



# Assignment Requirements

Each team must **propose, design, and implement** an IoT-based solution that includes:

Requirement	Description	Weight
<b>IoT Device Connection</b>	<ul style="list-style-type: none"><li>- Set up a <b>Raspberry Pi 4</b> with an <b>Azure IoT Hub</b>.</li><li>- Configure <b>MQTT communication</b> or <b>Azure SDK-based messaging</b>.</li><li>- Verify <b>data transmission</b> using <b>Azure tools</b>.</li></ul>	<b>10%</b>
<b>Sensor Data Collection</b>	<ul style="list-style-type: none"><li>- Choose at least <b>two Grove sensors</b> for monitoring (e.g., <i>temperature, motion, heart rate, light, etc.</i>).</li><li>- Write a <b>Python script</b> to collect <b>real-time data</b> and store it <b>locally</b>.</li><li>- Ensure <b>data is timestamped and logged</b> for analysis.</li></ul>	<b>15%</b>
<b>Telemetry Transmission to IoT Hub</b>	<ul style="list-style-type: none"><li>- Format sensor readings as <b>JSON</b>.</li><li>- Implement <b>secure data transmission</b> with <b>MQTT or HTTP</b> to Azure IoT Hub.</li><li>- Apply <b>error handling</b> and <b>retry mechanisms</b>.</li></ul>	<b>15%</b>
<b>Data Visualisation</b>	<ul style="list-style-type: none"><li>- Use <b>Azure Time Series Insights</b> or <b>Power BI</b> to <b>visualise sensor trends</b>.</li><li>- Display key parameters (e.g., <i>temperature history, motion activity, heart rate trends</i>).</li><li>- Ensure <b>real-time updates</b> are reflected on the dashboard.</li></ul>	<b>15%</b>
<b>Data Processing &amp; Actuation</b>	<ul style="list-style-type: none"><li>- Implement an <b>automated response</b> based on sensor readings.</li><li>- Use <b>Azure Functions</b> to <b>analyse data</b> and trigger actuations (e.g., <i>turning on a fan, sending an emergency alert</i>).</li><li>- If applicable, integrate <b>Custom Vision AI</b> for real-time decision-making (e.g., <i>recognising falls, detecting abnormal medication intake</i>).</li></ul>	<b>30%</b>
<b>Project Presentation &amp; Documentation</b>	<ul style="list-style-type: none"><li>- Submit a <b>report</b> with:<ul style="list-style-type: none"><li>- <b>System architecture diagrams</b>.</li><li>- <b>Code snippets</b> and explanations.</li><li>- <b>Screenshots</b> of dashboards and telemetry data.</li><li>- <b>Challenges faced</b> and solutions implemented.</li></ul></li><li>- Deliver a <b>5-minute demo video</b> showcasing the project.</li></ul>	<b>15%</b>