

LOC	Learning Outcomes: At the end of the module, you should be able to:	Question Number:
LOC 2	Display the outcome of the simulation circuit with dedicated software (P2, PLO3)	Individual Assignment 50%
LOC 3	Practice various elements, tools and technology used for building IoT applications. (A2,PLO6)	

<b>Assignment</b>	<b>Individual (50%)</b>
<b>Module</b>	<b>CT101-3-1-IIOT (APU-APD1F2309IT)</b>
<b>Assignment Title</b>	<b>Create Your Title Base on the Project</b>
<b>Date Assigned</b>	<b>Week 8</b>
<b>Date Due</b>	<b>Week 13</b>

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**Include the following information on your 1st Page.**

**Name:**

**Student ID: TPxxxxxx**

**Assignment: Project Title**

**Lecturer: Dr Kamalanathan Shanmugam**

## **Scenario**

Assume you are the trainer at AMD Institute and required to conduct training for secondary school children using an Arduino kit. Your superior instructs you to get ready for the Arduino project and instruction manual before you conduct the training.

You are free to choose your project title like Traffic light, running light, Alarm clock, security door and many others.

**What is your task?**

1. Elaborate in detail about the **uses of Arduino** in contributing to the current technologies and also **provide self-reflection**.
2. You are expected to demonstrate creativity in developing an application using Arduino that can deal with the requirements of the modern world.
3. You have to work on the prototype individually.
4. You are permitted to make assumptions where necessary. These assumptions are expected to be logical and must be appropriate for the situation at hand.
5. In **your manual you need to get step-by-step** instructions and **include pictures of your prototype of the design**.
6. There will be a presentation towards the submission date of the project. You are expected to demonstrate how your system is capable of addressing the requirements of the consumer need. Each project you develop needs do to a live demonstration or make a video to your instructor before you snap the photo for your documentation.
7. Your completed documentation should meet the following requirements:
  - Table of contents for every detailed section.
  - Introduction to Arduino and the Project your initiate
  - System Design
  - Prototype Screenshot
  - Source Code
  - Limitation
  - Future Enhancement
  - Conclusion
  - References
  - Appendices if necessary

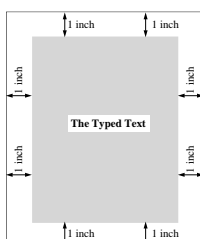
## The Assessment

This assignment will contribute 100% towards the module marks, as mentioned in the Student Assessment & Information sheet. This assignment will be evaluated based on the following criteria. Marks will be awarded based on:

<b>CLO2: Criteria</b>	<b>Weight in Percentage</b>
<b>Research and Analysis</b> Discussion and analysis of the process that takes place based on the scenario given.	25
<b>Software and Prototype running without error.</b> This includes no runtime errors, syntax errors etc. Source codes are consistent, clean, modular and follow programming logic.	50
<b>Documentation and Referencing</b> Proper documentation and references, adhering to the academic writing format as required by the university.	15
<b>Presentation</b> Demonstrating a sound knowledge and understanding of the scenario study in context.	10

## Submission requirements

1. Your report must be typed using a word processor with Times New Roman font size 12, with 1.5 spaces.
2. The report has to be well presented and should be typed. Submission of a report that is unprofessional in its outlook (dirty, disorganised, inconsistent look, varying coloured paper and size) will not fare well when marks are allocated.
3. The report should have a one (1”) margin all around the page as illustrated below:



4. Every report must have a *front cover*. A transparent plastic sheet can be placed in front of the report to protect the front cover. The front cover should have the following details: -
  - a) Name
  - b) Intake code.
  - c) Subject.
  - d) Project Title.
  - e) Date Assigned (the date the report was handed out).
  - f) Date Completed (the date the report is due to be handed in).
5. **All** information, figures and diagrams obtained from external sources **must** be referenced using the Harvard referencing system accordingly.
6. **Plagiarism** is a serious offence and will automatically be awarded **zero (0)** marks.
7. Produce the hardcopy of the above report and enclose a softcopy of the report together with the program source code in a secondary storage media.
8. You have to hand in your hardcopy assignment on time with the Course Work Submission and Feedback Form.
9. Please be informed that the presentation is compulsory and if any student refuses to attend the presentation, the grade will be considered as fail.
10. The Word count for the assignment is 2,500 words.

**Assignment marking criteria:****Performance Criteria:**

The following guidelines indicate the standard that will be expected for each grade.

**Distinction (75% and above)**

Demonstrates an excellent understanding of the IIOT concepts, uses Arduino and also justified self-reflection, the document and execution must work with the good-based program properly. The code should be implemented to a high standard of routines with necessary variables. Documentation will follow high standards with the flow of statements. The prototype needs to be discussed. Referencing and comments in the source code are very clear and follow the standard; the readability of the source code follows the W3 standard. The presentation and application demonstration are good and answers provided for any questions are completed.

**Credit (65 – 74%)**

Demonstrates a good understanding of the Arduino concepts and protocol, the presentation and documentation explain the core of the requirements with accepted level of program, main codes are expected and need to be addressed with minimum level of analysis and evaluation. Also needs to have a minimum level of self-reflection with the justification of programming languages, Document referencing and code comment is complete and the code following standards to achieve readability.

**Pass (50 – 64%)**

Demonstrate some understanding of the Arduino concepts and protocol. The code can be run with minimum defects and errors. Enough explanations for each program need to be discussed, self-reflections with justification in uses of protocol and programming languages. Documentation is adequate. The student will be able to discuss his/her program during the presentation and will be able to explain how he/she has attempted the coding concepts.

**Marginal Fail (40 – 49%)**

Demonstrate poor understanding of the problem. Presentation and explanations are limited but sufficient to demonstrate that the student understands the work that has been submitted. The program will not cover major requested requirements and the program is not able to run properly. Documentation is limited or not to an acceptable standard. The inappropriate referencing and poor source code comment.

**Fail (0 - 39%)**

Demonstrate poor understanding of the Arduino concepts and protocol, documentation incomplete and poor explanation during demonstration. The development of machine language programs is weak or incomplete, the documentation has very minimum coding and is unable to run properly. The analysis and evaluation of Arduino-level language and differences between protocols is not properly delivered. Referencing/code comments are very poor or do not have proper referencing/comments.

**The following page consists of a table of contents as a sample reference.**

## Table of Contents

<b>Introduction.....</b>	Error! Bookmark not defined.
What is IoT .....	Error! Bookmark not defined.
Arduino .....	Error! Bookmark not defined.
<b>Introduction to Project .....</b>	Error! Bookmark not defined.
Obstacle Avoidance Smart Car .....	Error! Bookmark not defined.
Main Components – Obstacle Avoidance Smart Car .....	Error! Bookmark not defined.
Ultrasonic distance sensor HC-SR04 .....	Error! Bookmark not defined.
DC Gear Motor .....	Error! Bookmark not defined.
Motor Drive Module L298N .....	Error! Bookmark not defined.
Power Switch .....	Error! Bookmark not defined.
<b>System Design .....</b>	Error! Bookmark not defined.
Components Required .....	Error! Bookmark not defined.
Basic Components.....	Error! Bookmark not defined.
Mechanical Components .....	Error! Bookmark not defined.
Components in Circuit.....	Error! Bookmark not defined.
Tools Required .....	Error! Bookmark not defined.
Building the frame of the smart car.....	Error! Bookmark not defined.
<b>Schematics Diagram.....</b>	Error! Bookmark not defined.
Motor Driver L298N as the smart car’s driver. ....	Error! Bookmark not defined.
Ultrasonic Sensors As Robot Eyes .....	Error! Bookmark not defined.
The obstacle avoidance smart car .....	Error! Bookmark not defined.
The obstacle avoidance smart car with extra LED lights. ....	Error! Bookmark not defined.
<b>Prototype Screenshot .....</b>	Error! Bookmark not defined.
<b>Video Demonstration.....</b>	Error! Bookmark not defined.
<b>Source Code.....</b>	Error! Bookmark not defined.
Ultrasonic as eyes of car .....	Error! Bookmark not defined.
Car obstacle avoidance project with LED.....	Error! Bookmark not defined.
<b>Limitation .....</b>	Error! Bookmark not defined.
<b>Future Enhancement.....</b>	Error! Bookmark not defined.
<b>Conclusion .....</b>	Error! Bookmark not defined.
<b>References .....</b>	Error! Bookmark not defined.