Major Boss Template - Basic Info

DUE DATE: Friday 7th June

# Summary of the deliverables

In an interdisciplinary team, you are to investigate a real-life problem and identify a solution that you can design and produce with the skills you have in your team. You are to deliver:

* A digital technology **product**
* A **report** (website, presentation, video), covering the **product** and your **project** (under Project Document, see further down)

This document will take you through the necessary steps to plan, analyse, design, develop and test your product and report.

# Team Name: <Insert name here> (Our actual team name)

# Team Members: 2-4 people

|  |  |  |
| --- | --- | --- |
| # | Name | Specialty (must be related to what you have learned this semester) |
| 1 | Ben McGaw | C++ Overengineering with OOP (and a bit of hardware) |
| 2 | Ben D’Cruz | C++ and Hardware |
| 3 | Daniel Suzor | Python |
| 4 | Billy Beros | Web Dev |

Your team must cover the following required skills:

1. Coding and/or robotics
2. Web development

You must also have someone capable of producing a decent **presentation** (PowerPoint, Keynote, Prezi, etc.), or **video** (screencast, live actions, or animated), especially if you do not have a web developer.

# Communication Plan

## Communicate

How are your team planning to communicate with each other?

*Microsoft Teams*

## Collaborate

How are your team planning to collaborate with each other?

*GitHub and Microsoft Teams*

## Sharing of work

How are your team planning to share the work?

*GitHub*

## Backup of work

How are your team planning to back up the work?

*GitHub (Solves all problems)*

**It’s important that these details are worked out and the development environment is set up BEFORE any work is done!**

**The following section needs to be completed sequentially.**

Major Boss Template - Project Document

# Real-Life Inspirations

We were inspired by the U.N Sustainable Development goal #6 (Clean Water and Sanitation! Which deals with water wastage and other water and hygiene problems)FarmBot project that aimed to produce an autonomous CNC system that would plant and take care of plants using an X-Y plotter with various attachments. Now we definitely don’t have the resources to reproduce this and there isn’t really any point reinventing an open source project so we are doing a more low key version with less complexity and features.

# Overview of the major boss challenge

What is the challenge and what is your solution meant to achieve? What is the problem you’re actually trying to solve with your solution? Who will benefit from your solution? How? What are their needs?

We decided to develop an automated plant watering system based around UN sustainable goal number 6 to reduce the wastage of water when watering plants in the home. Our device will measure the moisture content of soil as well as the humidity of the air and provide the optimal amount of water so it can grow without wastage. It will make use of an Arduino Uno to run the watering algorithm with an LCD Screen and Buttons to help alter the settings. Accompanied by a Python Text Based Quiz to test people’s knowledge of the problem and challenge misconceptions. As well as a website to show off the specs and details of our product(s).

Your solution MUST AT LEAST satisfy the following MINIMUM REQUIREMENTS:

* It must make use of everyone’s specialities in a significant way.
* It must produce a report – either a website, a presentation or a video. ***All the sections under Project Document*** *must appear in that report* alongside any other information you may wish to include about the **actual product**. (This is why you must write this document carefully as you can just copy and paste its content into your report later. Just linking this Word file is NOT enough :D.)
* It must produce a “product” of digital technology (hardware or software or both but a website alone is not acceptable unless it is a “smart” or interactive website with scripts that perform some function other than displaying information, i.e. a web app).

# Specifications

In this section, you will need to create and maintain (regularly update) a **list of features** that you are planning to deliver at the end of the project.

You must also state clearly **who** has been responsible for which feature, this will encourage fair sharing of the workload and *different people may end up with different grades*.

The column for estimated **time** of completion encourages you to plan carefully. Things probably won’t turn out the way you want but at least you are aware of how much time some features may cost your team.

## Product

|  |  |  |  |
| --- | --- | --- | --- |
| # | Feature | Responsibility Of | Estimated Time Of Completion |
| 1 | Watering Algorithm | Ben2 | Week 4 |
| 2 | ESP, Sensor ,Solenoid Hard Ware | Ben | Week 2 |
| 3 | Plumbing :P | Ben2 | Week 6 |
| 4 | Controls (LCD, Pots, Switches and BUTTONS) | Ben2 |  |
| 5 | Water Quiz | Dan |  |

## Report

|  |  |  |  |
| --- | --- | --- | --- |
| # | Feature | Responsibility Of | Estimated Time Of Completion |
| 1 | Project Document (this one) | Ben2 | End of project = date? |
| 2 | Presentation | Billy |  |
| 3 | Final Prototype | ALL | Due Date (Yay Procrastinaiton) |

# Special equipment

A list of any special equipment you will need to build your product. It’s very important to negotiate with your teacher(s) to make sure these are available and reserved for your team before developing anything!

|  |  |
| --- | --- |
| Name | Planned Purposes |
| Solenoid Valve (Acquired) | Toggling Sprinklers/Watering Mechanism |
| Arduino Uno (Acquired) | Controlling Sensor and Running Watering Algorithm |
| Moisture Sensor x2 (Acquired) | Measuring soil moisture |
| DHT Sensor (Acquired) | Measuring Air Temp & Humidity |
| Irrigation Pipe and Sprinklers (Acquired) | Moving water without shorting circuitry |
| LOTS OF ADAPTERS (Acquired) | Changing form one sized pipe to another without Frying Anything |
| Relay Module (Acquired) | Toggling The Solenoid |
| 24v AC Power Supply (Acquired) | Powering The Solenoid |
| 12v DC Power Supply (Acquired) | Powering The Arduino, LCD and Sensors |

# Visual Design

In this section, you will **present the evidence of your design process**, regarding the deliverables (product and report). Before and during your actual development of the deliverables, you must use the various design techniques taught in the modules to visualise how the various components will fit together.

You will also need to include sufficient annotations (notes) in your design to help communicate your ideas amongst team members and with your teacher(s).

## Product

DESIGN 1: [TODO: A proper visualisation and description]

Eagle Circuit Diagram

DESIGN 2: [If needed, TODO: A proper visualisation and description]

FUSION DIAGRAM

## Report

WEBSITE

# Interview & Negotiation

When you reach this step, you must contact your teacher(s) to arrange for an interview. Please **email** your request to your teacher(s) with a **copy of this Word document**, completed up to this point.

Your teacher(s) will interview your team to make sure you are ready for the project. This is your opportunity to negotiate with the teacher(s) to make sure you are fully supported in what you are doing. If you need any **special equipment**, now is the time to ask for it!

You should also clarify with your teacher(s) **exactly what you will need to submit** for this project (listed in the **Development** section below and in the **Design** section above).

# Development

You are now ready to develop your product and report. Please maintain the following list of deliverables to allow your team and your teacher(s) to keep track of what you will submit.

Make sure to leave nothing out!

|  |  |  |
| --- | --- | --- |
| # | To Submit | How To Submit |
| 1 | This Word document | github |
| 2 | Moisture Manager Prototype | Give it to Mr N? |
| 3 | Code | github |
| 4 |  |  |

Generally, you will need to submit this Word document, the source files of the product and the report, in whatever form. ***Note that files larger than 100 Mb should ideally be handed in to the teacher(s) on a USB drive.***

# Testing

In this section, you will **present the evidence of your testing** of the product and the report. You may copy and paste some information from the Specifications section above.

## Product

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| # | Feature | Tested By | Passed? (Y/N) | Last Tested On | Notes |
| 1 | Measure soil moisture content | Ben2 | Y | 1st June | Works Fine |
| 2 | Water plant |  |  |  |  |
| 3 | Air Info (Humidity and Temp) | Ben2 | Y | 1st June | Works |
| 4 | Python Quiz | Ben M + Dan |  | 4th June |  |

## Report

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| # | Feature | Tested By | Passed? (Y/N) | Last Tested On | Notes |
|  |  |  |  |  |  |

# Evaluation & Reflection

Complete the Evaluation & Reflection task on Canvas. Every team member should ideally complete this before the final presentation.

# Presentation & Peer Assessment

Your team will need to present your project in front of the class. Ideally you should keep your presentation to around 5 minutes. You will need to present both your report and the product in any manner that enlightens and impresses your peers.

You should anticipate questions from your teacher(s) and the other teams.

The other teams will assess your work using **a survey and a discussion**. The average of the peer assessment results for your work will contribute up to 20% of your final result. The other 80% comes from your teacher(s).

Naturally, you will have to provide your assessment for all the other teams as well!

Check out the rubric for this challenge as well as the content of the “Major Boss Challenge” module for more details.

# Submission

To upload to Canvas (**one person per team can do this**) – make sure to hand in everything specified in the Development section above.