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<a name="home"></a><br />
<div style="text-align: center;">
<a href="#">[KEMBALI KE MENU SEBELUMNYA]</a></div>
<br />
<center>
<div style="background-color: white; border: 2px dashed rgb(23, 128, 221); height: 240px; overflow:
auto; padding: 10px; text-align: center; width: 330px;">
<b>DAFTAR ISI</b>
<br />
<div style="text-align: left;">
<a href="#prosedur">1. Prosedur</a></div>
<div style="text-align: left;">
<a href="#hardware dan diagram">2. Hardware dan diagram blok</a></div>
<div style="text-align: left;">
<a href="#rangkaian dan prinsip">3. Rangkaian simulasi dan prinsip kerja</a></div>
<div style="text-align: left;">
<a href="#flowchart">4. Flowchart dan listing program</a></div>
<div style="text-align: left;">
<a href="#kondisi">5. Kondisi</a></div>
<div style="text-align: left;">
<a href="#video">6. Video simulasi</a></div>
<div style="text-align: left;">
<a href="#link">7. Link Download</a></div>
<div style="text-align: left;">
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</div>
</center>
<span style="font-family: &quot;times&quot; , &quot;times new roman&quot; , serif;"><span
style="font-family: &quot;times&quot; , &quot;times new roman&quot; , serif;"><b><div
style="font-size: medium;"><span style="font-family: &quot;times&quot; , &quot;times new
roman&quot; , serif;"><span style="font-family: &quot;times&quot; , &quot;times new roman&quot;
, serif; font-size: small;"><b><br /></b></span></span></div><span style="font-size: medium;"><div
style="text-align: center;"><br /></div><div style="color: #990000;"><span style="font-family:

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class="separator" style="clear: both; text-align: center;"></div><div class="separator" style="clear: both; text-align: center;">
</div>
</div><div>3. Driver Motor L293D</div><div><div class="separator" style="clear: both; text-align: center;"></div>
<div class="separator" style="clear: both; text-align: center;">
</div></div><div>4. Max7219</div><div><div class="separator" style="clear: both; text-align: center;"></div><div class="separator" style="clear: both; text-align: center;">
</div>5. Dot Matrix</div><div class="separator" style="clear: both; text-align: center;"></div><div class="separator" style="clear: both; text-align: left;">6. Motor DC</div><div class="separator" style="clear: both; text-align: center;"><a href="https://blogger.googleusercontent.com/img/b/R29vZ2xl/AVvXsEiHjEY17ZWqvEbfiTPbtpnOGldDVNq_6uB4WreVt-nG-BNCn59CP6LO9lzUIvyKj8BRf4apZicHE1zgdiaayMpgmwWN9ptjJONafWKrVgVFINDGzJ3NJYnqDSJw3ijOVPh6ZQ2btwnEA1s_hVzYkojA83vLwT9yKjRNMmrAtTHZtySa9fLeZd9YiJpsGJ45EU/s1

80/motor%20dc.jpg" style="margin-left: 1em; margin-right: 1em;"></div><div class="separator" style="clear: both; text-align: center;">
</div><div>Diagram Blok</div><div><div class="separator" style="clear: both; text-align: center;"></div></div>
<div>

3. Rangkaian simulasi dan prinsip kerja

[Kembali]</div><div><div><div class="separator" style="clear: both; text-align: left;">
</div></div><div class="separator" style="clear: both; text-align: left;"><div class="separator" style="clear: both; text-align: justify;">Rangkaian percobaan sebelum disimulasi</div><div class="separator" style="clear: both; text-align: center;">
</div><div class="separator" style="clear: both; text-align: center;"></div><div class="separator" style="clear: both; text-align: center;">
</div><div class="separator" style="clear: both; text-align: justify;">Rangkaian percobaan setelah disimulasi</div><div class="separator" style="clear: both; text-align: center;">
</div><div class="separator" style="clear: both; text-align: center;"></div><div class="separator" style="clear: both; text-align: center;"><br style="font-family: times; font-size: large;" /></div><div class="separator" style="clear: both; text-align: left;">Prinsip Kerja</div><div class="separator" style="clear: both; text-align: left;">
</div><div class="separator" style="clear: both; text-align: left;">Prinsip kerja rangkaian yaitu, ketika diberi logika high pada sensor infrared maka ia akan memberi daya ke driver motor L293D sehingga akan ada input yang dihasilkan pada driver motor tersebut. kemudian karena inputan pada motor driver ada maka akan ada pula output yang dihasilkan yaitu berupa motor. pada dot matrix dihubungkan ke arduino sesuai pin-pin nya agar dot matrixnya dapat hidup. Jika dipswitch 1 dan 3 dihidupkan maka motor akan bergerak ke kiri dan pada dot matriks akan menampilkan panah sebelah kiri juga . Jika dipswitch 2 dan 4 dihidupkan maka motor akan bergerak ke kanan dan dot matrix akan menampilkan panah ke kanan. Apabila tidak ada kondisi diantara 2 kondisi diatas maka motor akan diam dan dot matrix akan menampilkan tanda silang.</div><div class="separator" style="clear: both; text-align: left;">
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</div>

4. Flowchart dan listing program

[Kembali]</div><div><div><div class="separator" style="clear: both; text-align: center;">
</div></div><div class="separator" style="clear: both; text-align: left;">Flowchart</div><div class="separator" style="clear: both; text-align: left;">
</div><div class="separator" style="clear: both; text-align: center;"></div><div class="separator" style="clear: both; text-align: center;">
</div><div class="separator" style="clear: both; text-align: center;">
</div><div class="separator" style="clear: both; text-align: left;">Listing Program</div><div class="separator" style="clear: both; text-align: left;">
</div><div class="separator" style="clear: both; text-align: left;"><div class="separator" style="clear: both; text-align: justify;"><div class="separator" style="clear: both;"><div class="separator" style="clear: both;">#include <LedControl.h> // Mengimpor pustaka LedControl untuk mengontrol modul MAX7219 yang terhubung dengan dot matrix LED.</div><div class="separator" style="clear: both;">
</div><div class="separator" style="clear: both;">// Inisialisasi objek LedControl dengan pin DIN, CLK, LOAD (CS) yang terhubung ke Arduino.</div><div class="separator" style="clear: both;">LedControl lc = LedControl(5,6,7,1);</div><div class="separator" style="clear: both;">
</div><div class="separator" style="clear: both;">// Array untuk menyimpan pola LED yang akan ditampilkan.</div><div class="separator" style="clear: both;">byte patterns[8] = {0, 0, 0, 0, 0, 0, 0, 0};</div><div class="separator" style="clear: both;">
</div><div class="separator" style="clear: both;">// Pengaturan pin untuk dipswitch dan motor.</div><div class="separator" style="clear: both;">const int in1 = A0;</div><div class="separator" style="clear: both;">const int in2 = A1;</div><div class="separator" style="clear: both;">const int in3 = A2;</div><div class="separator" style="clear: both;">

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style="clear: both; ">const int in4 = A3;</div><div class="separator" style="clear: both; ">const int
infrared = A4;</div><div class="separator" style="clear: both; ">const int enable = 4;</div><div
class="separator" style="clear: both; ">const int motor1Pin1 = 2;</div><div class="separator"
style="clear: both; ">const int motor1Pin2 = 3;</div><div class="separator" style="clear: both; "><br
/></div><div class="separator" style="clear: both; ">void setup() {</div><div class="separator"
style="clear: both; ">&nbsp; // Konfigurasi modul dot matrix.</div><div class="separator"
style="clear: both; ">&nbsp; lc.shutdown(0, false); // Mengaktifkan modul</div><div
class="separator" style="clear: both; ">&nbsp; lc.setIntensity(0, 8); // Mengatur kecerahan
(0-15)</div><div class="separator" style="clear: both; ">&nbsp; lc.clearDisplay(0); // Membersihkan
tampilan</div><div class="separator" style="clear: both; ">&nbsp;&nbsp;&nbsp;</div><div
class="separator" style="clear: both; ">&nbsp; // Mengatur pin-pin sebagai input atau
output.</div><div class="separator" style="clear: both; ">&nbsp; pinMode(enable,
OUTPUT);</div><div class="separator" style="clear: both; ">&nbsp; pinMode(in1, INPUT);</div><div
class="separator" style="clear: both; ">&nbsp; pinMode(in2, INPUT);</div><div class="separator"
style="clear: both; ">&nbsp; pinMode(in3, INPUT);</div><div class="separator" style="clear:
both; ">&nbsp; pinMode(in4, INPUT);</div><div class="separator" style="clear: both; ">&nbsp;
pinMode(infrared, INPUT);</div><div class="separator" style="clear: both; ">&nbsp;
pinMode(motor1Pin1, OUTPUT);</div><div class="separator" style="clear: both; ">&nbsp;
pinMode(motor1Pin2, OUTPUT);</div><div class="separator" style="clear: both; "><br /></div><div
class="separator" style="clear: both; ">&nbsp; // Memulai komunikasi serial.</div><div
class="separator" style="clear: both; ">&nbsp; Serial.begin(9600);</div><div class="separator"
style="clear: both; "></div><div class="separator" style="clear: both; "><br /></div><div
class="separator" style="clear: both; ">void loop() {</div><div class="separator" style="clear:
both; ">&nbsp; // Membaca nilai dari sensor infrared.</div><div class="separator" style="clear:
both; ">&nbsp; int infrarednya = digitalRead(infrared);</div><div class="separator" style="clear:
both; ">&nbsp;&nbsp;&nbsp;</div><div class="separator" style="clear: both; ">&nbsp; // Mengendalikan
arah motor berdasarkan nilai dipswitch.</div><div class="separator" style="clear: both; ">&nbsp;
if(infrarednya == HIGH) {</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp;
digitalWrite(enable, HIGH); // Mengaktifkan motor jika sensor infrared aktif.</div><div
class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp;&nbsp;</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp;&nbsp; // Mengecek kondisi dipswitch dan mengatur arah motor serta
menampilkan pola pada dot matrix sesuai kondisi.</div><div class="separator" style="clear:
both; ">&nbsp; &nbsp;&nbsp; if (digitalRead(in1) == HIGH & & digitalRead(in2) == LOW
& & digitalRead(in3) == HIGH& & digitalRead(in4) == LOW) {</div><div
class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp; &nbsp;&nbsp; // Jika dipswitch menunjuk ke
kiri.</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp; &nbsp;&nbsp;
digitalWrite(motor1Pin1, LOW); // Mengatur output motor untuk bergerak ke kiri.</div><div
class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp; &nbsp;&nbsp; digitalWrite(motor1Pin2,
HIGH);</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp; &nbsp;&nbsp; displayArrowLeft(); //
Menampilkan panah ke kiri di dot matrix.</div><div class="separator" style="clear: both; ">&nbsp;
&nbsp;&nbsp; }&nbsp;&nbsp;</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp; else if
(digitalRead(in1) == LOW & & digitalRead(in2) == HIGH & & digitalRead(in3) ==
LOW& & digitalRead(in4) == HIGH) {</div><div class="separator" style="clear:
both; ">&nbsp; &nbsp;&nbsp; &nbsp;&nbsp; // Jika dipswitch menunjuk ke kanan.</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp;&nbsp; &nbsp;&nbsp; digitalWrite(motor1Pin1, HIGH); // Mengatur output
motor untuk bergerak ke kanan.</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;&nbsp;
&nbsp;&nbsp; digitalWrite(motor1Pin2, LOW);</div><div class="separator" style="clear: both; ">&nbsp;
&nbsp;&nbsp; &nbsp;&nbsp; displayArrowRight(); // Menampilkan panah ke kanan di dot matrix.</div><div

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class="separator" style="clear: both; ">&nbsp; &nbsp; }&nbsp;</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp; else {</div><div class="separator" style="clear: both; ">&nbsp;
&nbsp; &nbsp; // Jika tidak ada pergerakan dipswitch, motor berhenti.</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp; &nbsp; digitalWrite(motor1Pin1, LOW);</div><div
class="separator" style="clear: both; ">&nbsp; &nbsp; &nbsp; digitalWrite(motor1Pin2,
LOW);</div><div class="separator" style="clear: both; ">&nbsp; &nbsp; &nbsp; displayLetterX(); //
Menampilkan huruf "X" di dot matrix.</div><div class="separator" style="clear: both; ">&nbsp;
&nbsp; </div><div class="separator" style="clear: both; ">&nbsp; }&nbsp;</div><div
class="separator" style="clear: both; ">&nbsp; else {</div><div class="separator" style="clear:
both; ">&nbsp; &nbsp; digitalWrite(enable, LOW); // Menonaktifkan motor jika sensor infrared tidak
aktif.</div><div class="separator" style="clear: both; ">&nbsp; </div><div class="separator"
style="clear: both; "></div><div class="separator" style="clear: both; "><br /></div><div
class="separator" style="clear: both; ">// Fungsi untuk menampilkan pola pada dot matrix.</div><div
class="separator" style="clear: both; ">void displayArrow(byte pattern) {</div><div class="separator"
style="clear: both; ">&nbsp; // Menetapkan pola pada setiap baris dot matrix.</div><div
class="separator" style="clear: both; ">&nbsp; for (int row = 0; row &lt; 8; row++) {</div><div
class="separator" style="clear: both; ">&nbsp; &nbsp; lc.setRow(0, row, pattern);</div><div
class="separator" style="clear: both; ">&nbsp; </div><div class="separator" style="clear:
both; ">&nbsp; delay(500); // Mengatur kecepatan animasi</div><div class="separator" style="clear:
both; ">&nbsp; lc.clearDisplay(0); // Membersihkan tampilan setelah menampilkan pola.</div><div
class="separator" style="clear: both; ">&nbsp; delay(500); // Jeda sebelum membaca input
lagi.</div><div class="separator" style="clear: both; "></div><div class="separator" style="clear:
both; "><br /></div><div class="separator" style="clear: both; ">// Menampilkan panah ke kanan di
dot matrix.</div><div class="separator" style="clear: both; ">void displayArrowRight() {</div><div
class="separator" style="clear: both; ">&nbsp; byte arrowRight[8] = {</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp; B00011000,</div><div class="separator" style="clear:
both; ">&nbsp; &nbsp; B00001100,</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;
B00000110,</div><div class="separator" style="clear: both; ">&nbsp; &nbsp; B11111111,</div><div
class="separator" style="clear: both; ">&nbsp; &nbsp; B11111111,</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp; B00000110,</div><div class="separator" style="clear:
both; ">&nbsp; &nbsp; B00001100,</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;
B00011000</div><div class="separator" style="clear: both; ">&nbsp; }</div><div class="separator"
style="clear: both; ">&nbsp; // Menetapkan pola panah ke kanan pada setiap baris dot
matrix.</div><div class="separator" style="clear: both; ">&nbsp; for (int row = 0; row &lt; 8; row++)
{</div><div class="separator" style="clear: both; ">&nbsp; &nbsp; lc.setRow(0, row,
arrowRight[row]);</div><div class="separator" style="clear: both; ">&nbsp; }</div><div
class="separator" style="clear: both; "></div><div class="separator" style="clear: both; "><br
/></div><div class="separator" style="clear: both; ">// Menampilkan panah ke kiri di dot
matrix.</div><div class="separator" style="clear: both; ">void displayArrowLeft() {</div><div
class="separator" style="clear: both; ">&nbsp; byte arrowLeft[8] = {</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp; B00011000,</div><div class="separator" style="clear:
both; ">&nbsp; &nbsp; B00110000,</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;
B01100000,</div><div class="separator" style="clear: both; ">&nbsp; &nbsp; B11111111,</div><div
class="separator" style="clear: both; ">&nbsp; &nbsp; B01100000,</div><div class="separator"
style="clear: both; ">&nbsp; &nbsp; B00110000,</div><div class="separator" style="clear:
both; ">&nbsp; &nbsp; B00011000,</div><div class="separator" style="clear: both; ">&nbsp; &nbsp;
B00000000</div><div class="separator" style="clear: both; ">&nbsp; }</div><div class="separator"
style="clear: both; ">&nbsp; // Menetapkan pola panah ke kiri pada setiap baris dot

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matrix.</div><div class="separator" style="clear: both;">&nbsp; for (int row = 0; row &lt; 8; row++)
{</div><div class="separator" style="clear: both;">&nbsp; &nbsp; lc.setRow(0, row,
arrowLeft[row]);</div><div class="separator" style="clear: both;">&nbsp; }</div><div
class="separator" style="clear: both;"></div><div class="separator" style="clear: both;"><br
/></div><div class="separator" style="clear: both;">// Menampilkan huruf "X" di dot
matrix.</div><div class="separator" style="clear: both;">void displayLetterX() {</div><div
class="separator" style="clear: both;">&nbsp; byte letterX[8] = {</div><div class="separator"
style="clear: both;">&nbsp; &nbsp; B10000001,</div><div class="separator" style="clear:
both;">&nbsp; &nbsp; B01000010,</div><div class="separator" style="clear: both;">&nbsp; &nbsp; B00100100,</div><div class="separator" style="clear: both;">&nbsp; &nbsp; B00011000,</div><div
class="separator" style="clear: both;">&nbsp; &nbsp; B00011000,</div><div class="separator"
style="clear: both;">&nbsp; &nbsp; B00100100,</div><div class="separator" style="clear:
both;">&nbsp; &nbsp; B01000010,</div><div class="separator" style="clear: both;">&nbsp; &nbsp; B10000001</div><div class="separator" style="clear: both;">&nbsp; };</div><div class="separator"
style="clear: both;">&nbsp; // Menetapkan pola huruf "X" pada setiap baris dot matrix.</div><div
class="separator" style="clear: both;">&nbsp; for (int row = 0; row &lt; 8; row++) {</div><div
class="separator" style="clear: both;">&nbsp; &nbsp; lc.setRow(0, row, letterX[row]);</div><div
class="separator" style="clear: both;">&nbsp; }</div><div class="separator" style="clear:
both;"></div><div><br /></div></div></div></div></div><div><div><div class="separator"
style="clear: both; text-align: left;"><b style="color: #990000; font-family: times; font-size: large;">5.
Kondisi</b><span style="color: #990000; font-family: times; font-size: large;">&nbsp;</span><a
name="video" style="color: #990000; font-family: times; font-size: large;"></a><span style="color:
#990000; font-family: times; font-size: large;"></span><a href="#home" style="font-family: times;
font-size: large;">[Kembali]</a></div></div><div class="separator" style="clear: both; text-align:
left;"><br /></div><div class="separator" style="clear: both; text-align: left;">Percobaan 5 kondisi 3
:&nbsp;&nbsp;Semua Switch pull-down, switch 1 dan 3 motor ke kiri, switch 2 dan 4 panah ke kanan dan
motor&nbsp;&nbsp; ke kanan</div><div class="separator" style="clear: both; text-align: left;"><br
/></div><span style="color: #990000; font-family: times; font-size: medium;">

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6. Video simulasi

[Kembali]</div><div style="text-align: center;"><div class="separator" style="clear:
both; text-align: center;">
</div><div class="separator" style="clear: both; text-align:
center;"><object class="BLOG_video_class" contentid="8252c7c130274512" height="266"
id="BLOG_video-8252c7c130274512" width="320"></object></div><div class="separator"
style="clear: both; text-align: center;">
</div></div><div><span style="color: #990000;
font-family: times; font-size: medium;">

7. Link Download

[Kembali]
<div><span style="font-family:
times;">Download HTML klik
disini</div><div>Download Simulasi Rangkaian <a

[klik disini](https://drive.google.com/file/d/10j1IKU1FnviO1ElspRgHWjuG7qSBlk-2/view?usp=sharing)

Download Video Praktikum

[klik disini](https://drive.google.com/file/d/1hNch-dHMZi2FH4i5RFXZ5vOxFiK1EePX/view?usp=sharing)

Download Listing Program

[klik disini](https://drive.google.com/file/d/1qEzyQTbU8mp1IAYrgzFLnB0C3YIUyU6F/view?usp=sharing)

Download Library Arduino Uno

[klik disini](https://drive.google.com/file/d/1024_4EiNdC4YnTswSji20JQP7kpXTKnv/view?usp=drive_link)

Download Library Infrared Sensor

[klik disini](https://drive.google.com/file/d/14iIJQ1HxC-jCZe-Yw-Z4SmGCjXUGbFK7/view?usp=drive_link)

Donwload Datasheet Arduino Uno

[klik disini](https://drive.google.com/file/d/1tRs15LxOaOMDtB9zWn890zYmBwfarc_Y/view?usp=drive_link)

Donwload Datasheet L293D

[klik disini](https://drive.google.com/file/d/1tNXgC6o396vAX8YfF6qX_pfVcBXIOpw/view?usp=sharing)

Donwload Datasheet Max7219

[klik disini](https://drive.google.com/file/d/1tNXgC6o396vAX8YfF6qX_pfVcBXIOpw/view?usp=sharing)

Donwload Datasheet Dot Matrix

[klik disini](https://drive.google.com/file/d/1tKpCtmwqzyZq013GpfrQ_jJo5aQhWPfy/view?usp=sharing)

Donwload Datasheet Infrared Sensor

[klik disini](https://drive.google.com/file/d/1ReDVLyIGyxWoCCR3vLq4Uzh1qXwhhAFr/view?usp=drive_link)

5.75pt 0cm 29.4pt; text-align: justify; text-indent: 14.15pt;"><span
lang="id"><o:p></o:p></p>

</div></div>

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