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Course	Computer systems engineering
Supervisor	Alexander Kalashnikov
Second marker	
Industrial Collaborator	

Project Specification Form
(3-4 pages)

1. Title

Remote web-based monitoring of brewing process

2. Background

This project brings together the work I have done from year one and year two some elements of year three and some external content too and it furthers my understanding of the work that I have done throughout my university career.

3. Aim & Objectives
(Identify the overall aim of the project and the individual measurable objectives against which you would wish the outcome of the work to be assessed.)

The main aim of this project is to produce a system that can be used to monitor the brewing process remotely from a web page via a temperature sensor and a web enabled camera.
Secondary aims of this project are:
1) To create a light source for the camera that will automatically switch on in dark environments.
2) To create an email-based update system to notify the user of impending changes that need to be made or problems that need solving

Objectives for this project are:
1) Working temperature acquisition system
2) Working webpage and video streaming system
3) Brew data displayed on webpage graphically
4) System Improvements

4. Methods / activities

Arduino parts soldered together
Arduino Code Written and working
Install and setup the Raspberry Pi's OS
Write the Python code for reading the data sent by the Arduino
Add the camera and ensure that it is enabled and functioning
Design and build the webpage for the Raspberry Pi
Add the led matrix for lighting up the camera's field of view
Write the JavaScript for the web page
Add an email server set to send emails and intervals determined by the webpage
Continuous ongoing testing throughout the project to ensure it all works
Testing

Dissertation

5. Deliverables

D1. Arduino Soldered together
D2. Working Arduino Code
D3. Raspberry Pi setup ready for the project
D4. Working Python Code
D5. Working website that has raw data displayed in plain text
D6. Working code that displays a real time graph on the website for the incoming data
D7. Live video stream on the webpage
D8. Working LED matrix with LDR to light up the camera's field of view
D9. Working email server that sends email alerts to the user so that they can monitor the system without being near it
D10. Dissertation

6. Resources

<u>Hardware</u>
Raspberry Pi 3
Arduino Pro Mini 3.3v
Soldering iron
Solder
Wiring for soldered connections
Jumper leads
Breadboard
Raspberry pi camera
DS18B20 one wire temperature sensor
2x 2k ohm resistors
SD card 8Gb or greater in size
Arduino Uno (with the micro controller removed to make a simpler way of programming the Pro Mini)

<u>Software</u>
Raspbian OS
Python terminal commands
Nano terminal text editor
Geany IDE
Arduino IDE
Putty

7. Beneficiaries

Alcohol brewers from hobbyists to industrial level companies this system could be used for other temperature monitored processes within the operating range of the DS18B20 temperature sensor

8. Risks/Hazards

Completed a separate Risk Assessment form

9. Work plan

Name	Begin date	End date
solder arduino parts t...	15/10/18	15/10/18
Write code for arduino	16/10/18	29/10/18
Install and setup the r...	30/10/18	07/11/18
write python code for ...	08/11/18	16/11/18
Add camera	19/11/18	27/11/18
Design webpage for ra...	28/11/18	17/12/18
Add light source	18/12/18	28/12/18
write java for web page	31/12/18	29/01/19
Add email	30/01/19	27/02/19
Testing	30/10/18	21/03/19
Take notes for disserta...	15/10/18	21/03/19
Write dissertation	04/03/19	26/04/19