LED BLINKING CIRCUIT

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OBJECTIVE:-

The objective of making an LED blinking circuit is to understand and demonstrate basic concepts of electronics, such as:

>Learn how to build and analyze a simple electronic circuit.

>Practice using components like resistors, LEDs, and power sources.

>Understand how LEDs work (polarity, forward voltage, current-limiting resistor, etc.).

>If using a timer (like 555 timer or microcontroller), learn how to generate pulses or delays.

>Identify and connect components like resistors, capacitors, ICs, and transistors correctly.

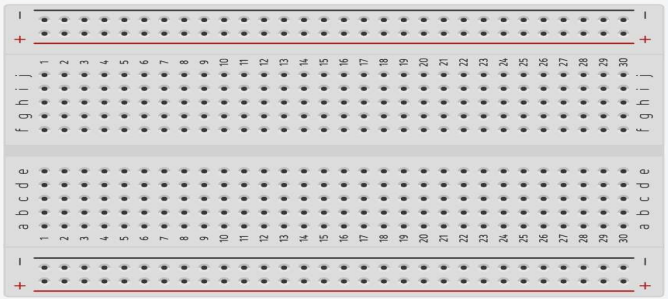
COMPONENT USED:-

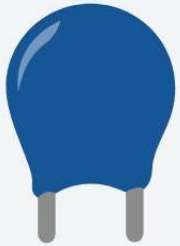
- Arduino Board UNO R3:- Microcontroller to run code.
- LED:- Visual output.
- Resistor (220Ω):- Limits current to the LED.
- USB Cable:- For uploading code and power in simulation.
- Jumper Wires:- Connect Arduino pins to LED circuit.
- Breadboard(small):- for clean wiring.

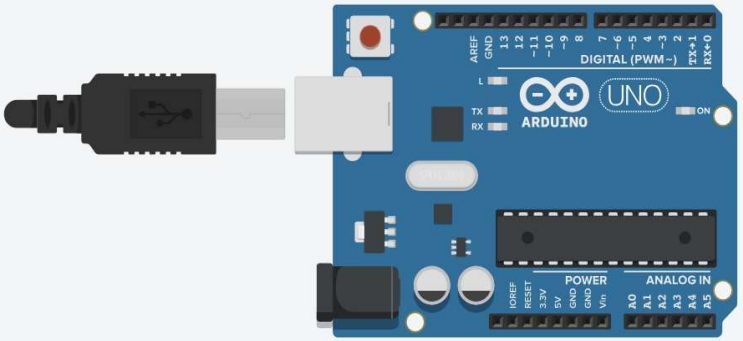
OPTIONAL COMPONENTS FOR MORE ADVANCED BLINKING CIRCUITS:

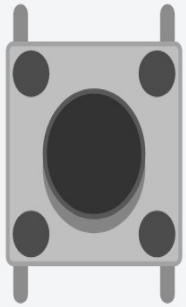
- Transistor (e.g., BC547, 2N2222)
- Potentiometer
- Microcontroller (e.g., Arduino, ESP32, STM32)
- Light Dependent Resistor (LDR)
- Temperature Sensor (e.g., LM35)
- IR Sensor
- Ultrasonic Sensor
- Relay Module
- Shift Register (e.g., 74HC595)
- Push Button
- Toggle Switch
- Capacitors (Various values)
- Diodes
- Buzzer (for alert with blink)
- LCD or OLED Display
- Resistor Network Arrays
- Photoresistor Modules
- RTC Module (for timed blinking)
- Bluetooth/Wi-Fi Module (e.g., HC-05, ESP8266)
- Power MOSFET (e.g., IRFZ44N)

COMPONENT IMAGES:-

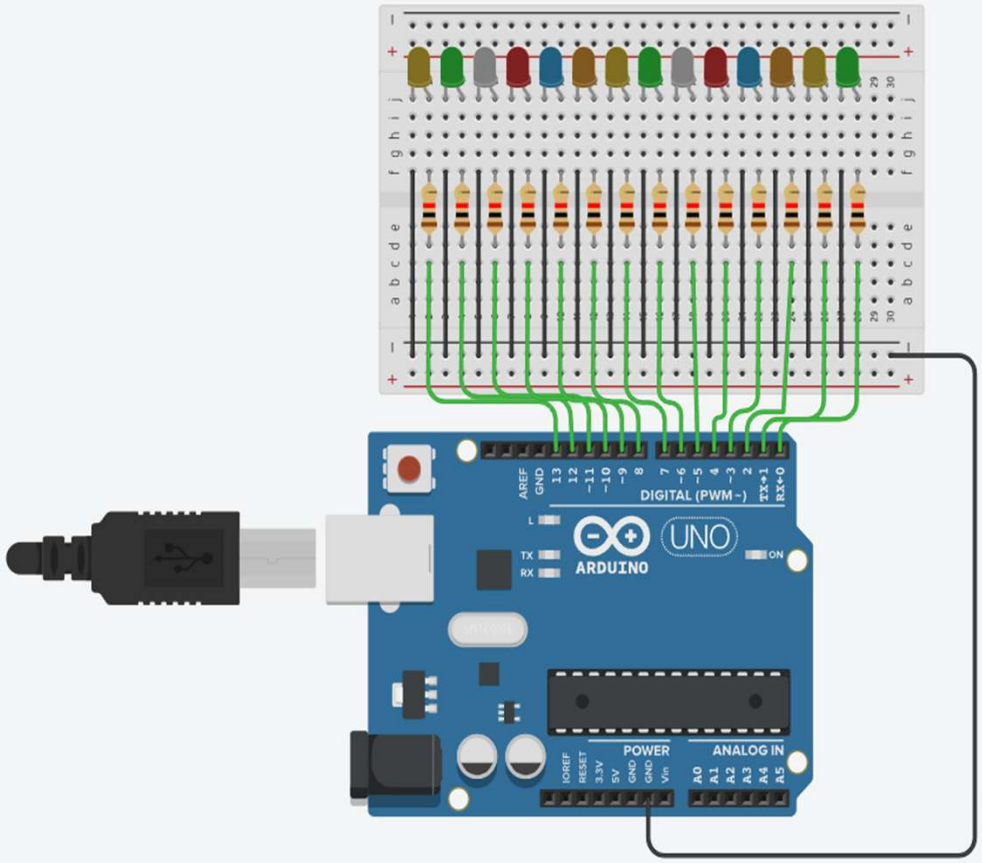




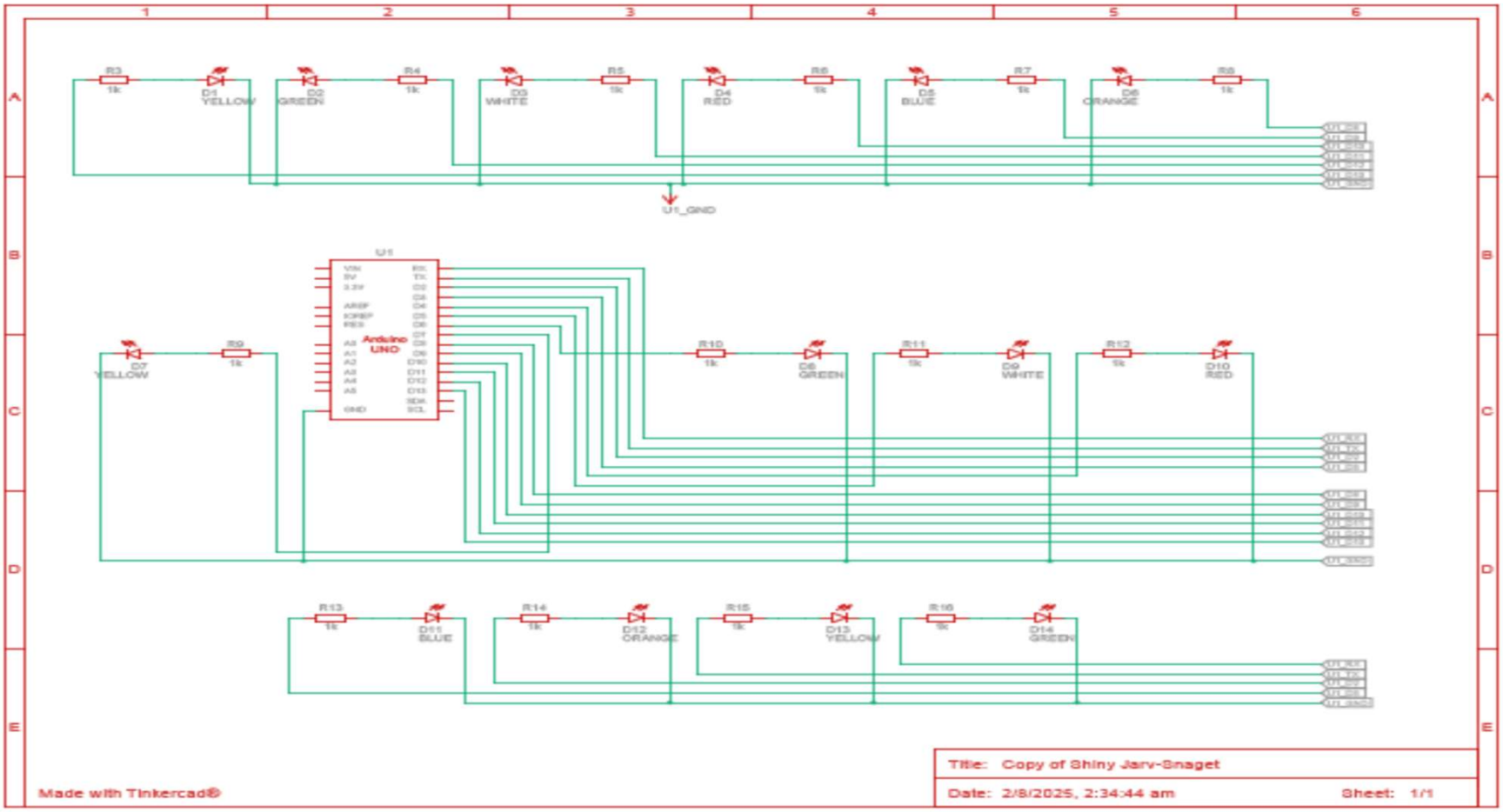




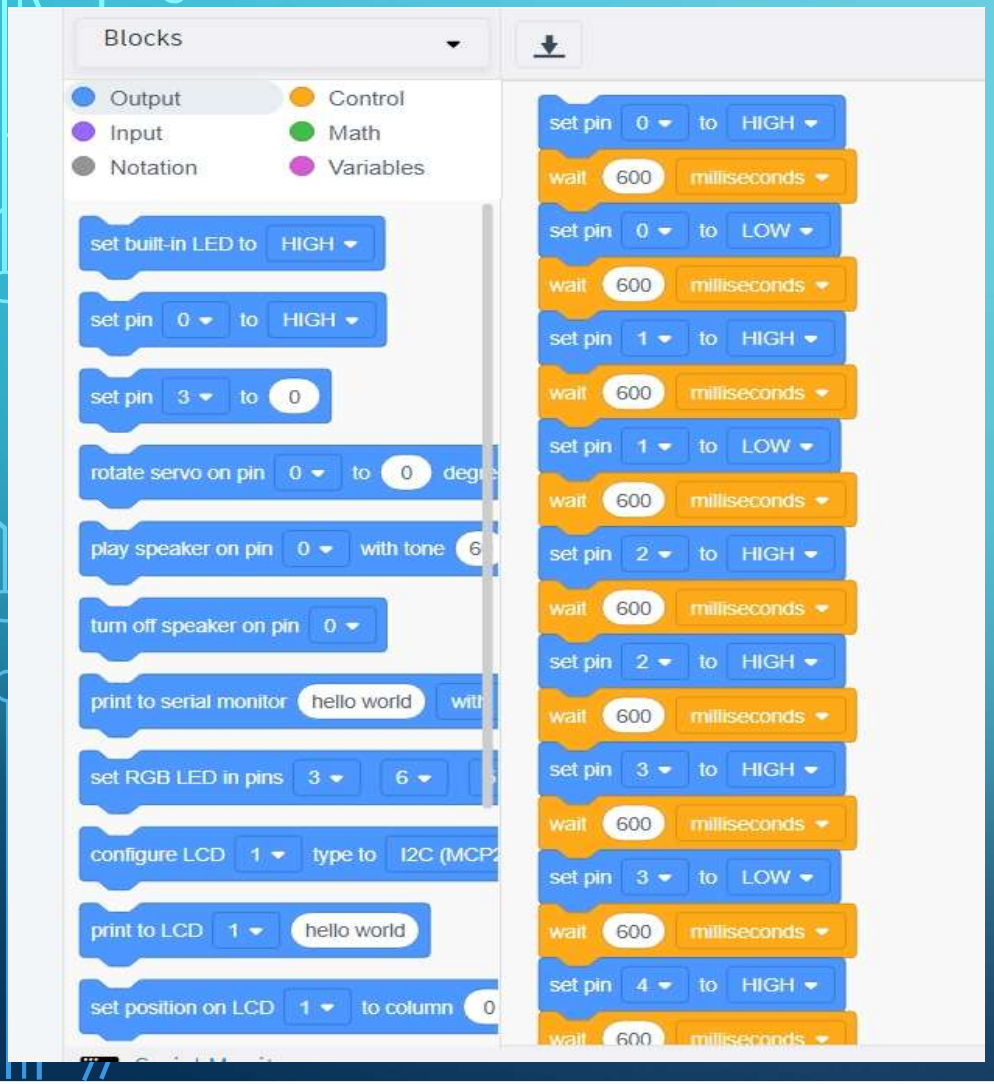
CIRCUIT DIAGRAM:-

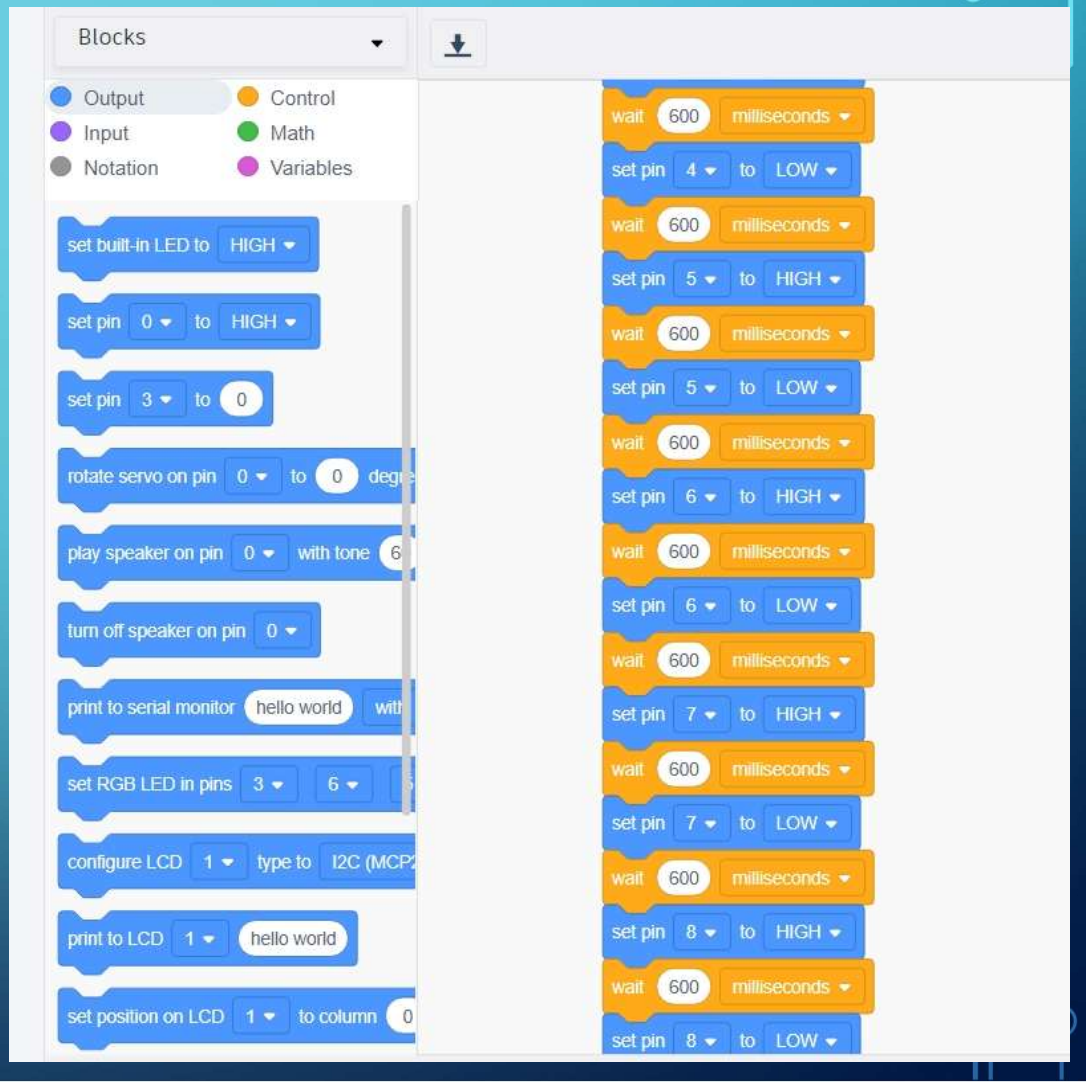


SCHEMATIC DESIGN:-



BLOCK CODE:-


Blocks
Output
Control
Input
Math
Notation
Variables
set built-in LED to HIGH
set pin 0 to HIGH
set pin 3 to 0
rotate servo on pin 0 to 0
play speaker on pin 0 with tone 6
turn off speaker on pin 0
print to serial monitor hello world
set RGB LED in pins 3 6
configure LCD 1 type to I2C (MCP2
print to LCD 1 hello world
set position on LCD 1 to column 0
set pin 0 to HIGH
wait 600 milliseconds
set pin 0 to LOW
wait 600 milliseconds
set pin 1 to HIGH
wait 600 milliseconds
set pin 1 to LOW
wait 600 milliseconds
set pin 2 to HIGH
wait 600 milliseconds
set pin 2 to HIGH
wait 600 milliseconds
set pin 3 to HIGH
wait 600 milliseconds
set pin 3 to LOW
wait 600 milliseconds
set pin 4 to HIGH
wait 600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set pin 4 to LOW
wait 600 milliseconds
set pin 5 to HIGH
wait 600 milliseconds
set pin 5 to LOW
wait 600 milliseconds
set pin 6 to HIGH
wait 600 milliseconds
set pin 6 to LOW
wait 600 milliseconds
set pin 7 to HIGH
wait 600 milliseconds
set pin 7 to LOW
wait 600 milliseconds
set pin 8 to HIGH
wait 600 milliseconds
set pin 8 to LOW

CODE SNIPPET:-

```
// C++ code//void setup()
{pinMode(0, OUTPUT);
pinMode(1, OUTPUT);
pinMode(2, OUTPUT);
pinMode(3, OUTPUT);
pinMode(4, OUTPUT);
pinMode(5, OUTPUT);
pinMode(6, OUTPUT);
pinMode(7, OUTPUT);
pinMode(8, OUTPUT);
pinMode(9, OUTPUT);
pinMode(10, OUTPUT);
pinMode(11, OUTPUT);
pinMode(12, OUTPUT);
pinMode(13, OUTPUT);}
void loop() {
for (int pin = 0; pin <= 13; pin++)
{    digitalWrite(pin, HIGH);
delay(600);
digitalWrite(pin, LOW);
delay(600);
}}
```

CONCLUSION:-

- The LED blinking circuit is a fundamental and practical electronics project that demonstrates the core principles of electrical components, timing control, and circuit design. Whether implemented using a simple switch, a 555 timer IC, or a programmable microcontroller like Arduino, the blinking LED serves as a valuable tool for:
- Understanding current flow and resistance.
- Learning component functionality (LEDs, resistors, ICs, etc.).
- Gaining experience in circuit building and troubleshooting.
- Exploring automation and timing concepts.
- Forming a base for more complex systems like alerts, indicators, or smart control systems.

APPLICATION OF LED BLINKING CIRCUIT:-

- Home Appliance – Blinking LED on a Wi-Fi router to show internet activity.
- Automotive System – Car turn signal indicator.
- Industrial Equipment – Blinking LED on a control panel to show machine fault.
- Medical Device – Blinking LED on a patient heart rate monitor.
- Educational Project – Arduino LED blink as first test program.
- Public Infrastructure – Blinking amber traffic light at pedestrian crossing.
- Security System – Blinking LED on a motion sensor alarm device.

THANK YOU….