

IoT: Guidance for Final Assignment

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Objectives:

This assignment is to measures:

- To find solvable real-life problem using concept of IoT solution.
- To demonstrate the ability of group working.
- Understanding IoT components: sensors and actuators.
- Understanding basic electrical circuit.
- Applying microcontroller basic programming.
- Applying basic understanding of IoT design.
- Applying understanding on IoT framework and infrastructure.
- Applying understanding on IoT data communication and visualization.

General Format:

- PDF file based on PPT format given, make sure to not exceed the number of pages.
- Both Bahasa Indonesia or English is okay.
- Submit to Berajah before, 2025
- Font's size: minimum 20 pts for main information, can be less for any additional info, marks, and references.

Writing Format!

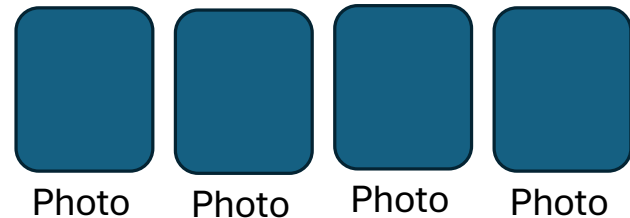
Title (Judul): put your title here (6 to 12 words)

Group Members:

No.	Name	Student ID	Role
1.			Leader
2.			Programmer
3.			Designer
4.			Etc.

Member's Responsibility

1. Leader:
 - Responsible for time management.
 - Bla bla
2. Programmer:
 - bla



Title (Judul): put your title here (6 to 12 words)

Definition (Definisi):

Shortly explain the **purpose**, **method**, and **results** of the design.

- Purpose: explain what the product can be done (after the design).
- Method: explain what components are utilized and what they do.
- Results: what's the benefits to the society (i.e. for farmers, fishermen, citizen, etc.)

Benefits (Manfaat):

Elaborate benefits into:

- **Economy**: mention and explain the economic benefits when the solution applied.
- **Social**: mention and explain its social benefits.
- **Ecology**: mention and explain its ecological benefits. Ecological benefits are benefit for environment for sustainability.

IoT Components (Komponenten IoT)

Mention and explain the components utilized in the design based on:

- Microcontroller: what microcontroller do you use
- Sensors: mention and explain
- Actuators: mention and explain
- Additional components: mention

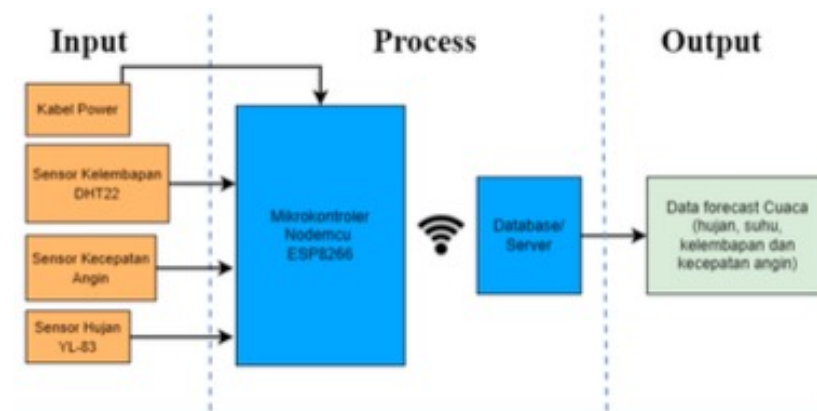
IoT Framework

- Describe IoT framework of the system. Can be differentiate as follows:
 - Custom Framework: self constructed infrastructure like:
 - HTTP – PHP, Apache – IoT framework
 - MQTT – Flask, Python – IoT framework
 - Hybrid HTTP, MQTT – Flask, Python – IoT Framework
 - Integrated IoT Frameworks:
 - Blynk
 - Arduino Cloud
- Draw logical block diagram which depicts inputs, process, and outputs of the design based on the framework you adopt.

Example on next page.

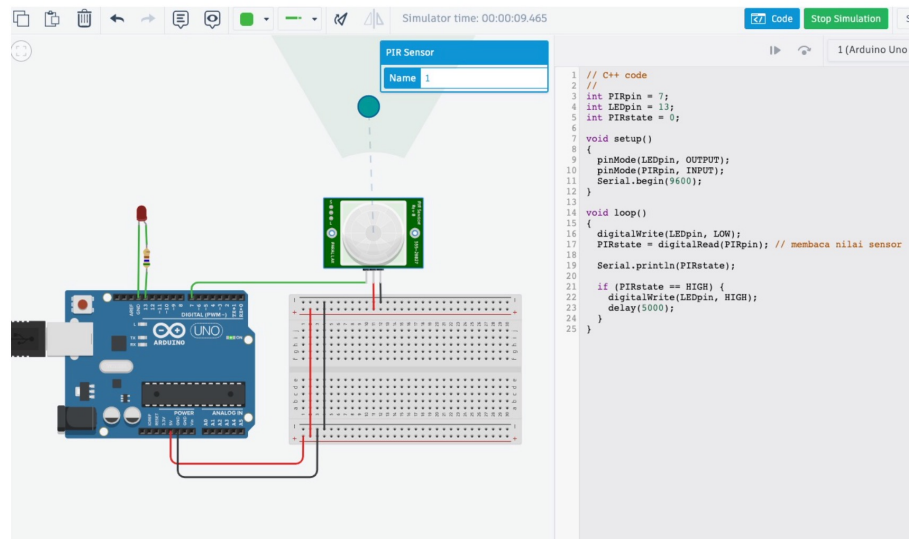
Block Diagram with IoT Framework

- Example:



Device Design:

- Show (screenshot) Tinkercad design.
- Provide clickable link to the Tinkercad design.
- Example:



- <https://www.tinkercad.com/things/3eDI6FiNijE-input-digital-arduino>
- Click the PIR Sensor and move the point to simulate motions.
- See the Serial Monitor for the change in digital input value.
- See how the LED reacts with input changes.

Design: 1 page

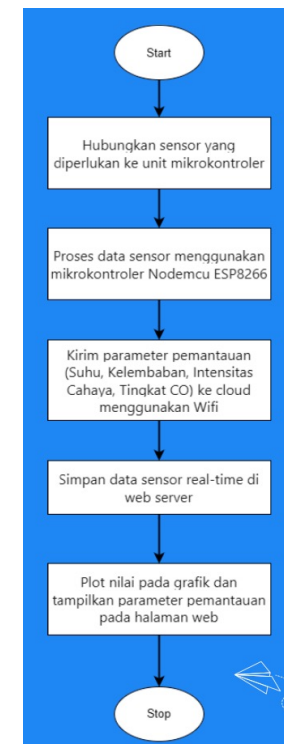
Dashboard

- Draw your IoT dashboard design here!
- Drawing includes:
 - Human - system interaction,
 - Data visualization.
- Any drawing from Bootstrap, Arduino Cloud, or Blynk dashboard designs are acceptable.

Program's Flow Chart (Flow Chart Program)

Draw the Arduino programming code's flow chart:

- Make it as simple as possible.



Program Code (Kode Program)

- Copy and explain the programming codes.
- Give code's notation when needed.
- Example:

```
1 // Lamp status from motion detection
2 //
3 int LEDPin = 7; // setting LED to port 7 - OUTPUT
4 int PIRPin = 2; // setting PIR to port 2 - INPUT
5 int PIRState = 0; // declare PIR state to 0
6
7 void setup()
8 {
9     pinMode(LEDPin, OUTPUT);
10    pinMode(PIRPin, INPUT);
11 }
12
13 void loop()
14 {
15     digitalWrite(LEDPin, LOW); // turn LED off at first
16     PIRState = digitalRead(PIRPin); // read PIR's state value
17     if (PIRState == HIGH){ // set LED ON when PIR is HIGH (motion detected)
18         digitalWrite(LEDPin, HIGH);
19         delay(60000); // delay for uninterruptable ON
20     }
21     delay(10); // Wait for 10 millisecond(s) for better loops
22 }
```

Program Code : 3 pages max

Grading Format

a. Project Grading

No.	Item	Very Good (4)	Good (3)	So so (2)	Not that Good (1)	Very not Good (0)	Credit Score (%)
A.	<i>Problem statements</i>						
1	Scope of problem	Nation wide or more	Regional or less	Family or less	Self	Not clear	
2	Manageability	Very	Enough	Quite enough	Not sure	Impossible	
B.	<i>IoT Components: sensors and actuators</i>						
3	Number	5 or more	4	3	2	1	
4	Analog and Digital IO	Analog, Digital, I, and O	1 missing	2 missing	3 missing	4 missing	

Grading Format – cont'd

No.	Item	Very Good (4)	Good (3)	So so (2)	Not that Good (1)	Very not Good (0)	Credit Score (%)
C.	IoT Design						
5	Design	Very well	Good	Enough	Not good	Very not	
6	Block Diagram	Very well	Good	Enough	Not good	Very not	
7	Flowchart	Very well	Good	Enough	Not good	Very not	
8	Codes	Complete, informative, debugable and well-structured	Complete, informative	Working but messy	Just working	Not working	
9	Framework	Hybrid Custom	MQTT Only	HTTP Only	Blynk/Arduino, etc.	Not sure	
10	Dashboard	>5 types	=< 5 types	< 5 types	<4 types	<3 types	
D.	Overall						
9	Design is working	yes	1	2	3	3 or more	25

Grading Format

b. Individual

No.	Item	Very Good (4)	Good (3)	So so (2)	Not that Good (1)	Very not Good (0)	Credit Score (%)
A.	<i>Understanding</i>						
1	Role	Project Leader	Designer, programmer,				
2							
B.	<i>Role</i>						

Thank you!
Wish you have a good result.