Assignment 1 (25%) Prototype Digital Thermometer

Due Dates

Presentation: Lab 1, **nstration:** Lab 2, Week 6 **Submission:** Sunday, Week 6

Academic Integ

This assignment is to be **lly**. Students are advised to review Monash College's policies on academic integrity, plagiarism and collusion. **Plagiarism** occurs when you attempt to use ideas or content that are not your own without proper acknowledgement. **Collusion** occurs when you work with others to complete an assessment in a way that was not authorised by teachers. In the event of suspected misconduct, the case will be reported to the relevant Head of Studies (or equivalent) and the student's unit total will be withheld until the case has been reviewed and a decision has been finalised. To avoid this:

- **Do not** share or ask for code from others. You may discuss ideas with your peers, but any solution method or material you submit must be your own.
- Any material taken **from other sources** (e.g., online, lectures, textbooks, etc) must be referenced.

Submission Guide

File submission

Your assignment file submission will consist of multiple files (code, circuit, documentation, and 3D model etc.) that are to be submitted as a single zip-file via the Moodle assignment submission box.

Your zip file is to be named **MCD1160_A1_StudentID_Name.zip** meeting the following requirements:

1. **Technical Report:**
   - A **pdf** document named *StudentID_Name_A1_Report.pdf*
   - Contains a picture of your complete Tinkercad circuit, 3D CAD Model and Technical Drawing.
2. **3D CAD Model:**
   - Exported **.ipt** CAD file named *StudentID_Name_A1_CAD.ipt.*
     See instructions on Moodle for how to transfer your model from MoVE to your computer.
3. **Tinkercad Code:**
   - Exported from Tinkercad as an **.ino** file named *StudentID_Name_A1_Code.ino*

Note: Your circuit must also be available in your Tinkercad classroom for your teacher to access. Do not modify the circuit after submitting your files as this may result in a late submission penalty.

Demonstration & Presentation

- In the **second lab class in Week 6**, you will present your design on Tinkercad and demonstrate its functionality. During this demonstration you will be expected to describe and explain its operation fully. Failure to do this will result in a reduction of your marks.
- Your presentation will take place during your **first lab class in Week 6**. During this time, you will upload a copy of your presentation to Moodle – this is a separate file submission to the files above.

Assessment Weightings

1. Design - 60% 2. Technical Report - 20% 3. Presentation - 20%

Background

Potential investors have ...any looking for a new product to invest in. They have asked you to design a prototyp... that can be carried around in your pocket. To achieve this, you need to combine seve... working circuit, develop the code to operate it, design the housing for the compon... model of the physical device.

To show that your com...e, the investors expect a detailed engineering report of each stage of the project and your analysis of your performance. You will highlight your design in a professional presentation to convince them of why your design is the greatest and deserves their investment.

Design & Report

Circuit + Code Design (10% + 30%)

Your circuit configuration and code design should meet the following minimum requirements:

- Display the temperature to an LCD screen.
- Respond to user commands via the serial monitor and via external components (e.g., pushbutton).
- Be capable of displaying the temperature in Fahrenheit, Celsius and Kelvin.
- Display the average hourly temperature.
- Use an RGB LED to show that the device is operating and that indicates the current temperature by varying both the LED colour and brightness.

3D-Model (20%)

The design of the 3D housing and assembly of the prototype device should be:

- Easily assembled, fit for purpose (i.e., is it portable and functional), and aesthetically pleasing.
- Able to hold the LCD screen, Arduino, and any other required components.
- Easily assembled and suitable for production using 3D printing technology.

Technical Report (20%)

A detailed report is required that contains the following sections:

- **Introduction:** Outlines the purpose of this project and provides a valid justification.
- **3D Design Analysis:** Present different design options and your reasons for the final design choice.
  - A hand-drawn technical drawing fully specifying your component must also be included.
- **Code Analysis:** Documents the broad code concepts used, any issues that arose during development and how you resolved these issues. Make sure to highlight anything special or unique about your approach! Do not just copy and paste your code here with no explanation!
- **Device User Guide:** Explains how to operate the device.
- **Conclusion:** Summarise the project achievements and outlines current issues and ideas for future improvement.

Presentation

Presentation Delivery (45%)

You will give a **5-minute** oral presentation describing the design process and highlighting why your prototype digital thermo[illegible]one chosen by the potential investors. The marks awarded for the presentation compo[illegible]rts:

1. Quality of **oral c[illegible]**
2. Quality of the p[illegible].g., slides, demonstrating operation) worth **5%.**

Your presentation deliv[illegible]

- Your design choices (e.g., code, 3D model, layout etc.) and justification for them.
- An outline of the design process, problems encountered and how you addressed them.
- Highlight anything unique, and the key selling points of your own design.

Presentation Material (5%)

Your presentation material should be:

- Consistently formatted.
- Clear and readable with excellent quality content.
- Flow logically from one topic to the next.

In general, your presentation can follow the structure of the technical report. The target audience for this presentation are the potential investors. Remember that you need to convince them why your device is better than anyone else's and why they should invest in you!

Marking Process

Your assignment will be graded according to the Assignment 1 rubric which is available on Moodle. Please familiarise yourself with this document and **use it as an added guide to the instructions** in this document. **You are encouraged to mark yourself before submitting with this rubric.**

In addition to the marks assessed following the rubric, the marks awarded for your code and circuit design components may be subject to change depending on your ability to demonstrate your understanding via answering questions during the workshop demonstration.

Late Submission

A 5% penalty to the final assignment grade applies for the first day the assignment is submitted late. A 2% penalty applies for each subsequent day including weekends and public holidays up to a maximum of thirteen calendar days after the due date. Assignment submitted fourteen or more days after the due date will not be accepted unless a special consideration application has been approved.

Special consideration form: monashcollege.edu.au/our-policy/policies-data/diplomas/forms-diplomas

Late penalty applied per day after assignment due date:

Day1	Day2	Day3	Day4	Day5	Day6	Day7
5%	7%	9%	11%	13%	15%	17%
Day 8	**Day 9**	**Day 10**	**Day 11**	**Day 12**	**Day 13**	**Day 14**
19%	21%	23%	25%	27%	29%	31%