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Modern College of Engineering, Shivajinagar, Pune-05

Department of Electronics and Telecommunication

T. E. Mini Project Log Book

Academic Year: 2021-22

Project ID:- A13

Name of Student: -

1.Omkar Ankush Kashid

2.Madhuri Navnath Mahale

3.Shilpa Ratan Sanap

Name of the Guide:-Prof. Ramgopal Sahu

Project Title: - Scrolling Display Using Neopixel LED Matrix

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Modern College of Engineering, Shivajinagar, Pune-05.

Department of Electronics and Telecommunication

QUALITY POLICY OF THE INSTITUTE

We, PES Modern College of Engineering are committed to develop and foster cultured and promising professionals by imparting quality education in the field of Engineering and Management.

VISION OF THE INSTITUTE

To create a collaborative academic environment to foster professional excellence and ethical values

MISSION OF THE INSTITUTE

1. **To develop outstanding engineers & professionals with high ethical standards capable of creating and managing global ent erprises.**
2. **To foster innovation and research by providing a stimulating learning environment.**
   To ensure equitable development of students of all ability levels and 3. backgrounds.
4. **To be responsive to changes in technology, socio -economic levels and environmental conditions.**
5. **To foster and maintain mutually beneficial partnerships with alumni and industry.**

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Department of Electronics and Telecommunication

DEPARTMENTAL QUALITY POLICY

We at Department of Electronics and Telecommunication Engineering are committed to provide a comprehensive learning environment for all round development of our students.

DEPARTMENTAL VISION

To impart holistic Education in Electronics and Telecommunication Engineering to create engineers equipped to meet the challenges of a dynamic, global environment.

DEPARTMENTAL MISSION

1. **To impart quality Education in the field of Electronics, Communication and Signal processing, by providing a comprehensive learning experience.**
2. **To provide avenues to encourage students to continue education in diverse fields.**
3. **To develop competent Engineers, well-versed in multi-disciplinary fields.**
4. **To inculcate ethical and professional values in our students to endow society with responsible citizens.**

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PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Department of Electronics and Telecommunication

PROGRAM EDUCATIONAL OBJECTIVES

The Electronics and Telecommunication Engineering Department of P.E.S's MCOE will develop graduates who,

1. **having diverse skills, will be able to pursue careers as Entrepreneurs, Engineers or Managers in Private or Government Sectors.**
2. **can continue their Education in the same field or diversify to Multi-disciplinary fields to emerge as Managers, Researchers or Teachers.**
3. **will continue their learning experience to be able to flourish and contribute to meet future challenges.**
4. **will practice Ethical standards keeping in mind their social responsibilities and be able to lead teams of professionals around the World.**

PROGRAM SPECIFIC OUTCOMES

At the time of graduation, the students of the ENTC department of PES's MCOE, will be able to

1. the electronics, communication, embedded or information systems or subApply the Knowledge in E&TC engineering to understand, evaluate, design, or implement -systems using conventional or modern tools/techniques
2. Take up jobs in Government or private sectors, undertake research, create jobs, or pursue further studies in any of the fields of E & TC, in India or Abroad.
3. Incorporate ethical & social responsibility to complete projects in the E & TC and allied fields and use effective written and oral communication skills to present work done.

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Mini Project (304200)

Weekly Work Load(in Hrs)	Lecture	Tutorial	Practical
	-	-	4

Online/ In-Sem	Theory	Practical	Oral	Term-work	Total Marks	Credits-2	
-	-	-	50	25	50	TH-NA	PR-2

Syllabus

A. Execution of Mini Project

- Project group shall consist of not more than 3 students per group.
- Mini Project Work should be carried out in the Design / Projects Laboratory.
- Project designs ideas can be necessarily adapted from recent issues of electronic design magazines Application notes from well-known device manufacturers may also be referred.
- Use of Hardware devices/components is mandatory.
- Layout versus schematic verification is mandatory.
- Bare board test report shall be generated.
- Assembly of components and enclosure design is mandatory.

B: Selection: Domains for projects may be from the following, but not limited to:

•Instrumentation and Control Systems

•Electronic Communication Systems

•Biomedical Electronics

•Power Electronics

•Audio, Video Systems

•Embedded Systems

•Mechatronic Systems

•Microcontroller based projects should preferably use Microchip PIC controllers / ATmega controller / AVR microcontrollers / Arduino / Raspberry Pi.

C. Monitoring: (for students and teachers both)

Suggested Plan for various activities to be monitored by the teacher.

Week 1 & 2: Formation of groups, Finalization of Mini project & Distribution of work.
Week 3 & 4: PCB artwork design using an appropriate EDA tool, Simulation.
Week 5 to8: PCB manufacturing through vendor/at lab, Hardware assembly, programming (if required) Testing, Enclosure Design, Fabrication etc
Week 9 & 10: Testing of final product, Preparation, Checking & Correcting of the Draft Copy of Report
Week 11 & 12: Demonstration and Group presentations.

Log book for all these activities shall be maintained and shall be produced at the time of examination.

D. Report writing

•A project report with following contents shall be prepared:

- Title
- Specifications
- Block diagram
- Circuit diagram
- Selection of components, calculations
- Simulation results
- PCB artwork
- Testing procedures
- Enclosure design
- Test results
- Conclusion
- References

Course Objectives:

- **To plan** for various activities of the project and distribute the work amongst team members.
- **To inculcate** electronic hardware implementation skills by, learning PCB artwork design using an appropriate EDA tool, imbibing good soldering and effective trouble-shooting practices.
- **To elaborate** the importance of document design by compiling Technical Report on the Mini Project work carried out.
- **To develop** student‘s abilities to transmit technical information clearly through delivery of Seminar based on the Mini Project.

Course Outcomes:

On completion of the course, students will be able to

CO1. Identify a need based project to be executed as a team with systematic planning.
CO2. Develop mini project (product) with PCB artwork design, soldering techniques, trouble shooting and necessary software tools. (BTL- 6)
CO3. Prepare a technical report based on the Mini project. (BTL- 3)
CO4. Deliver technical seminar based on the Mini Project work carried out. (BTL- 3)

CO – PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	3	-	2	-
CO2	-	-	3	-	3	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	2
CO4	-	-	-	-	-	-	-	-	3	-	3	2
CO*	**-**	**-**	**3**	**-**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**2**

CO – PSO Mapping

CO	PSO 1	PSO 2	PSO 3
CO1	2	2	3
CO2	3	3	3
CO3	-	1	3
CO4	-	1	3
CO*	**3**	**2**	**3**

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Guidelines about Log Book

1. The project log book should be handled carefully.
2. Students must enter the correct information in the mini project log book.
3. All the entries in the mini project log book should be verified by the guide.
4. Activity planned should be completed as per schedule.
5. Submit soft and hard copies of synopsis, project report as per schedule.
6. Fortnightly progress report should be duly filled by the students.
7. This Log book, along with the project report must be submitted to the project coordinator after TE mini project examination.
8. Students must carry log book with them, for every practical and project exhibition / Mock exam.

Project Guidelines for Students

1. Project can be in any area viz. Embedded, Signal Processing, Communication etc.
2. It can be sponsored/In-house.
3. Sponsorship letter format is available with Project Coordinators and it must be printed on college letter head.

4. For sponsored projects letter of sponsorship from the company is must and it must be submitted to the Project Coordinators
5. Out of three synopses, one will be finalized by project coordinator. Then you have to prepare PPT in given format and present it in front of industry experts. Once they approve your project submit final synopsis with all modifications suggested to project coordinator. Then, students can start with Literature Survey.
6. Mini Project Schedule has to be followed strictly for timely completion of the project work.
7. IEEE / Journal / Conference paper on selected / approved topic must be available with the students.
8. For downloading IEEE paper students may contact in main library and ask for IEL online membership subscription. Old IEEE hard copies are available in Main as well as Departmental Library.
9. Students should take part in various project competitions.
10. Also, they should try for copyrighting and patenting of their project idea.
11. At the time of project exhibition /competition project should be ready in all Aspects
12. For any further query related to project; students can contact to Project Guides and coordinators

Mini Project Schedule

Academic Year: 2021 – 2022 **Semester: II**

Sr.No.	Date	Work planned in Lab Hours
1	24/01/2022	Formation of groups, Submission of synopsis
2	31/01/2022	Finalization of Mini project & Distribution of work, Feasibility report Submission-
3	07/02/2022	Circuit Schematic and Simulation
4	14/02/2022	PCB artwork design
5	21/02/2022	PCB Manufacturing
6	28/03/2022	Hardware Soldering and Testing
7	07/03/2022	programming (if required) Testing,
8	14/03/2022	Enclosure Design, Fabrication etc
9	21/03/2022	Testing of final product
10	28/03/2022	Documentation- Preparation, Checking & Correcting of the Draft Copy of Report-One page report, PPTs, Poster, final Seminar Report
11	04/04/2022	Demonstration
12	11/04/2022	Group presentations

H.O.D. Project Coordinators Dr.

Mrs. R. S. Kamathe Dr.Mrs. K. A. Adoni, Mr. Ramgopal Sahu

Mini-Project Group Details

1. Project ID: A13

2. Title of Project: Scrolling Display using Neopixel LED Matrix

3. Area / Domain of Project (with consent of Project Guide): VLSI / Embedded / Signal Processing / Communication (tick appropriate option)

4. Type of Project (with consent of Project Guide): Application / Product / Research / Review (tick appropriate option)

5. Mapping of Project with PO & PSO (with consent of Project Guide):

6. Group Details:

2) Name of the Student: Omkar Ankush Kashid
Roll No: 32042
Mobile No: 7720954175
Email-id: Omkarkashidok@gmail.com

1) Name of the Student: Madhuri Navnath Mahale
RollNo: 32050
MobileNo: 7744823270
Email-id: madhurinmahale12345@gmail.com

3)Name of the Student:Shilpa Ratan Sanap
Roll No.:32069
Mobile No:7666921300
Email-id shilpasanap1825@gmail.com

Name of the Guide: Mr.Raamgopal Sahu

Undertaking

We, (Mr. / Ms.) Omkar Kashid,Madhuri Mahale,Shilpa Sanap of TE (E & TC) hereby assure, that we will follow the rules & regulations formulated by the University & the Department. We will follow the dates displayed in project schedule and in the notices.

The Project entitled Scrolling Display Using Neopixel LED Matrix will be fully designed & developed by us & no part of the work will be borrowed or purchased from any agency.

Name of Students Signature

1.Omkar Ankush Kashid

2. Madhuri Navnath Mahale

3.Shilpa Ratan Sanap

Synopsis

Title of the Project: Scrolling Display Using Neopixel LED Matrix

Group ID: A13

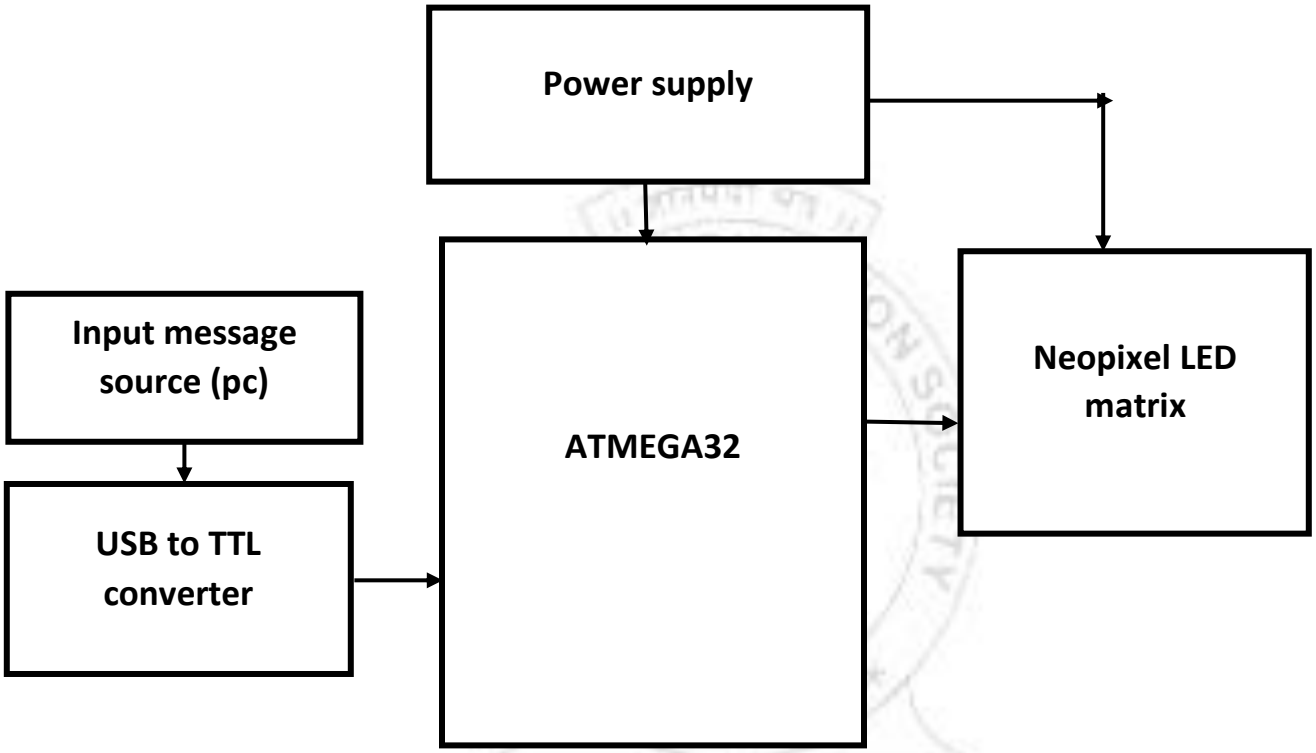
Aim:

In this project we will be building a Scrolling Display using Neopixel LED Matrix with Atmega microcontroller with the help of USB to TTL converter .This project includes LED strip of 300 led to control the text displayed over it and Scrolling LED display is implemented by using AVR microcontroller.

Objective:

1. To learn the working of a Scrolling Display using Neopixel LED Matrix
2. For advertisement methods like newspapers, posters, glow signboards, etc.
3. To learn how to build simple circuits.

Block Diagram:



After turn ON the power supply fix message get scrolling on the Led matrix display.

▪ Take the text message from PC into input buffer of microcontroller through USB to TTLconverter.

▪ Microcontroller Convert this text message into Led matrix display format. ▪ After conversion of text message into matrix format, Display it on LED matrix.

▪ Fix image can be display or animated which is stored into microcontroller memory.

▪ We can program each led separately with the help of fast led library we can create different animations and characters.

▪ After uploading code to Atmega Microcontroller should use a 6.0-ampere power supply. Because at maximum brightness a neopixel led draws around 20 mA current. We have total 300 LEDs so 300*20=6.0A.

Project Idea: control individually addressable RGB LEDs or a WS2812B LED strip using Atmega328.

Applications:

A. Educational Institution and Organization: Currently we rely on putting up papers on notice boards to inform people of events. This method can be discarded by using GSM based LED display to display information in real time. E.g. Placement news, cultural activities news, etc.

B. Advertisement: In shopping malls we get to hear the offers on various products from time to time. Instead we continuously display the information regarding the products and related offers on electronic display boards.

C. Railway Station: Instead of announcing the delay in arrival of trains we can display the information.

D. Hotels: To display the availability of the rooms and the room rents the type of rooms.

E. Nursing homes: To display the staff attendance, the availability of the doctors, the list of the specialized doctors, no of in patients etc.

Interaction with Mini-Project Coordinator

Sr.No	Date	Interaction with Mini-Project Coordinator	Sign of Students	Sign of MiniProject Coordinator
1.	**4/3/22**	**Different project ideas were discussed and synopsis related to 3 project ideas were submitted.The coordinator reviewed and finalized this idea.**		
2.	**16/3/22**	**The team was briefed about the various stages one has to go through from starting a project to leading it to completion.**		
3.	**20/3/22**	**The prototype of the project was discussed along with the necessary planning that would lead to a timely submission of the project.**		

Interaction with Industry Expert

Project ID: A13 Date of PPT Presentation: 28/05/2022

Project Title: Scrolling display using Neopixel LED Matrix

Modification Suggested: No Modification Suggested.

Name and sign of Industry Expert

Dr.Mrs.K.A.Adoni,Mr.Ramgopal sahu
Mini-Project Coordinators

Feasibility Report

I. Technical and Commercial Aspect

1. Availability of components:

Sr. No.	Name of Component	Specification	Quantity	Rate(Rs.)	Market Availability (Local/ Online)	Time to purchase	Total Cost (Rs.)
1	Neo WS28128B LED Matrix	Ws2812b RGB 5050smd Individual Addressable 3.3ft 60Pixels/m Flexible Black PCB Full Color LED Pixel Strip	1	3500	Online		3500
2	Artwork	PCB LAYOUT	1	500	offline		500
3	Film and PCB		1	1200	offline		1200
4	Atmega328	8-bit AVR microcontroller	2	250	offline		500
5	Arduino UNO	5V ,Digital I/O Pins: 14 PWM Digital I/O Pins: 6 Analog Input Pins: 6 DC Current per I/O Pin: 20 mA DC current for 3.3V Pin: 50 mA Flash Memory: 32 KB Clock Speed: 16 MHz Length: 68.6 mm Width: 58.4 mm Weight: 25 g	1	700	offline		700

6	USB Type D cable	Type D	1	170	offline		170
7	DS1307	RTC IC	1	90	offline		90
8	Battery	3.7V	1	25	offline		25
9	Crystal	16MHz	1	12	offline		12
10	Crystal	32768Hz	1	12	offline		12
			Grand Total				6736

***Note: If components are purchase online, mention shipping charges separately.**

2. Software tools required for PCB making, simulation, programming etc.?

Sr. No.	Software details (version, open source / license / trial / student)	System requirement for installation
1	Proteus software Arduino/PCB Design	Minimum I-3 processor 4GB ram Storage-8GB
2	Arduino IDE 1.8.19	Minimum I-3 processor 4GB ram Storage-8GB

II. Behavioral Aspect

i. Is the project hazardous to environment:

No it is not hazardous to environment.

ii.Have you considered societal, health, safety, legal and cultural issues while selecting project?

Yes , every issue is been considered and this project no way compromises any of these above mentioned aspects.

iii.Mention the applicability of the project:

- Used in big buildings where manual monitoring is difficult.
- Used in industries to control the liquid level automatically.

III. Distribution of Work

1. Name of student: Omkar Kashid

   a. Knowledge of component verification and testing:

   Yes

   b. Knowledge of software used

   Yes

   c. PCB making and soldering

   Yes

d. Programming Languages Known

Yes

e. Troubleshooting and testing skills

Yes

f. Planned Man hours 5hrs

2. Name of student: Madhuri Mahale

a. Knowledge of component verification and testing:

Yes

b. Knowledge of software used

Yes

c. PCB making and soldering

Yes

d. Programming Languages Known

Yes

e. Troubleshooting and testing skills

Yes

f. Planned Man hours 5hrs

2. Name of student: Shilpa Sanap

a.Knowledge of component verification and testing:

Yes

b.Knowledge of software used

Yes

c.PCB making and soldering

Yes

d.Programming Languages Known

Yes

e.Troubleshooting and testing skills

Yes

f. Planned Man hours 5hrs

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Plan of Action

Sr. No.	Date	Work planned	Signature of Students		
1	5/3/22	Formation of groups, Synopsis Submission			
2	7/3/22	Project finalization			
3	16/3/22	Distribution of work ,feasibility report submission			
4	18/3/22	Simulation			
5	20/3/22	PCB Design			
6	21/3/22	PCB building			
7	22/3/22	Soldering and Testing			
8	27/3/22	Programming and functionality			
9	29/3/22	Finishing , enclosing of project			
10	31/3/22	Testing and troubleshooting			
11	2/4/22	Documentations			

Name and Signature of Project Guide **Signature of Mini-Project Coordinators**

Dr.Mrs. K. A. Adoni, Mr. Ramgopal Sahu

Sponsorship Letter

(Paste Sponsorship Letter here)

Fortnightly Planning Sheet

Sr. No.	Date	Activity planned	Activity Executed	Sign of Students	Sign of Guide
1	16/3/22	Component Identification and distribution of work	Yes		
2	17/3/22	Component purchase and verification	Yes		
3	18/3/22	Simulation	Yes		
4	20/3/22	PCB design and manufacturing	Yes		
5	22/3/22	Soldering and testing	6	27/3/22	Troubleshooting
6	27/3/22	Troubleshooting	Yes		

7	31/3/22	Finalization and enclosure	Yes		

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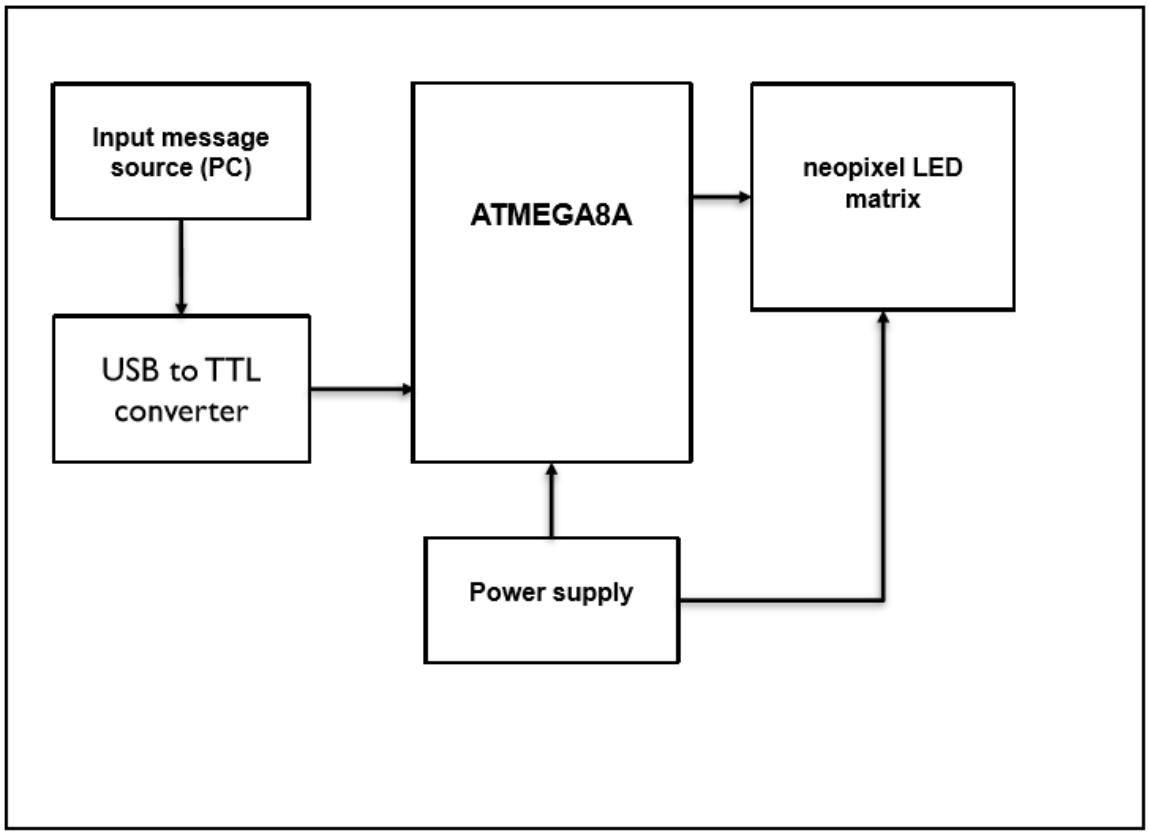
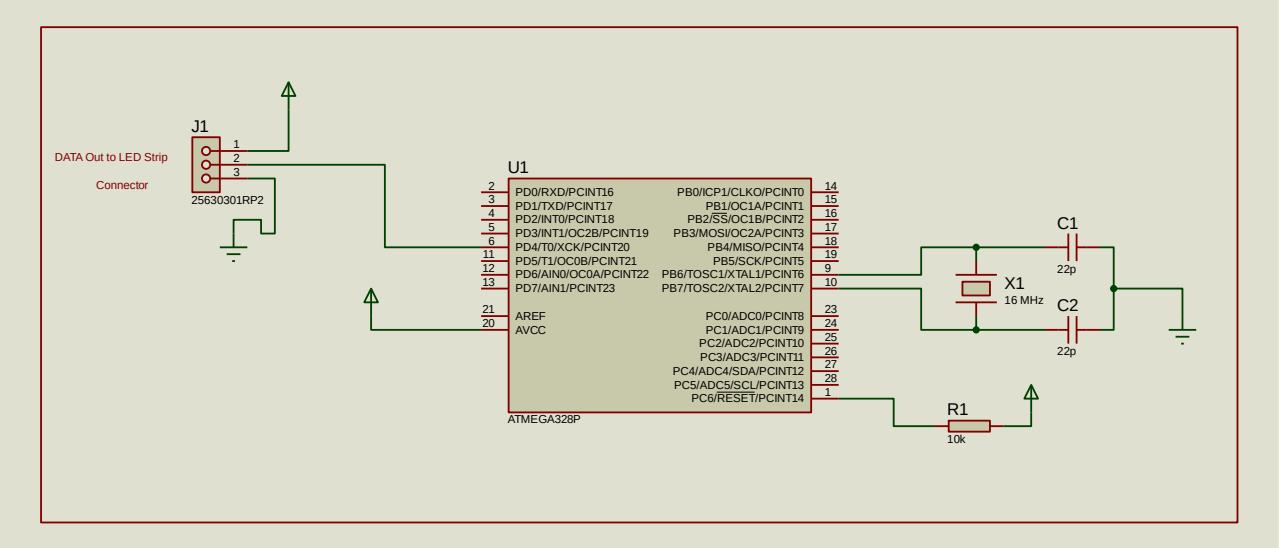
Block Diagram



Circuit Diagram



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Flowchart / Algorithm

Algorithm

1. Include the required Library.
2. Define Controller Port Pin to LED Matrix Data Pin.
3. Define Led Matrix Size.
4. Define LED Matrix Parameter.
5. Initialize LED Matrix.
6. Initialize RTC.
7. Take the Input Data which is display on LED Matrix.
8. Convert this ASCII text into Matrix format and fill into buffer.
9. Scroll this buffer Data on LED Matrix Display.
10. Goto step 7

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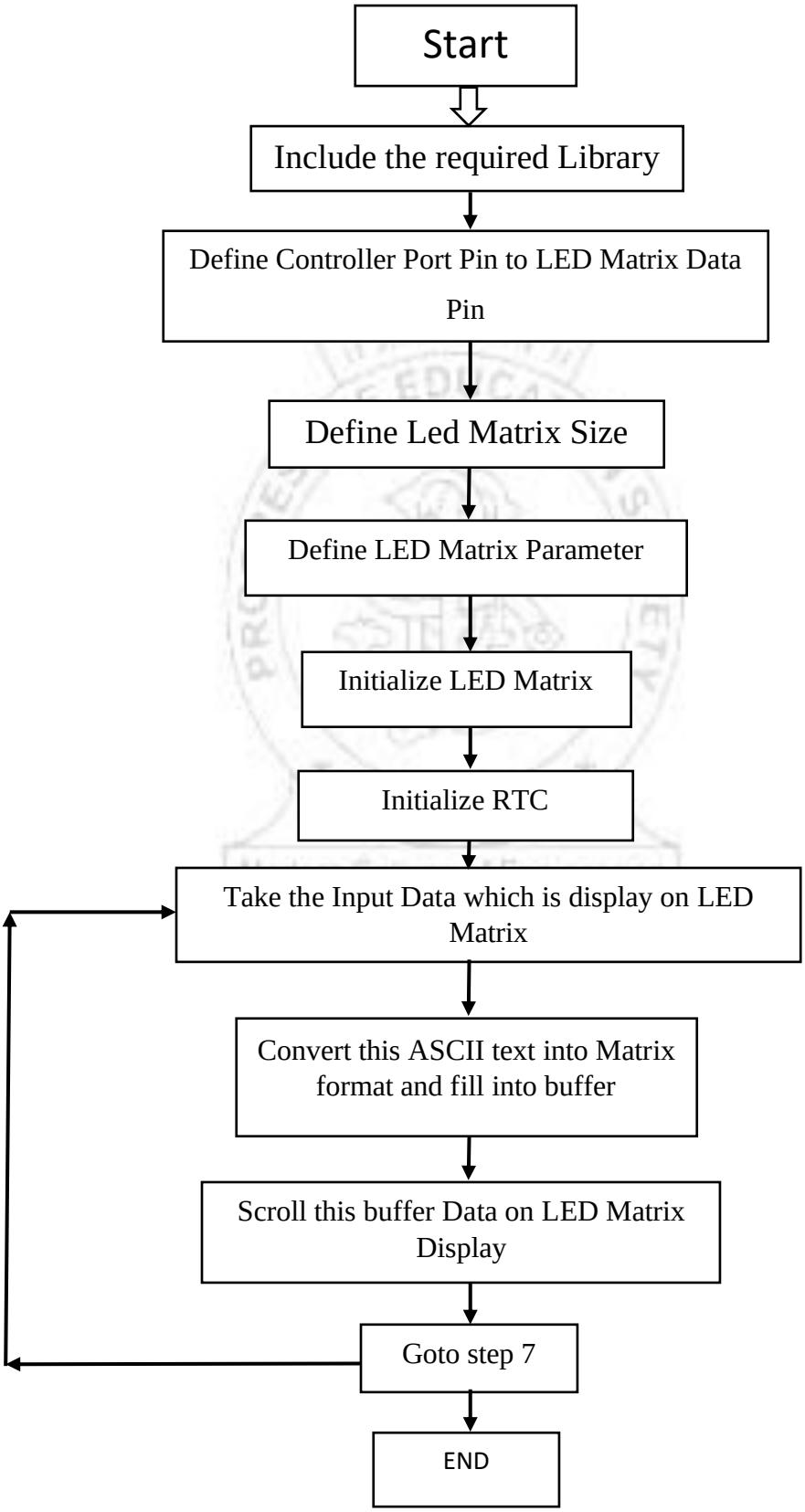
Flowchart


Start
Include the required Library
Define Controller Port Pin to LED Matrix Data Pin
Define Led Matrix Size
Define LED Matrix Parameter
Initialize LED Matrix
Initialize RTC
Take the Input Data which is display on LED Matrix
Convert this ASCII text into Matrix format and fill into buffer
Scroll this buffer Data on LED Matrix Display
Goto step 7
END

Rubrics for Evaluation of Project Exhibition

Parameter	Criteria	RATING			
		Average	**Satisfactory**	**Good**	**Excellent**
		1 or 2	**3**	**4**	**5**
Project Idea / Theme (CO1)	Creativity	Common idea and basic implementation	Simple idea and simple implementation	Simple idea but implemented innovatively	New project idea and implemented innovatively
Literature and Market Survey (CO1)	Coherence	Very limited Literature and Market survey	Literature and Market survey carried out , but able to explain some of them	Literature and Market survey carried out, but able to explain most of them	Appropriate Literature and Market survey, able to relate it with project parameters
Hardware / software implementation of Project (CO2)	Implementation	Hardware design and software design are partially ready.	Hardware design and software design are ready but results are not proper	Hardware design and software design are ready. Enclosure is yet to prepare. Project is ready with some good features and students are somewhat aware of technical know-how.	The project is ready in all aspects with some innovative features and students are thorough about technical knowhow
Speaking Skills, Presentation, (CO3)	Organization, Presentation Skills	Students are lacking in communication skills Need to improve Presentation skills for effective delivery	Project is ready but students lack in communicating technical know-how of it Few Team members were participated The presentation required slight changes to increase effectiveness of the contents and pace	The transitions and / or flow were somewhat difficult to follow. Team members were mostly audible and / or fluent on the topic	The transitions and flow was easy to follow. Slides were error - free and logically presented. Team members were poised and had clear articulation.
Extension (CO4)	Future Scope	With Minor Changes same implementation can be used for another application	Some changes gives Project Expansion to BE project	The Project Can be converted to Product Level	The Project Can be Patentable

Project Exhibition: Performance Evaluation

Project ID: A13

Project Title: Scrolling Display using Neopixel LED Matrix

_____

Remarks: _____

_____

_____

_____

_____

_____

Minor/ Major Features which can be added for improvement: _____

_____

_____

_____

Project Presentation: a) Excellent

b) Satisfactory

c) Needs improvement

Name and Sign of Internal Examiner	Name and Sign of Industry Expert	Name and Sign of Project Guide

Dr. Mrs. R. S. Kamathe
H.O.D.

Dr. Mrs. K. A. Adoni, Mr. Ramgopal Sahu
Mini Project Coordinators

Sponsoring Company Data

Project Title: Scrolling Display using Neopixel LED Matrix

Project ID: A13

Internal Project Guide:_____

External Project Guide: _____

Name of Students: 1.Madhuri Navnath Mahale

2.Omkar Ankush Kashid

3.Shilpa Ratan Sanap

Name of The Sponsoring Company	
Address	
Office Contact Number	
HR Contact Details (Name, Email-ID, Phone)	
Website	
Work Domain of Company(Product Technology Used)	
Wide Area of Company (e. g Signal Processing, Communication)	

Sponsoring Company Visit Report

Project Title: _____

Project ID: _____

Internal Project Guide: _____

External Project Guide: _____

Date of Visit: _____

Time of Visit:_____

Name of the Sponsoring Company: _____

Progress Discussed: _____

_____

_____

Project Status (Percent Project Completion & Expected Date of Completion):

Sign of Internal Project Guide **Sign of External Project Guide**

Project Progress Report

Title of Project:-Scrolling Display using Neopixel LED Matrix

Work Done:- All the hardware as well as necessary implementation work is completed . All the documentation required for a project is also done as per instructions.

Achievements:-

The project was done in a proper and planned manner. Also all the goals associated with this project were met. Thus , all the expected program outcomes were achieved leading to a successful completion and submission of this project.

Signature of Students	**Signature of Guide**	**Signature of H. O. D.**
Madhuri Mahale		
Omkar Kashid		
Shilpa Sanap		

Photograph of completed project (to be pasted at the end of project completion)

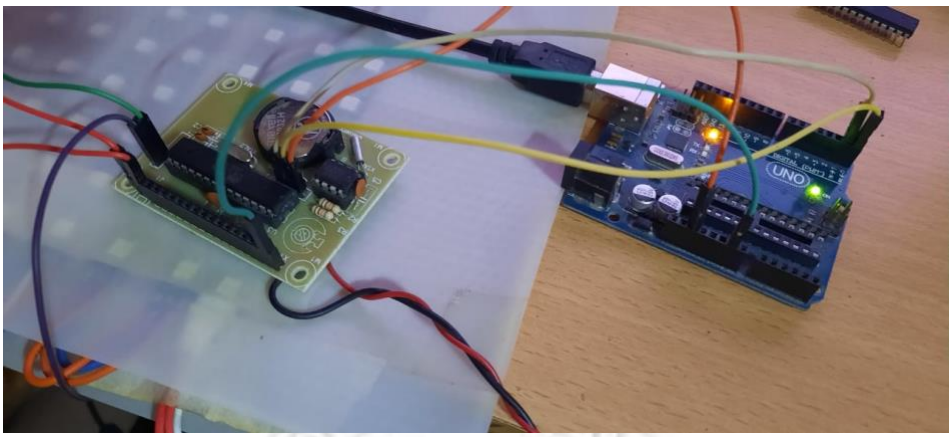


Fig. PCB And Arduino for transfer program form system to the processor Atmega328 using serial pins of Arduino

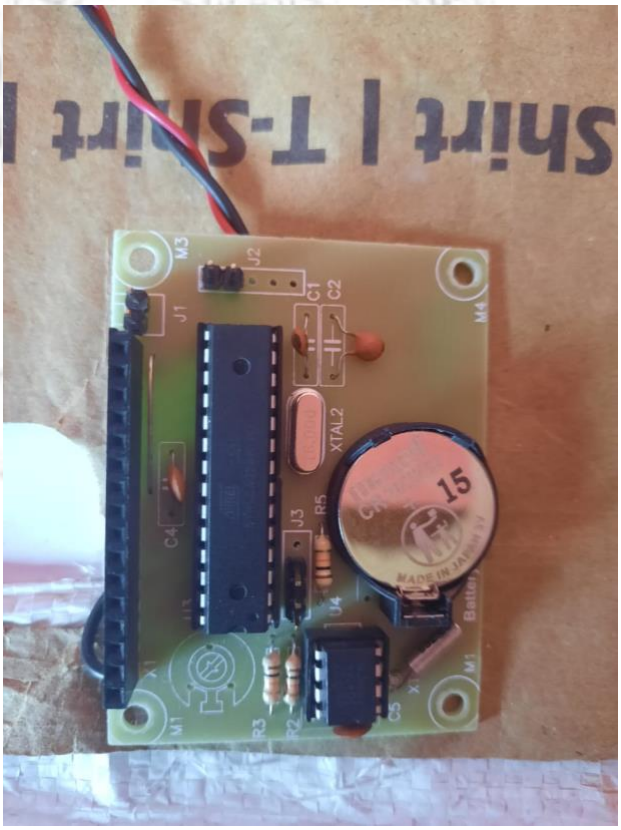


Fig. PCB Mounted

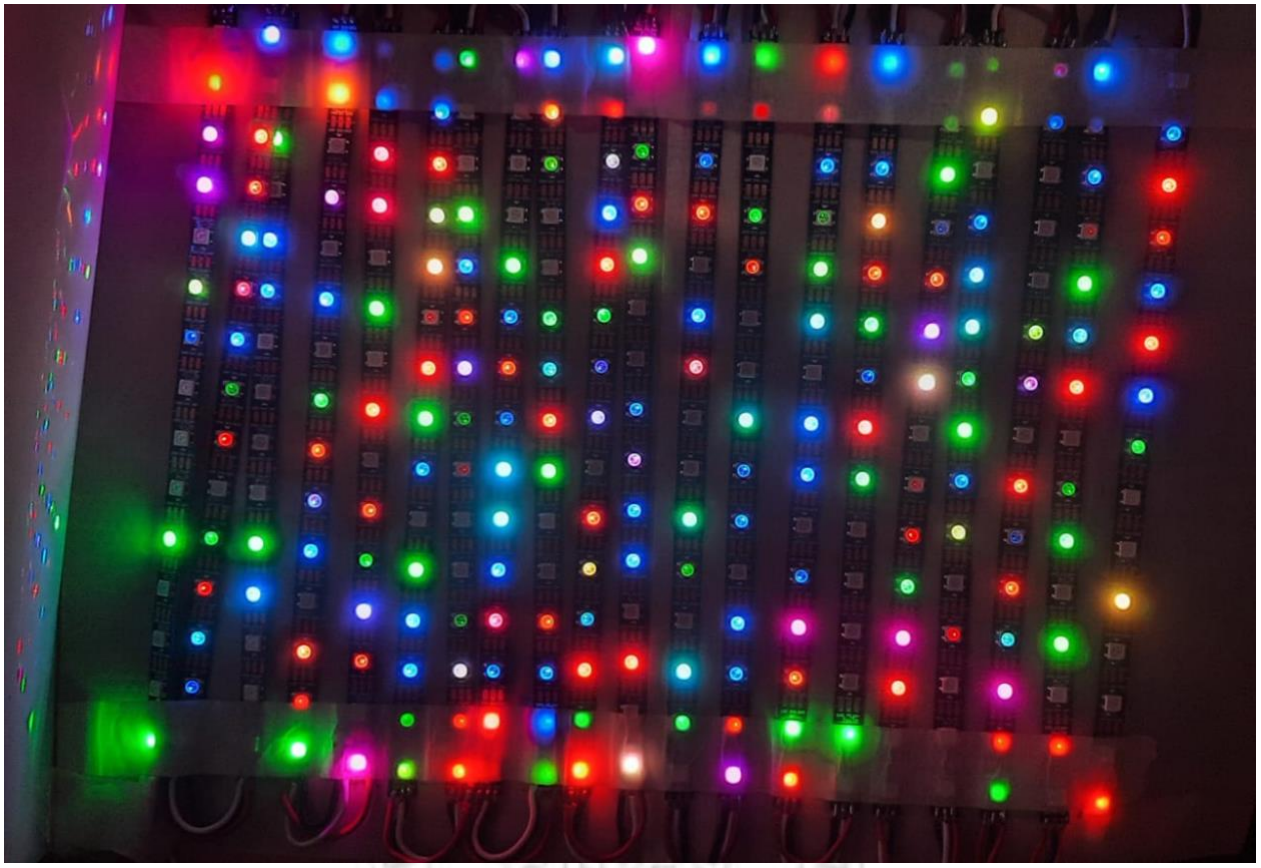


Fig. Random LED display

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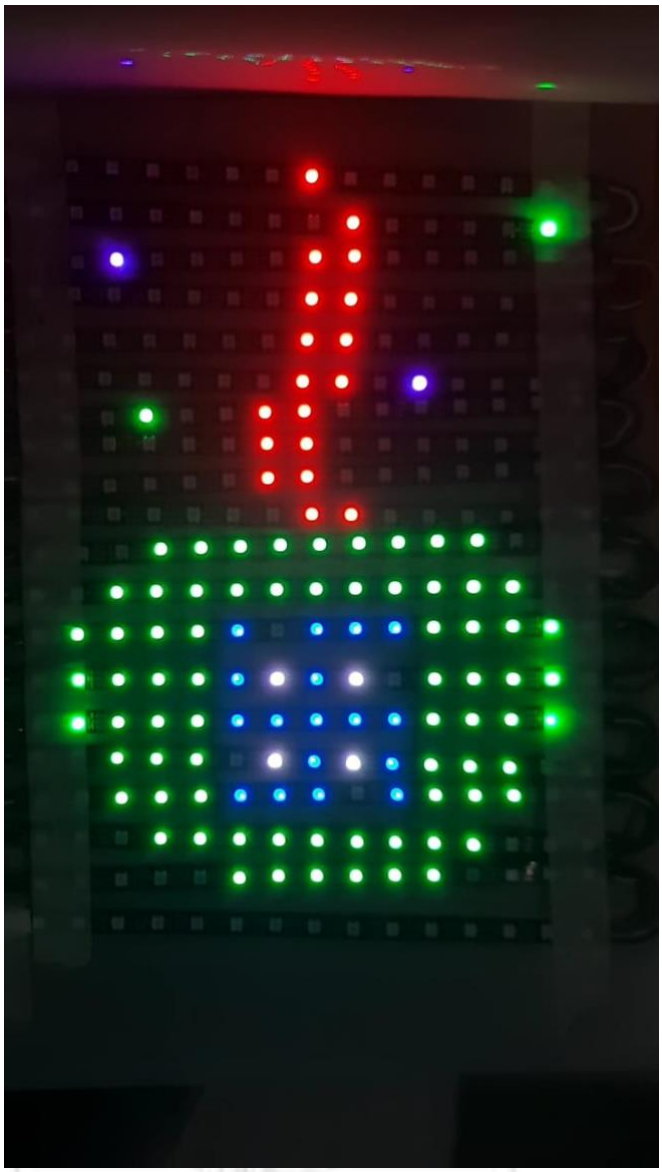

Fig. Scrolling Panti

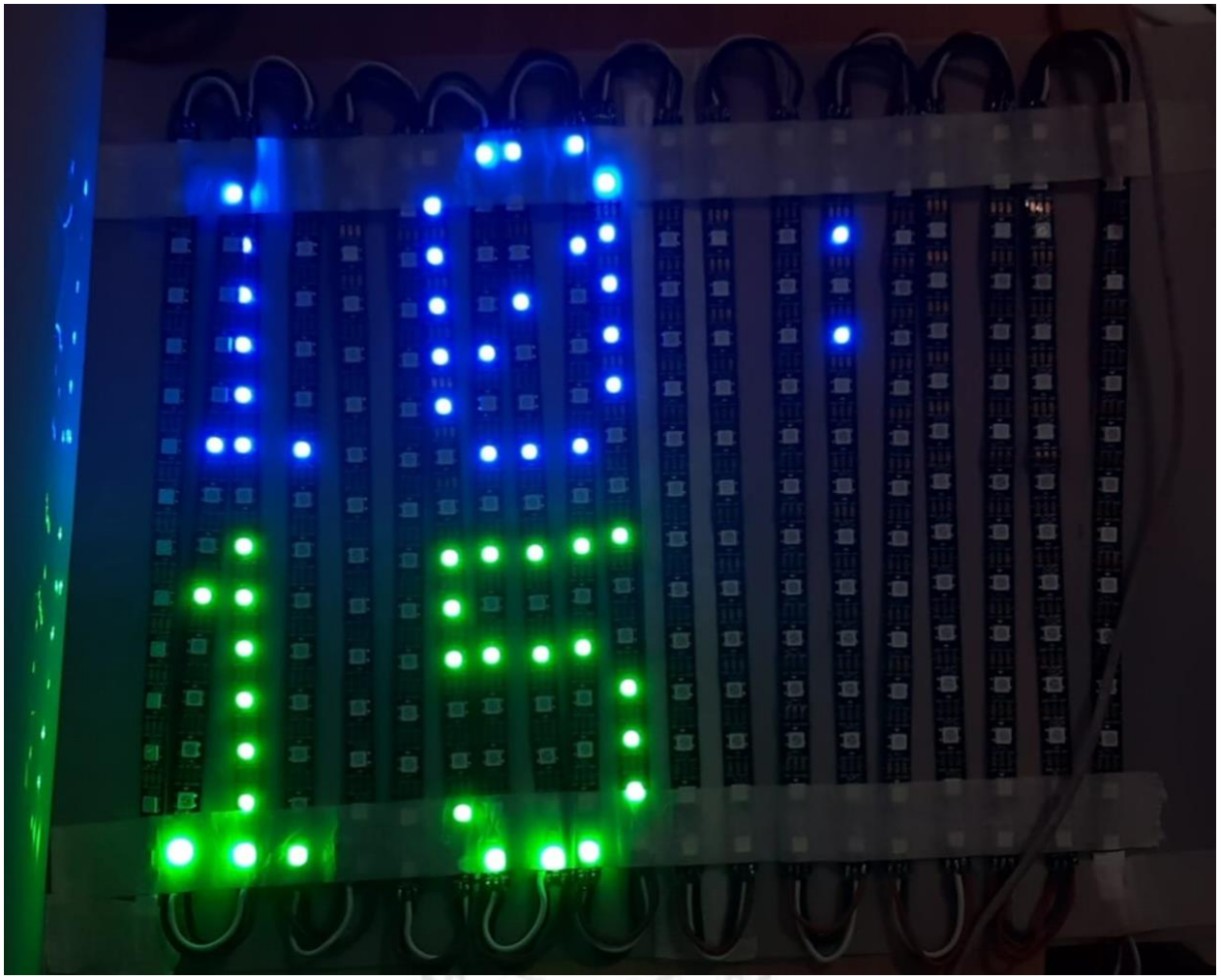

Fig. RTC real time clock

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Fig. Scrolling message

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