

Avr-GCC Assignment

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I. ABSTRACT

The information bit sequence 111010101 is to be transmitted by encoding with Cyclic Redundancy Check 4 ($CRC-4$) code, for which the generator polynomial is $C(x) = x^4 + x + 1$. The encoded sequence of bits is:

II. COMPONENTS

The required components list is given in Table: I. The pin out diagram of LCD is:

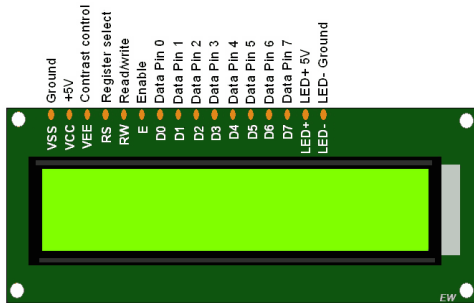


Fig. 1.

Components	Value	Quantity
LCD	16 × 2	1
Arduino	UNO	1
Jumper Wires		20
Breadboard		1

TABLE I

III. PROCEDURE

To execute avr-gcc in Termux and display the output on an LCD via Arduino, first install the AVR toolchain using 'pkg install avr-gcc'. Write your Arduino code in a '.c' or '.cpp' file, ensuring it initializes the LCD (using the **LiquidCrystal** library). Compile the program using 'avr-gcc -mmcu = atmega328p -DF_CPU = 16000000UL -

oprogram.elfprogram.c', then convert it to a hex file using 'avr-objcopy -O ihex program.elf program.hex'. To upload the hex file, connect Arduino to Termux using an OTG cable, and run 'avrdude -c arduino -p m328p -P /dev/ttyUSB0 -b 115200 -U flash:w:program.hex'. Once uploaded, connect the LCD to Arduino as per the LiquidCrystal library's pin configuration. Power the setup to see the output on the LCD, confirming the program's execution.

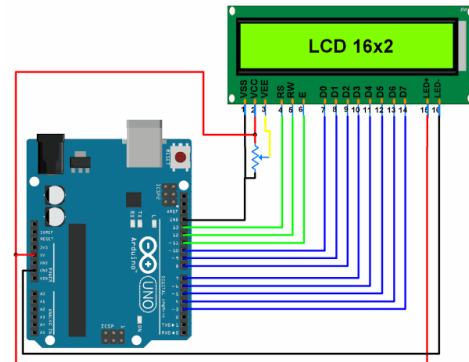


Fig. 2.

IV. RESULTS

Download the avr-gcc code given in the link below and execute them to see the output as shown in Fig.3, where the output is displayed on the LCD screen.
<https://>

V. CONCLUSION

In conclusion, CRC-4 (Cyclic Redundancy Check) is a robust error-detection method commonly used in digital networks to ensure data integrity by generating a 4-bit checksum. It efficiently detects errors in transmitted data, making it crucial in communication systems. On the other hand, **AVR-GCC** is a powerful toolchain that allows the development

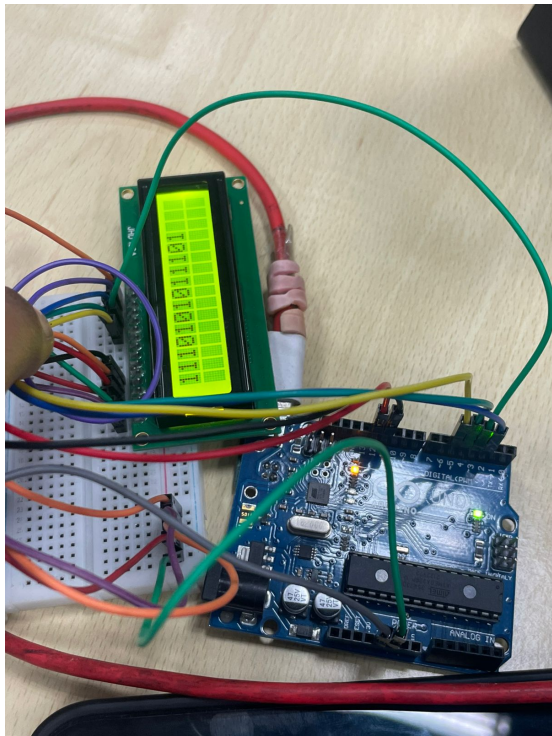


Fig. 3.

and compilation of programs for AVR microcontrollers, such as those used in Arduino. The combination of CRC techniques and AVR-GCC enables the creation of reliable, error-checked embedded systems, ensuring accurate data transmission and robust microcontroller programming for various applications.