Propellor Led Display

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Synopsis :-

In a normal 8*8 Led display, 64 leds would be used to display characters and numbers. To do this we would require a way to control all the leds using either a Display IC or some multiplexer and decoders.

The propeller display is in a way like LED Matrix. It contains 8 LEDs (Light Emitting Diodes) which are arranged in the form of an 8*1 matrix (8 rows and 1 column). They are arranged in the form of ladder one over the other. These 8 LED can be made to display any content like text, numbers, symbols etc. This is achieved by Perception of Vision (POV), in which many still images are moved quickly one by one in a sequence, which gives a perception of animation or a moving image or in our case a character.

We move the first LED COLUMN to the second LED COLUMN place by using the motion of DC MOTOR.In order to understand the whole situation, say we want 'A' to be displayed by the propeller display. Consider the LED 'needle' is at POSITION1 at first as shown in figure below. **LED Needle** is the Column of 8 LEDs
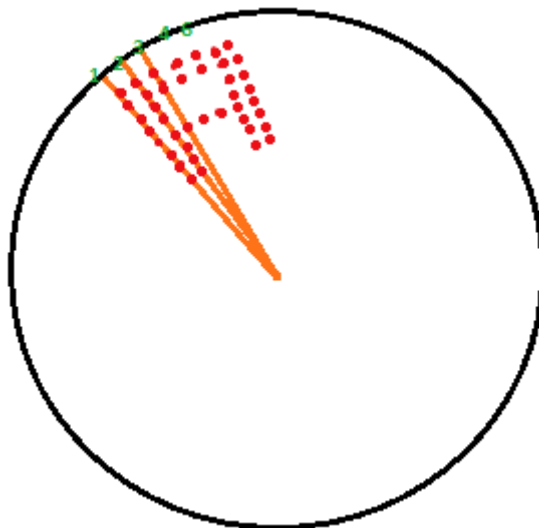
Now we will power the motor and it will start running.

At t=0ms: the needle will be at POSITION 1. At this position all the eight LEDs, from TOP LED (MSB) to BOTTOM LED (LSB), are powered on.

At t=1ms: the needle will be at POSITION 2. Same as Position 1, at this position all the eight LEDs, from TOP LED (MSB) to BOTTOM LED (LSB), are powered on.

At t=2ms: the needle will be at POSITION 3. At this position only LED7, LED6 & LED3 stay ON and remaining LEDs are turned OFF.

At t=3ms: the needle will be at POSITION 4. Same as Position 3, at this position only LED7, LED6 & LED3 stay ON and remaining LEDs are turned OFF.

At t=4ms: the needle will be at POSITION 5. Same as Position 3 & 4, at this position only LED7, LED6 & LED3 stay ON. Remaining LEDs are turned OFF.

At t=5ms: the needle will be at POSITION 6. At this position all the eight LEDs are again powered on,TOP led (MSB) to BOTTOM led (LSB) are turned ON.

At t=6ms: the needle will be at POSITION 7. Same as Position 6, at this position all the eight LEDs remain on.

As explained above, we will turn ON appropriate LEDs at the appropriate Needle Positions to display the necessary character. If the speed of movement of needle is slow we can see each LED column separately. But when the speed of motor is high and needle is moving too fast then the display will be seen as continuously showing "A" character.

Hardware Used :-

We would require follwing hardware will be used.

1) Arduino nano

2) 8 Leds (Single Colour)

3) Resistors

4) Board to solder all materials

5) Battery to power all electroincs

6) DC motor

7) Magnet and hall sensor (optional)

8) Solder machine and hot glue gun

9) Conducting wires

Circuit Design :-