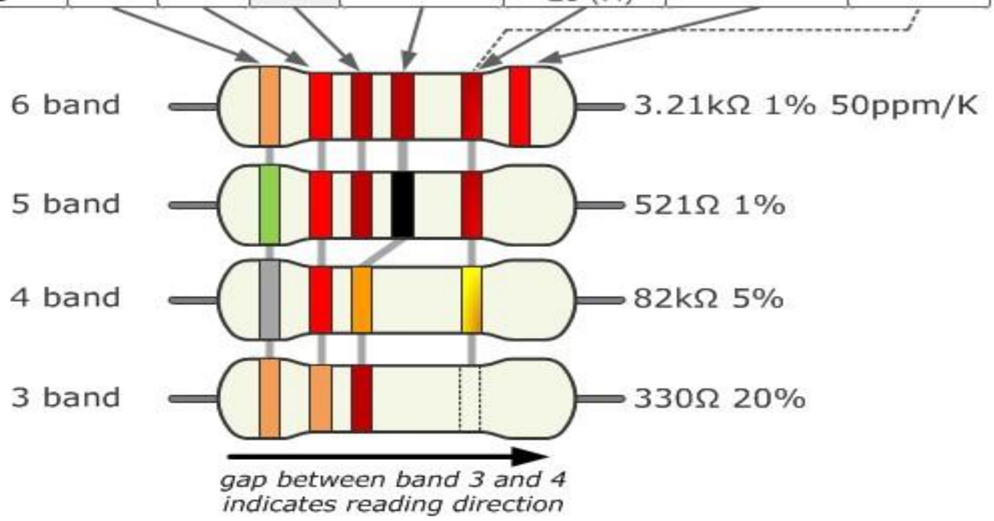


Fig. 13 Resistor Specification

5. LEDs

Fig. 14 LEDs

The color of the LED, that is the wavelength of emanation from the LED is depends upon the material used for the LED and moreover by the chip fabricate process. Assortments of methodology can tailor the best wavelength varieties up to scopes of around ±10nm.

	Color	Wavelength [nm]	Semiconductor material
	Infrared	$\lambda > 760$	Gallium arsenide (GaAs) Aluminium gallium arsenide (AlGaAs)
	Red	$610 < \lambda < 760$	Aluminium gallium arsenide (AlGaAs) Gallium arsenide phosphide (GaAsP) Aluminium gallium indium phosphide (AlGaInP) Gallium(III) phosphide (GaP)
	Orange	$590 < \lambda < 610$	Gallium arsenide phosphide (GaAsP) Aluminium gallium indium phosphide (AlGaInP) Gallium(III) phosphide (GaP)
	Yellow	$570 < \lambda < 590$	Gallium arsenide phosphide (GaAsP) Aluminium gallium indium phosphide (AlGaInP) Gallium(III) phosphide (GaP)
	Green	$500 < \lambda < 570$	**Traditional green:** Gallium(III) phosphide (GaP) Aluminium gallium indium phosphide (AlGaInP) Aluminium gallium phosphide (AlGaP) **Pure green:** Indium gallium nitride (InGaN) / Gallium(III) nitride (GaN)
	Blue	$450 < \lambda < 500$	Zinc selenide (ZnSe) Indium gallium nitride (InGaN) Silicon carbide (SiC) as substrate Silicon (Si) as substrate—under development
	Violet	$400 < \lambda < 450$	Indium gallium nitride (InGaN)
	Purple	multiple types	Dual blue/red LEDs, blue with red phosphor, or white with purple plastic
	Ultraviolet	$\lambda < 400$	Diamond (235 nm) Boron nitride (215 nm) Aluminium nitride (AlN) (210 nm) Aluminium gallium nitride (AlGaN) Aluminium gallium indium nitride (AlGaInN)—down to 210 nm
	Pink	multiple types	Blue with one or two phosphor layers: yellow with red, orange or pink phosphor added afterwards, or white with pink pigment or dye.
	White	Broad spectrum	Blue/UV diode with yellow phosphor

Table. 4 LED specification

LED current / voltage specification

LEDs are current driven devices and the degree of light released is dependent on the current that is provided. It is crucial to affirm that the threshold current rating isn't exceeded. This would a better heat dispersal of the LED chip which then could perform to its full potential during its entire lifetime.

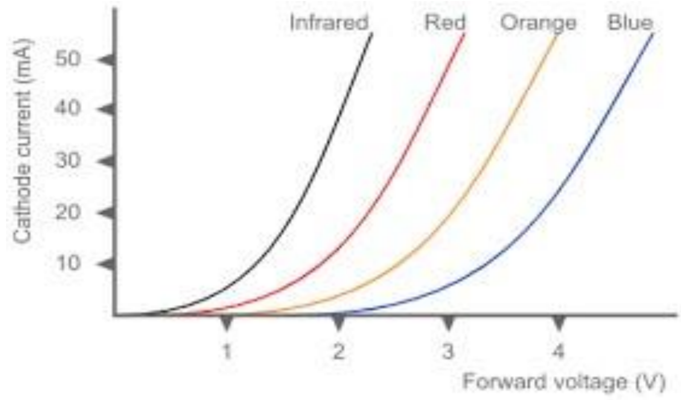


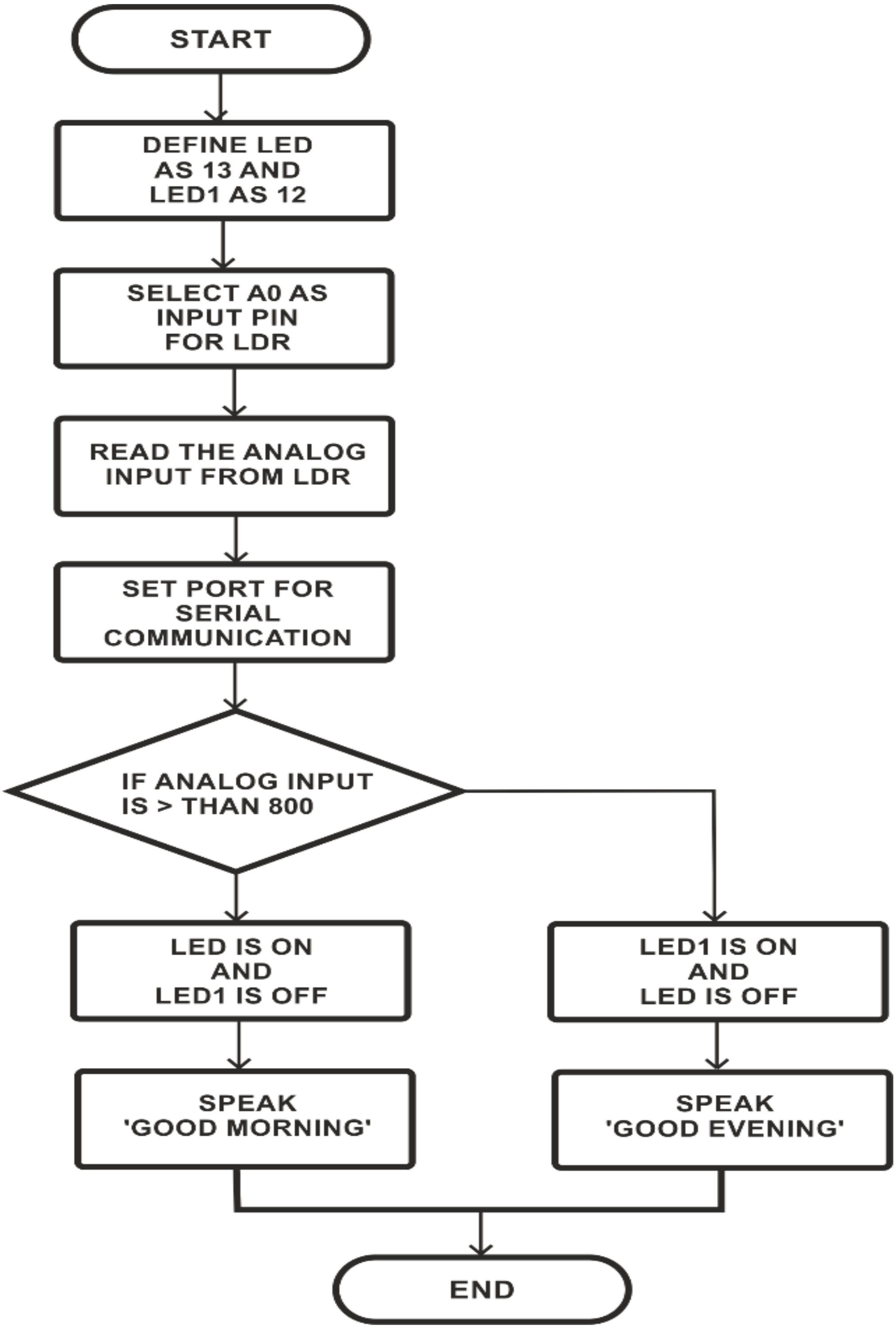
Fig. 15 Typical approximate LED voltage curves

In working, LEDs will have a given voltage drop transversely over them which is dependent upon the material used.

CHAPTER-4.2

SOFTWARE DESCRIPTION

I. Flow Chart



II. Program

```
#include "Talkie.h"

#include "Vocab_US_Large.h"

#include "Vocab_Special.h"

#include "Vocab_US_TI99.h"

#include "Vocab_US_Clock.h"


Talkie voice;


#define LED A5 //connect LED to digital pin A5

#define LED1 A4 //connect LED to digital pin A4


#define LED2 4 // LED 1

#define LED3 5 // LED 2

#define LED4 6 // LED 3

#define LED5 7 // LED 4


int sensorPin = A0; // select the input pin for LDR  int sensorValue

= 0; // variable to store the value coming from the


sensor void setup() {
```

```
Serial.begin(9600); //sets serial port for communication pinMode(LED, OUTPUT);

pinMode(LED1, OUTPUT);  PinMode(LED2, OUTPUT);  pinMode(LED3, OUTPUT);

pinMode(LED4, OUTPUT);  pinMode(LED5, OUTPUT);

//USN

{voice.say(sp3_SEVEN);

{digitalWrite(LED2, HIGH); // LED 1 FOR 7

digitalWrite(LED3, HIGH); // LED 2

digitalWrite(LED4, HIGH); // LED 3

digitalWrite(LED5, LOW); // LED 4

}

}

{voice.say (sp3_ZERO);

{digitalWrite(LED2, LOW); // LED 1 FOR 0

digitalWrite(LED3, LOW); // LED 2

digitalWrite(LED4, LOW); // LED 3

digitalWrite(LED5, LOW); // LED 4

}

}



{voice.say (sp3_THREE);
```

```
{digitalWrite(LED2, HIGH); // LED 1 FOR 3

digitalWrite(LED3, HIGH); // LED 2

digitalWrite(LED4, LOW); // LED 3

digitalWrite(LED5, LOW); // LED 4 }

}

voice.say(spPAUSE2);

voice.say(spPAUSE2);

voice.say(spPAUSE2);

{voice.say(sp3_SEVEN);

{


digitalWrite (LED2, HIGH); // LED 1 FOR 7

digitalWrite (LED3, HIGH); // LED 2

digitalWrite(LED4, HIGH); // LED 3

digitalWrite(LED5, LOW); // LED 4 }

}

{voice.say (sp3_ZERO);

{digitalWrite(LED2, LOW); // LED 1 FOR 0

digitalWrite(LED3, LOW); // LED 2

digitalWrite(LED4, LOW); // LED 3

digitalWrite(LED5, LOW); // LED 4

                                                                }
```

```
}

{voice.say (sp3_ONE);

{digitalWrite(LED2, HIGH); // LED 1 FOR 1

digitalWrite(LED3, LOW); // LED 2

digitalWrite(LED4, LOW); // LED 3

digitalWrite(LED5, LOW); // LED 4 }

}

voice.say(spPAUSE2);

voice.say(spPAUSE2);

voice.say(spPAUSE2);

{voice.say(sp3_SEVEN);

{digitalWrite(LED2, HIGH); // LED 1 FOR 7

digitalWrite(LED3, HIGH); // LED 2

digitalWrite(LED4, HIGH); // LED 3

digitalWrite(LED5, LOW); // LED 4 }

}

{voice.say (sp3_ZERO);

{digitalWrite(LED2, LOW); // LED 1 FOR

0 digitalWrite(LED3, LOW); // LED 2



digitalWrite(LED4, LOW); // LED
```

```
3 digitalWrite(LED5, LOW); //

LED 4 }

}


{voice.say(sp3_SEVEN);

{digitalWrite(LED2, HIGH); // LED 1 FOR 7

digitalWrite(LED3, HIGH); // LED 2

digitalWrite(LED4, HIGH); // LED 3

digitalWrite(LED5, LOW); // LED 4 }

}

voice.say(spPAUSE2);

voice.say(spPAUSE2);

voice.say(spPAUSE2);

{voice.say(sp3_SEVEN);

{digitalWrite(LED2, HIGH); // LED 1 FOR 7

digitalWrite(LED3, HIGH); // LED 2

digitalWrite(LED4, HIGH); // LED 3

digitalWrite(LED5, LOW); // LED 4 }

}


{voice.say (sp3_ONE);
```

```
{digitalWrite(LED2, HIGH); // LED 1 FOR 1

digitalWrite(LED3, LOW); // LED 2

digitalWrite(LED4, LOW); // LED 3

digitalWrite(LED5, LOW); // LED 4


}

}

{voice.say (sp3_THREE);

{digitalWrite(LED2, HIGH); // LED 1 FOR 3

digitalWrite(LED3, HIGH); // LED 2

digitalWrite(LED4, LOW); // LED 3

digitalWrite(LED5, LOW); // LED 4

}

}

}

void loop() {  sensorValue =

analogRead(sensorPin);  if(sensorValue >

800) //setting a threshold value {

digitalWrite(LED, HIGH);

digitalWrite(LED1, LOW);
```

```
voice.say(spPAUSE2)

;

voice.say(spPAUSE2)

;

voice.say(spPAUSE2)

;


voice.say(spc_GOOD); voice.say(spc_MORNING)

; voice.say(spPAUSE2); }  else

{

digitalWrite(LED, LOW);

digitalWrite(LED1, HIGH);


     voice.say(spPAUSE2);

     voice.say(spPAUSE2);

     voice.say(spPAUSE2);

     voice.say(spPAUSE2);

     voice.say(spc_GOOD)

;

voice.say(spc_EVENING)

; }

}
```

Explanation

The code which is a combination of C and C++ is written and compiled in the Arduino IDE software. The program begins with the inclusion of the talkie library which houses the voice commands used in the program. The other libraries are included as they are necessary to use the ‘number’ voice commands used to speak out the USN numbers.

The LEDs are assigned with their respective pin numbers and named accordingly. The LDR is assigned to analog pin A0 using the variable ‘sensorPin’.

In the setup block the modes of the pin to which the LEDs and Arduino are connected are specified and the serial communication baud rate is set to 9600. It is in this section that the Binary LEDs are programmed to display the binary equivalent of the USN numbers being spoken.

In the loop block the functional code to take the LDR input and speak the phrases of ‘Good

Morning’ and ‘Good Evening’ are written. The LDR input is taken into a variable ‘sensorValue’. If the sensorValue becomes greater than 800(The value obtained from the serial communication window) the Arduino speaks ‘Good Morning’ and if the condition is false it speaks ‘Good Evening’.

CHAPTER-5

RESULT AND DISCUSSION

The design which is proposed to work as a Text to Speech converter is actualized with features as mentioned in the above sections. The advantage of the circuit is that is can be implemented along with other devices with very less modification. The circuit can be changed to suit any necessary application. The device is planned and realized successfully and it is ready to be utilized.

The circuit can be used in the following scenarios

1. It can used to guide blind and disabled people with the voice output of the surrounding condition.

2. It can used in speaking clocks with the additional feature being the ability to detect the ambient light so that alarms can be more adaptive.

3. It can used in solar powered vehicles where the charging of the battery can be set according to the intensity of the sun light with vocal feedback given to the user.

CHAPTER-6

CONCLUSION AND FUTURE SCOPE

The circuit was designed to function as an ambient light detecting circuit with speech capability. The practical use case of the circuit is many. The entire circuit is built keeping in mind the how power efficient can it be made. The circuit can be made more robust by adding more additional features and efficient coding.

The working of the circuit can be further improvised by adopting the following points.

1. More natural and human like voice can be implanted with close similarity to human speech nuances.

2. The program can be written to speak any given text with less hiccups in between the words.

3. The entire circuit can be implemented using android application for better device interface

CHAPTER-7

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THANK YOU