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<div style="text-align: center;"><a href="#"><span style="font-family: times;">[KEMBALI KE MENU  
SEBELUMNYA]</span></a></div><div style="text-align: center;"><span style="font-family:  
times;"><br /></span></div>
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<center>
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<div style="background-color: white; border: 2px dashed rgb(23, 128, 221); height: 240px; overflow:  
auto; padding: 10px; text-align: center; width: 330px;">
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<span style="font-family: times;"><b><a name="home">DAFTAR ISI</a></b>
```

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<br />
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</span><div style="text-align: left;">
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<a href="#P"><span style="font-family: times;">1. Prosedur</span></a></div>
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<div style="text-align: left;">
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<a href="#H"><span style="font-family: times;">2. Hardware dan Diagram Blok</span></a></div>
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<div style="text-align: left;">
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<a href="#R"><span style="font-family: times;">3. Rangkaian Simulasi dan Prinsip  
Kerja</span></a></div>
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<div style="text-align: left;">
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<a href="#FL"><span style="font-family: times;">4. Flowchart dan Listing Program</span></a></div>
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<div style="text-align: left;">
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<a href="#VD"><span style="font-family: times;">5. Video Demo</span></a></div>
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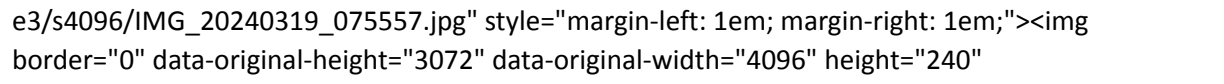
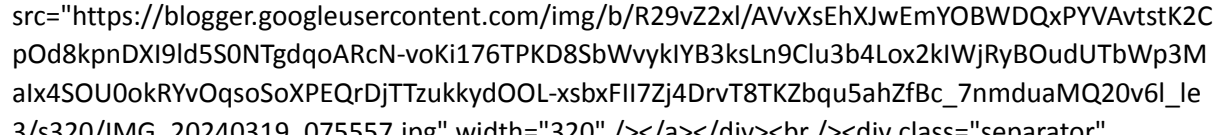
```
<a href="#K"><span style="font-family: times;">6. Kondisi</span></a></div>
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<div style="text-align: left;">
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<a href="#L"><span style="font-family: times;">7. Download File</span></a></div><div style="text-align: center;"><br /></div><div style="text-align: center;"><b>MODUL 2</b></div><div style="text-align: center;"><b>PERCOBAAN 4</b></div><p style="text-align: justify;"><b style="text-align: left;"><span style="font-family: times; font-size: small;">1. Prosedur&nbsp;<a href="#home">[Kembali]</a></span></b></p><div style="text-align: justify;"><b style="text-align: left;"><ul style="background-color: white; font-family: times; font-size: 15.4px; font-weight: 400; line-height: 1.4; margin: 0.5em 0px; padding: 0px 2.5em;"><li style="margin: 0px 0px 0.25em; padding: 0px;"><span style="border: 0px; box-sizing: border-box; margin: 0px; padding: 0px;">Rangkai semua komponen&nbsp;</span></li><li style="margin: 0px 0px 0.25em; padding: 0px;">Buat program di aplikasi arduino IDE</li><li style="margin: 0px 0px 0.25em; padding: 0px;">Setelah selesai masukkan program ke arduino&nbsp;</li><li style="margin: 0px 0px 0.25em; padding: 0px;">Jalankan program pada simulasi dan cobakan dengan modul</li><li style="margin: 0px 0px 0.25em; padding: 0px;">Lihat hasil pada motor servo dengan menekan tombol keypad&nbsp;</li></ul></b></div><div style="text-align: justify;"><b style="text-align: left;"><br /></b></div><div><span style="font-family: times; text-align: left;"><div style="font-weight: bold; text-align: justify;"><b style="text-align: left;"><span><span><a name="H">2. Hardware dan Diagram
```

[\[Kembali\]](#)

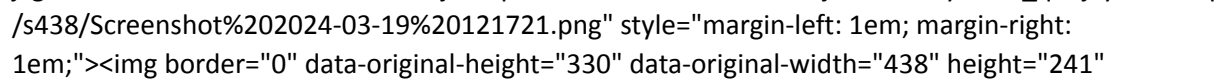
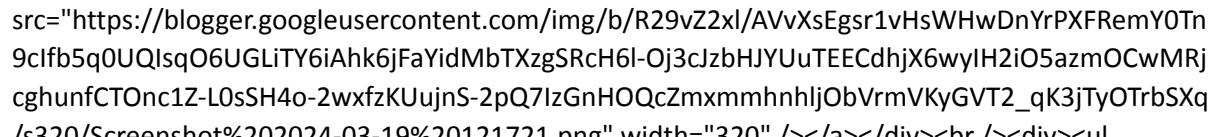
- Hardware

- Diagram Blok

3. Rangkaian Simulasi dan Prinsip Kerja
[\[Kembali\]](#)

- Rangkaian Simulasi

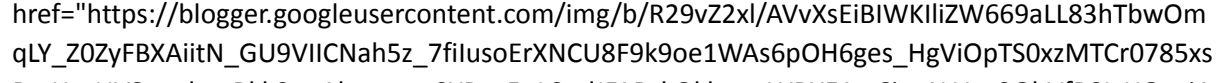
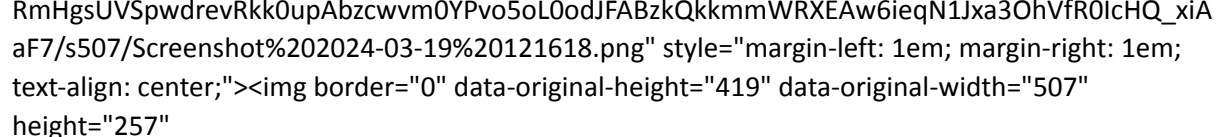



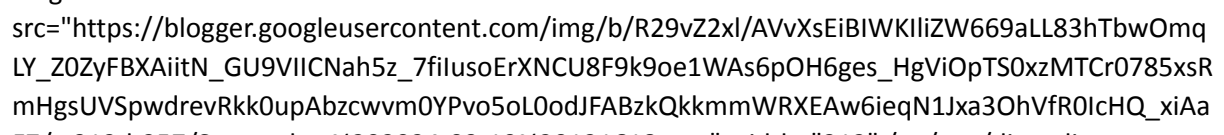
- Prinsip Kerja

Pada percobaan 4 Kondisi 1 ini diminta untuk keypad 1 hingga 9 memberikan PWM 0-180 dengan jarak PWM antar key 20. Disini kita menggunakan keypad sebagai inputan dan output berupa motor servo yang dimana seperti yang diketahui motor servo itu bergerak secara presisi berdasarkan sudutnya dengan menggunakan input berupa PWM nya. Nah percobaan kali ini kita akan mengatur sudut nya sesuai yang ada pada kondisi.

4. Flowchart dan Listing Program
[\[Kembali\]](#)

- Flowchart



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class="separator" style="clear: both; text-align: center;"><br /></div><div class="separator"
style="clear: both; text-align: left;"><ul style="text-align: left;"><li>Listing
Program</li></ul></div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;;, monospace; font-size: 14px; white-space: pre;"><span style="color:
#728e00;">#include</span> <span style="color: #005c5f;">&lt;Servo.h&gt;</span></div><div
style="color: #4e5b61; font-family: Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px;
white-space: pre;"><span style="color: #728e00;">#include</span> <span style="color:
#005c5f;">&lt;Keypad.h&gt;</span></div><br style="color: #4e5b61; font-family: Consolas,
&quot;Courier New&quot;;, monospace; font-size: 14px; white-space: pre;" /><div style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px; white-space:
pre;">Servo servoMotor;</div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;;, monospace; font-size: 14px; white-space: pre;"><span style="color:
#00979d;">const</span> <span style="color: #00979d;">int</span> servoPin = <span style="color:
#005c5f;">11</span>;<span style="color: #95a5a6;"> // PWM pin for servo</span></div><div
style="color: #4e5b61; font-family: Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px;
white-space: pre;"><span style="color: #00979d;">const</span> <span style="color:
#00979d;">int</span> numRows = <span style="color: #005c5f;">4</span>;<span style="color:
#95a5a6;"> // Number of rows in keypad</span></div><div style="color: #4e5b61; font-family:
Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px; white-space: pre;"><span
style="color: #00979d;">const</span> <span style="color: #00979d;">int</span> numCols = <span
style="color: #005c5f;">3</span>;<span style="color: #95a5a6;"> // Number of columns in
keypad</span></div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier New&quot;;,
monospace; font-size: 14px; white-space: pre;"><span style="color: #00979d;">char</span> <span
style="color: #d35400;">keys</span>[numRows][numCols] = <span style="color:
#434f54;">{</span></div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;;, monospace; font-size: 14px; white-space: pre;"><span style="color:
#434f54;">{</span><span>'1', '2', '3'<span style="color: #434f54;">}</span></div><div style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px; white-space:
pre;"><span style="color: #434f54;">{</span><span>'4', '5', '6'<span style="color:
#434f54;">}</span></div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;;, monospace; font-size: 14px; white-space: pre;"><span style="color:
#434f54;">{</span><span>'7', '8', '9'<span style="color: #434f54;">}</span></div><div style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px; white-space:
pre;"><span style="color: #434f54;">{</span><span>*, '0', '#'<span style="color:
#434f54;">}</span></div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;;, monospace; font-size: 14px; white-space: pre;"><span style="color:
#434f54;">{</span></div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;;, monospace; font-size: 14px; white-space: pre;">byte <span style="color:
#d35400;">rowPins</span>[numRows] = <span style="color: #434f54;">{</span><span style="color:
#005c5f;">9</span>, <span style="color: #005c5f;">8</span>, <span style="color:
#005c5f;">7</span>, <span style="color: #005c5f;">6</span><span style="color:
#434f54;">}</span>;<span style="color: #95a5a6;"> // Rows 0 to 3</span></div><div style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px; white-space:
pre;">byte <span style="color: #d35400;">colPins</span>[numCols] = <span style="color:
#434f54;">{</span><span style="color: #005c5f;">5</span>, <span style="color:
#005c5f;">4</span>, <span style="color: #005c5f;">3</span><span style="color:
#434f54;">}</span>;<span style="color: #95a5a6;"> // Columns 0 to 2</span></div><br style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;;, monospace; font-size: 14px; white-space:

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pre;" /><div style="color: #4e5b61; font-family: Consolas, &quot;Courier New&quot;; monospace;
font-size: 14px; white-space: pre;">Keypad keypad = <span style="color:
#d35400;">Keypad</span><span style="color: #434f54;">(</span><span style="color:
#d35400;">makeKeymap</span><span style="color: #434f54;">(</span>keys<span style="color:
#434f54;">)</span>, rowPins, colPins, numRows, numCols<span style="color:
#434f54;">)</span>;</div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;; monospace; font-size: 14px; white-space: pre;"><span style="color:
#00979d;">void</span> <span style="color: #d35400;">setup</span><span style="color:
#434f54;">(</span><span style="color: #434f54;">{</span></span></div><div style="color: #4e5b61;
font-family: Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space:
pre;"><span style="color: #d35400;">servoMotor</span>.<span style="color:
#d35400;">attach</span><span style="color: #434f54;">(</span>servoPin<span style="color:
#434f54;">)</span>;</div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;; monospace; font-size: 14px; white-space: pre;"><span style="color:
#d35400;">servoMotor</span>.<span style="color: #d35400;">write</span><span style="color:
#434f54;">(</span><span style="color: #005c5f;">90</span><span style="color:
#434f54;">)</span>;<span style="color: #95a5a6;"> // Initial position</span></div><div style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space:
pre;"><span style="color: #d35400;">Serial</span>.<span style="color:
#d35400;">begin</span><span style="color: #434f54;">(</span><span style="color:
#005c5f;">9600</span><span style="color: #434f54;">)</span>;</div><div style="color: #4e5b61;
font-family: Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space:
pre;"><span style="color: #434f54;">}</span></div><div style="color: #4e5b61; font-family:
Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space: pre;"><span
style="color: #00979d;">void</span> <span style="color: #d35400;">loop</span><span style="color:
#434f54;">(</span><span style="color: #434f54;">{</span></span></div><div style="color: #4e5b61;
font-family: Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space:
pre;"><span style="color: #00979d;">char</span> key = <span style="color:
#d35400;">keypad</span>.<span style="color: #d35400;">getKey</span><span style="color:
#434f54;">(</span>)</span>;</div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;; monospace; font-size: 14px; white-space: pre;"><span style="color:
#728e00;">if</span> <span style="color: #434f54;">(</span>key != NO_KEY<span style="color:
#434f54;">)</span> <span style="color: #434f54;">{</span></span></div><div style="color: #4e5b61;
font-family: Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space:
pre;"><span style="color: #d35400;">Serial</span>.<span style="color:
#d35400;">println</span><span style="color: #434f54;">(</span>key<span style="color:
#434f54;">)</span>;</div><div style="color: #4e5b61; font-family: Consolas, &quot;Courier
New&quot;; monospace; font-size: 14px; white-space: pre;"><span style="color: #95a5a6;">}//
Perform actions based on the key pressed</span></div><div style="color: #4e5b61; font-family:
Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space: pre;"><span
style="color: #728e00;">switch</span> <span style="color: #434f54;">(</span>key<span
style="color: #434f54;">)</span> <span style="color: #434f54;">{</span></span></div><div style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space:
pre;"><span style="color: #728e00;">case</span> '1':</div><div style="color: #4e5b61; font-family:
Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space: pre;"><span
style="color: #95a5a6;">}// Move servo to position 0 degrees</span></div><div style="color:
#4e5b61; font-family: Consolas, &quot;Courier New&quot;; monospace; font-size: 14px; white-space:
pre;"><span style="color: #d35400;">servoMotor</span>.<span style="color:

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[illegible]

[illegible]

style="clear: both; text-align: center; "><iframe allowfullscreen="" class="BLOG_video_class" height="266" src="https://www.youtube.com/embed/D-BQcFJI7BU" width="320" youtube-src-id="D-BQcFJI7BU"></iframe></div></div></div><p style="text-align: justify;"><b style="text-align: left;">6. Kondisi [Kembali]</p><div style="text-align: left;">Ketika 1 switch aktif 7-Segment menghitung mundur dari 9</div><div style="text-align: justify;">
</div><div style="text-align: -webkit-center;"><p></p><div><b style="text-align: left;"><div style="font-weight: 400; text-align: -webkit-center;"><p style="text-align: justify;"><b style="text-align: left;">7. Download File [Kembali]</p><p style="text-align: justify;">HTML klik disini</p><p style="text-align: justify;">Gambar Hardware klik disini</p><p style="text-align: justify;">Gambar Simulasi klik disini</p><p style="text-align: justify;">Video Demo klik disini</p></div></div></div></div><div style="text-align: left;">Listring Program klik disini</div></center>