



ANNA UNIVERSITY
Madras Institute of Technology

CS6105 – Digital Fundamental of Computer
Organisation

Department of Computer Technology

PROJECT REPORT ON
“Scrolling Display Text with Arduino Uno”

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MINI SCROLLING TEXT DISPLAY

WITH ARDUINO NANO



➤ **Scrolling text
Display with
Arduino Uno**

Bonafide Certificate

This is to certify that the project entitled **Scrolling Text Display Using Arduino** is a bonafide work carried out by the following students of **Madras Institute Of Technology, Anna University**, in partial fulfillment of the requirements for the **Computer Technology** during the academic year **2023-2024**.

Project Details:

Scrolling Text Display Using Arduino

- **Course:** Computer Technology
- **Semester:** 3

Group Members:

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Declaration:

We hereby declare that the project work presented in this report is our own and has been carried out under the supervision of our project guide. We also affirm that this work has not been submitted elsewhere for any examination or project.

ACKNOWLEDGMENT

We extend our heartfelt gratitude to our project guide, Dr. V.P. Jayachitra whose guidance and support were indispensable throughout the project. Our appreciation also goes to the faculty, staff, and our peers at Madras Institute of Technology, Anna University for their valuable contributions and collaborative spirit. Special thanks to our friends and family for their unwavering support. This project would not have been possible without the combined efforts of everyone mentioned. Thank you.

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Introduction



Creating a captivating scrolling text display using Arduino is a venture into the enthralling convergence of technology and creativity. In this extensive project, we embark on an intricate exploration of the Arduino microcontroller, positioning it as the architect behind a visually stimulating experience. Imagine, if you will, messages elegantly traversing an LED matrix or other display mediums, dynamically capturing attention and evoking curiosity. As we immerse ourselves in this comprehensive endeavor, we unearth the foundational elements of Arduino programming, navigating through

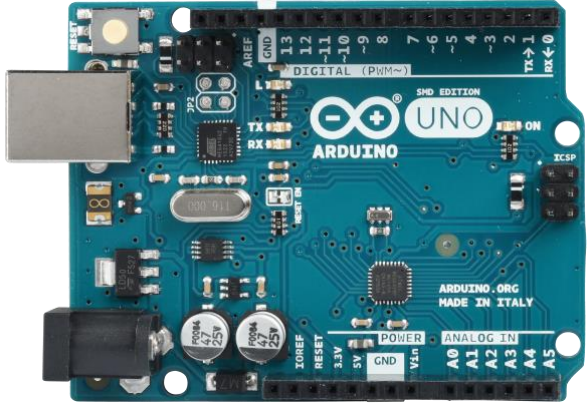


the complex interplay between hardware and software. Whether you find yourself at the inception of your journey into the Arduino ecosystem, seeking an immersive introduction, or are a seasoned enthusiast eager to broaden your repertoire, this project promises a rich and multifaceted exploration of coding, circuitry, and the seamless fusion of technological components.


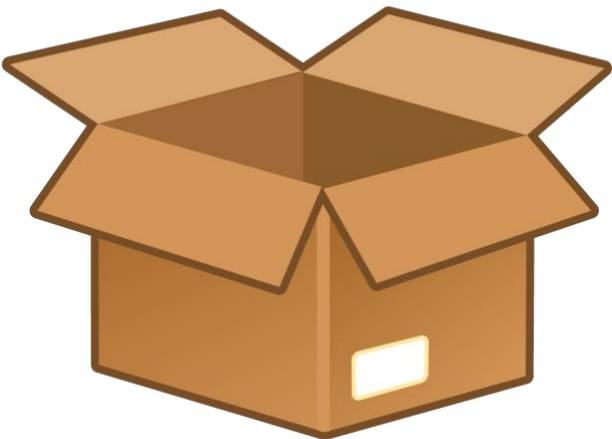

Within the confines of this extensive documentation, we methodically guide you through each step, demystifying the intricacies of crafting a compelling scrolling text display. Along this illuminating path, we provide invaluable insights into the underlying principles of embedded systems, offering not just a practical tutorial but a profound understanding of the mechanisms at play. Picture yourself captivated by the allure of a display that marries imagination and execution seamlessly, with the Arduino acting as the conduit for the captivating dance of scrolling text.

Prepare for an odyssey into the heart of Arduino creativity, where the canvas of your display becomes a tapestry for the limitless potential of innovation. As we delve deeper, every line of code becomes a brushstroke, propelling you further into the vast realm

of creativity. So, with boundless enthusiasm, let us embark on this extensive journey, unraveling the intricate threads that weave together the marvel of a scrolling text display, where the world of Arduino becomes not just a platform but a playground for the expansive landscapes of imagination and technical prowess.

COMPONENTS USED

1.	Arduino Uno	
2.	Jumper Wire	
3	4 in one (8*32) dot matrix display module	

4.	Arduino Uno Cable wire	
5.	Box	
6.	9V AC Adapter Works with Arduino Uno	

PROCEDURE

Creating a scrolling text display matrix with a 4-in-1 (8x32) dot matrix display module, Arduino Uno, and jumper wires involves several steps. Here's a comprehensive step-by-step procedure to guide you through the process:

Materials Needed:

Arduino Uno

4-in-1 (8x32) dot matrix display module

Jumper wires

External power supply (if required)

Step 1: Gather Components

Ensure you have all the necessary components mentioned above.

Step 2: Wiring Connections

Connect the dot matrix display module to the Arduino Uno using jumper wires. Follow the pin mapping of your specific display module. Generally, connections include data, clock, latch, and power pins. Connect them to the corresponding pins on the Arduino.

Step 3: Install Required Libraries

If your dot matrix display module requires specific libraries, install them in the Arduino IDE. You can usually find the required libraries on the manufacturer's website or on popular online repositories.

Step 4: Upload Arduino Code

Write or download a scrolling text display Arduino code that is compatible with your dot matrix display module.

Customize the code as needed, considering the display size and orientation. Upload the code to your Arduino Uno using a USB cable.

Step 5: Power Supply

If the display module requires more power than the Arduino can provide, connect an external power supply to the display module. Ensure the ground of the external power supply is connected to the Arduino ground for a common ground reference.

Step 6: Test the Display

Power up the Arduino Uno, and you should see the scrolling text on the dot matrix display. If the text is not scrolling correctly or there are display issues, double-check your wiring connections, code, and library installations.

Step 7: Troubleshooting

If there are issues, refer to the datasheets of your components and carefully check the wiring, code, and library compatibility. Make necessary adjustments and re-upload the code.

Step 8: Customize and Experiment

Experiment with different texts, fonts, and scrolling speeds in your code. Customize the display to suit your preferences and use cases.

Step 9: Secure the Setup

If you plan to keep your scrolling display as a permanent project, consider securing the components on a breadboard or a custom-made PCB. This will ensure stability and durability.

By following these step-by-step instructions, you should be able to create a scrolling text display matrix with a 4-in-1 (8x32) dot matrix display module and Arduino Uno successfully.

CODE:

Code

```
// Including the required Arduino libraries
```

```
#include <MD_Parola.h>
```

```
#include <MD_MAX72xx.h>
```

```
#include <SPI.h>
```

```
#define HARDWARE_TYPE MD_MAX72XX::FC16_HW
```

```
// Defining size, and output pins
```

```
#define MAX_DEVICES 4
```

```
#define CLK_PIN 13
```

```
#define DATA_PIN 11
```

```
#define CS_PIN 10
```

```
// Create a new instance of the MD_Parola class with  
hardware SPI connection
```

```
MD_Parola myDisplay = MD_Parola(HARDWARE_TYPE,  
CS_PIN, MAX_DEVICES);
```

```
void setup() {
```

```
    // Intialize the object
```

```
myDisplay.begin();
```

```
// Set the intensity (brightness) of the display (0-15)
```

```
myDisplay.setIntensity(0);
```

```
// Clear the display
```

```
myDisplay.displayClear();
```

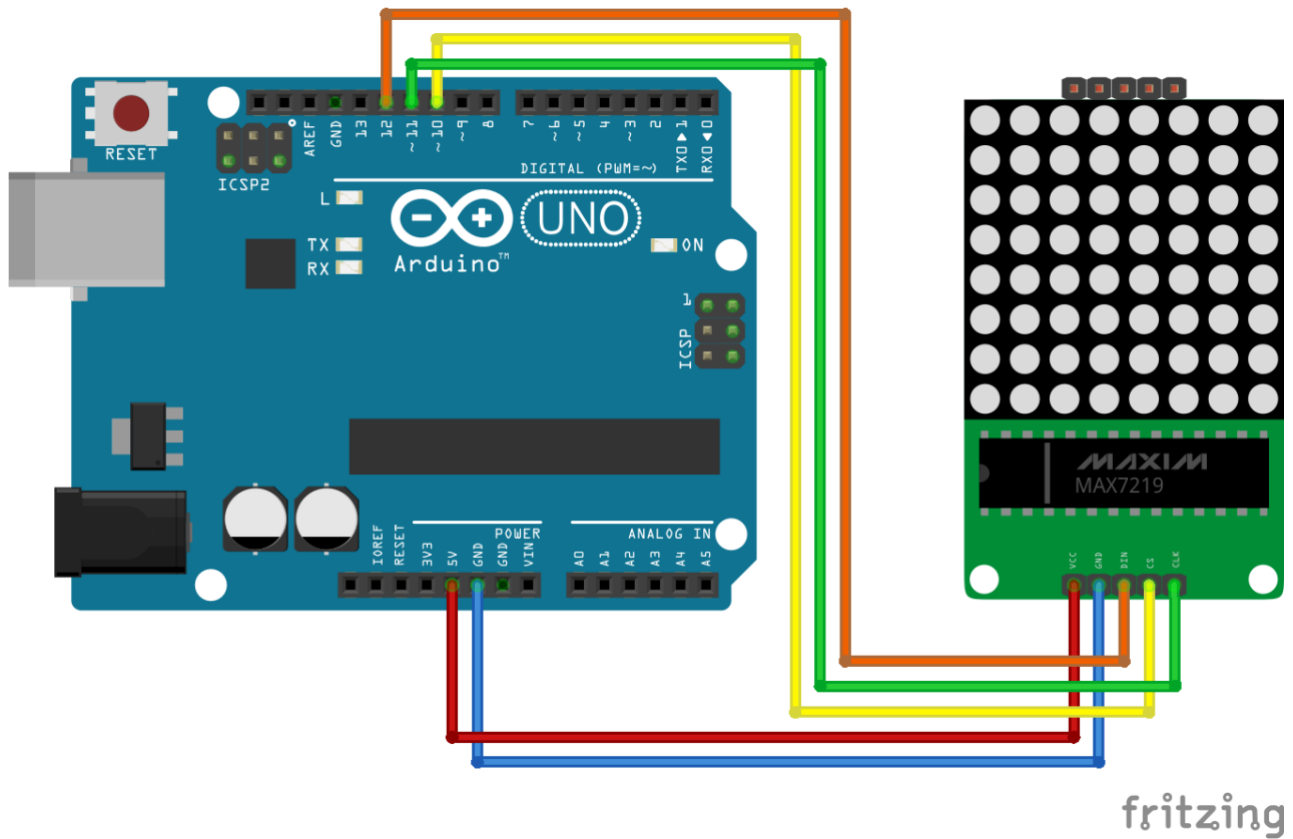
```
myDisplay.displayText("Dr.V.P.Jayachitra", PA_CENTER, 90,  
200, PA_SCROLL_LEFT , PA_SCROLL_LEFT );
```

```
}
```



```
void loop() {  
  
  if (myDisplay.displayAnimate()) {  
  
    myDisplay.displayReset();  
  
  }  
  
}
```

CIRCUIT DIAGRAM



Advantages and Disadvantages of Scrolling Display Text using Arduino

Using Arduino for scrolling text displays offers several advantages and some potential disadvantages. Here's a breakdown of both:

Advantages:

1. **Cost-Effective:** Arduino boards are relatively inexpensive, making them a cost-effective solution for simple text displays.
2. **Ease of Programming:** Arduino is designed to be user-friendly, with a simple programming environment that is accessible to beginners. This makes it easy to program scrolling text displays without advanced coding skills.
3. **Community Support:** Arduino has a large and active community. If you encounter problems or need help with your scrolling text display project, there's a good chance that someone in the Arduino community has faced a similar issue and can offer guidance.

Versatility: Arduino boards can be easily integrated with various sensors and other components, allowing you to create interactive and dynamic scrolling text displays. This versatility is beneficial for creating customized and feature-rich projects.

4. **Open Source:** Arduino is an open-source platform, which means that the hardware and software designs are freely available. This openness encourages collaboration, innovation, and the sharing of projects within the community.

Disadvantages:

1. **Limited Processing Power:** Arduino boards have limited processing power compared to more powerful microcontrollers and processors. This limitation might constrain the complexity and speed of scrolling text animations or the amount of text that can be displayed.
2. **Limited Memory:** Arduino boards typically have limited memory, which can be a constraint when dealing with large amounts of text or complex graphics. This limitation may require optimization of code and storage considerations.

3. **Limited Display Resolution:** The display capabilities are often determined by the external display hardware rather than the Arduino itself. If you are using a simple LED matrix or similar display, the resolution may be limited, affecting the quality of the text display.
4. **Power Consumption:** Depending on the display used, power consumption can be a consideration. If you're using a power-hungry display or running the Arduino on battery power, you may need to optimize your code and hardware to conserve energy.
5. **Learning Curve for Beginners:** While Arduino is beginner-friendly, there is still a learning curve, especially if you are new to programming and electronics. Some individuals may find it challenging to get started initially.

Uses of Scrolling Display Text using Arduino

Scrolling text displays using Arduino can be employed in various applications, adding a dynamic and informative element to your projects. Here are some common uses:

1. Information Displays:

Display real-time information such as weather updates, stock prices, or news headlines.

Present data from sensors, such as temperature, humidity, or air quality.

2. Public Announcements:

Use scrolling text displays for public announcements in schools, offices, or public spaces.

Display event schedules, meeting times, or important notices.

3. Advertising and Promotions:

Create attention-grabbing displays for advertising and promotions.

Showcase product features, discounts, or upcoming events in retail environments.

4. Interactive Displays:

Combine scrolling text with sensors to create interactive displays.

Allow users to interact with the display to get additional information or control certain elements.

5. Clocks and Timers:

Implement scrolling text to display the time, date, or countdowns.

Create a visually appealing clock or timer display for various applications.

6. Name Badges and ID Tags:

Develop scrolling text name badges for events, conferences, or trade shows.

Add a professional and dynamic touch to identification tags.

7. Educational Projects:

Use scrolling text displays in educational projects to teach programming, electronics, and data visualization.

Display educational content or quiz questions in an engaging manner.

8. Gaming and Entertainment:

Integrate scrolling text into gaming projects to display scores, messages, or game-related information.

Enhance entertainment systems with dynamic visual elements.

9. Notification Systems:

Implement scrolling text displays for notification systems.

Display alerts, reminders, or important messages in a visible and attention-grabbing way.

10. Art Installations:

Incorporate scrolling text into art installations for a dynamic and visually appealing effect.

Use programmable LEDs or displays to create interactive art.

11. Traffic and Transportation Displays:

Display traffic information, bus schedules, or transportation updates in public spaces.

Provide real-time information for commuters.

12. Custom Messages and Quotes:

Personalize your space by displaying custom messages, quotes, or greetings.

Change messages based on time of day or special occasions.

13. Scrollers for Costumes and Wearables:

Integrate scrolling text displays into costumes or wearables for added visual impact.

Create attention-grabbing accessories for events or performances.

When working with scrolling text displays, the versatility of Arduino allows for creativity and customization in various projects, making them suitable for a wide range of applications across different domains.

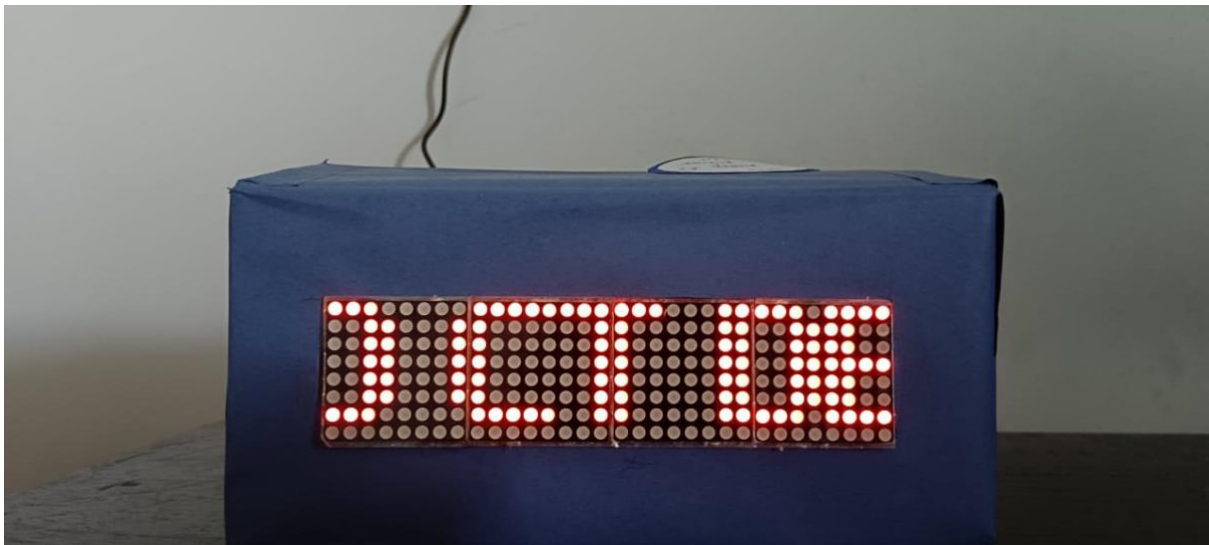
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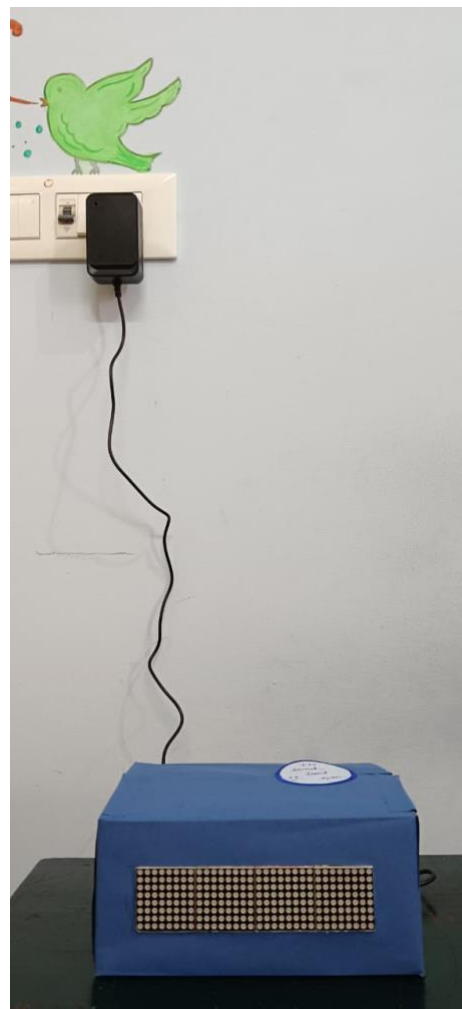
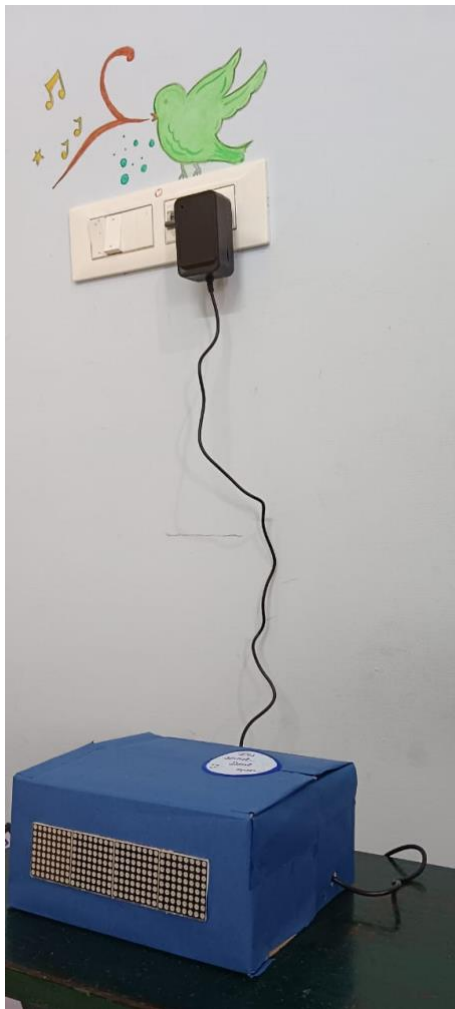
In the ever-evolving landscape of technology and innovation, the future applications of scrolling display text using Arduino promise a multitude of exciting possibilities. As we move forward, these dynamic displays are anticipated to play a pivotal role in enhancing user engagement and communication across diverse domains. In smart cities, scrolling text displays could serve as interactive public information systems, providing real-time updates on transportation, weather, and local events, fostering a more connected and informed community. Moreover, in the realm of education, Arduino-powered scrolling text displays may revolutionize traditional teaching methods by creating interactive and visually stimulating learning environments. As wearable technology continues to advance, integrating scrolling text displays into garments could redefine personal expression, allowing individuals to dynamically showcase messages, art, or even vital health information. Furthermore, in retail and advertising, the future holds the potential for immersive and attention-grabbing displays that utilize Arduino's versatility to convey product information, promotions, and brand messages in an engaging manner. The adaptability of Arduino in combination with scrolling

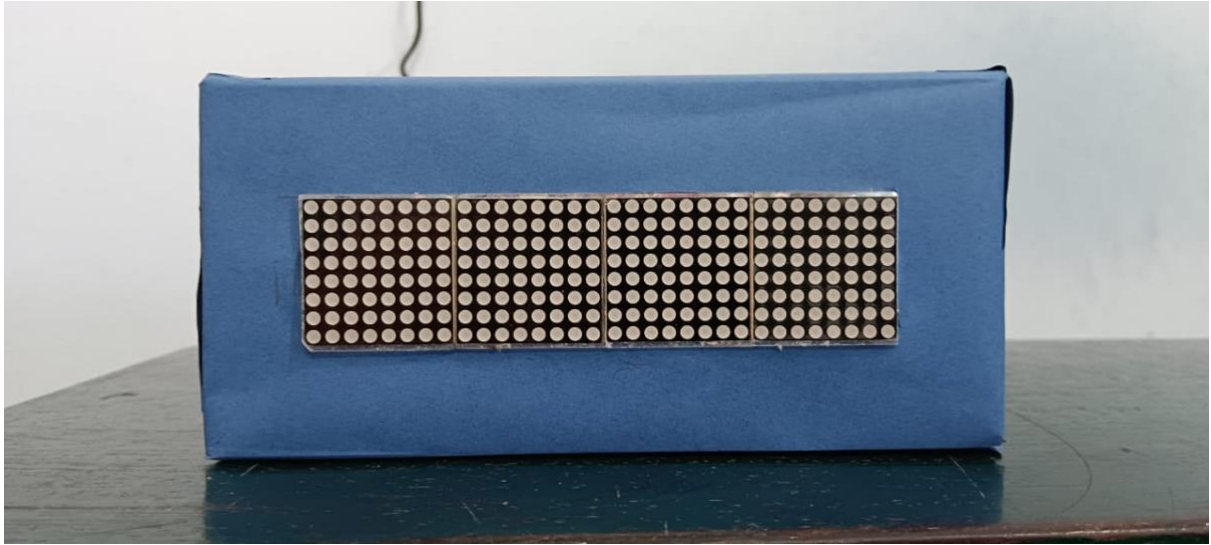
text displays also foresees applications in emergency notification systems, providing timely and visible alerts in public spaces. As the Internet of Things (IoT) expands its influence, the integration of Arduino-based scrolling text displays into smart homes and environments could offer seamless and customizable information dissemination. The collaborative nature of the Arduino community ensures a continuous influx of creative ideas, propelling the future of scrolling text displays into uncharted territories where innovation knows no bounds. In essence, the marriage of Arduino technology and scrolling text displays heralds a future where information is not only accessible but presented dynamically, captivating audiences across industries and enriching our daily experiences with a touch of innovation and interactivity.

PROJECT MODEL

IMAGES:







CONCLUSION

In conclusion, the use of scrolling text displays with Arduino presents a compelling avenue for innovation and creative expression. As a versatile and cost-effective platform, Arduino empowers individuals across various fields to implement dynamic and interactive text displays in a multitude of applications. From public information systems and educational projects to wearable technology and smart cities, the future of scrolling text displays holds immense potential for transforming how we communicate and interact with information. The collaborative and open-source nature of the Arduino community ensures a continuous flow of ideas, fostering a landscape where the boundaries of creativity are constantly pushed. As we navigate the evolving landscape of technology, the marriage of Arduino and scrolling text displays promises to play a significant role in shaping the way we receive and engage with information, ultimately contributing to a more connected, informed, and visually enriched world.