

Sub.	Re-Sub

## Assignment Brief Submission&Resub

LOs	LO3		
Grade " Sub"			
Grade "Resub"	P		Not Achieved " repeat unit"
Student Name:			ID Number
Unit Number and Title:	ICT	Embedded System	
Qualification	High National Diploma in ICT		
Academic Year:	2021/2022	Assessor Name	Dr. Ahmed Fares
Assignment Title	Greenhouse	Internal Verifier Name	Dr. Ghada Maher
Assignment No.	2	Issue Date	22/05/2022
Submission Format Type of Evidence	Report	Submission Date	30/05/2022

## STUDENT DECLARATION

### Plagiarism

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalised. It is your responsibility to ensure that you understand correct referencing practices. As a university level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

### Student Declaration

#### Student declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

Also, I acknowledge that I have received the feedback about my work from the assessor.

Student signature:

Date: / /2021

### FORMATIVE FEEDBACK

Assessor's Formative Feedback:

Confirm action completed:

Assessor Signature:

Date:

IV assessment brief approval

IV's signature: Ghada Maher

Date: 21 / 05 /2022

Learning Outcomes and Assessment Criteria:			
Learning Outcome	Pass	Merit	Distinction
<b>LO3 Write well-structured code in an appropriate programming language, to simulate, test and debug it</b>	<b>P5</b> Write well-structured working code, to meet an identified need <b>P6</b> Test and debug code through simulation in the hardware, demonstrating functionality	<b>M4</b> Adapt and improve given examples to produce well-structured and reliable code with meaningful program identifiers, to meet an identified need	<b>D1</b> Critically evaluate the code developed through simulation and in the hardware, demonstrating excellent functionality

### Scenario

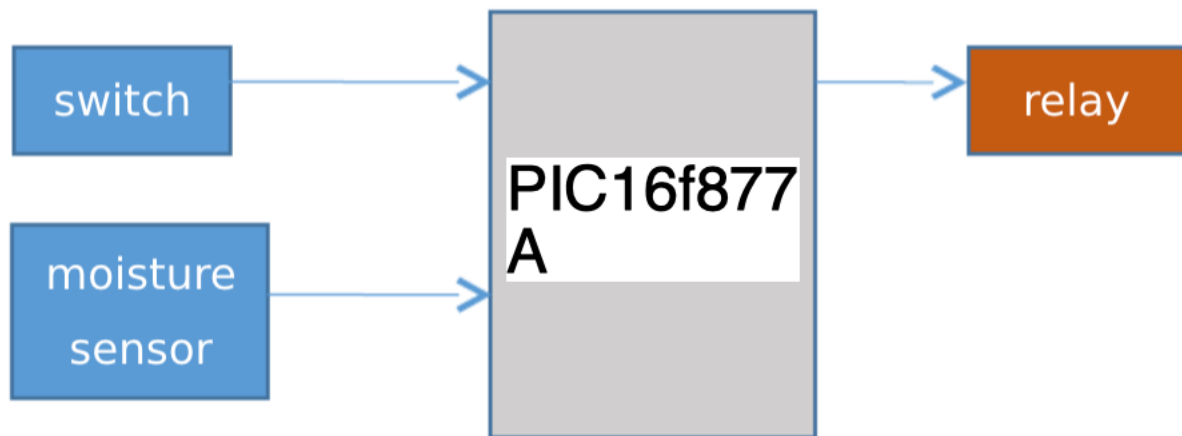
Embedded systems are found almost everywhere; look around you and you will find many of them in your room, for example: your digital watch, your mp3 player, your digital camera, your TV remote control, and even inside your PC; even if you decide to go to your kitchen, you will find them in your microwave oven, your refrigerator, your washing machine, your cooker, and many many others. Moreover, Embedded systems can be classified as real-time and non-real-time, tied with deadlines or not, respectively.

To be an embedded **technologist** and work in such a field. In company, you are assigned to prepare a prototype of **greenhouse** control system. It is your responsibility to code the program for the system. In task 1 and 2, you must build a prototype **without internet connection**.

### Task1

We demonstrate a soil irrigation sub-system for green house. That sub-system will be controlled either in manual mode (with switch) or automatic mode (with soil moisture sensor). Digital Inputs, Digital Outputs and Analog Inputs of PIC16f877A will be used.

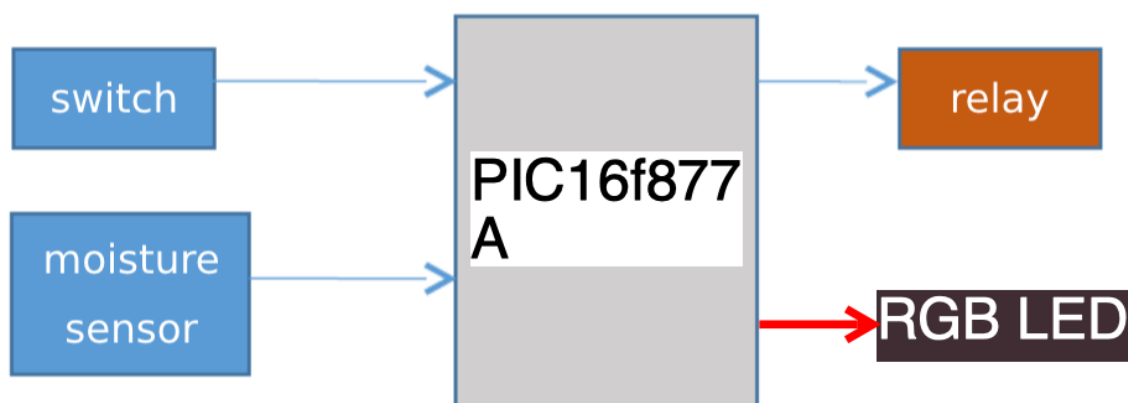
- The manual mode has higher priority level than the automatic one,
- If the moisture of soil is below a threshold, the pump (relay) will be turned on. Suppose that you know which threshold is appropriate to your plant,



1. **Code** the PIC and demonstrate at the end of assignment deadline.
2. **Implement** the circuit for the whole system.
3. **Provide** flowchart (software diagram [4]) of your code. Add comments to code lines.
4. **Show** evidence of your debugging activities, each time the system did not work as expected.
5. **Adapt** the code to produce well-structured and reliable code.
6. **Evaluate** the previous system correctness and speed.

### Task2

To complete the green house prototype, you will use a PWM to control the lighting of RGB LEDs, with an appropriate color (spectrum) to the plants and adjust the intensity according to the periodic pattern suggested.



1. **Code** the PIC and demonstrate at the end of assignment deadline.
2. **Implement** the circuit for the whole system.
3. **Provide** flowchart of your code.
4. **Show** evidence of your debugging activities, each time the system did not work as expected.

#### **References and sources of information**

- John Catsoulis, **Designing Embedded Hardware**, 2005.
- Qing Li and Carolyn Yao, **Real-Time Concepts for Embedded Systems**, 2003.
- Michael Barr, **Programming Embedded Systems in C and C++**, 1999.
- Rob Toulson and Tim Wilmshurst (2017), **Fast and Effective Embedded System Design**, Newnes, Chapter 6 pages 112-115.

# Higher Nationals - Summative Assignment Feedback Form

Student Name		Student ID	
Unit Title	Embedded System		
Assignment Number (1 of 2)	2	Assignment Title	Greenhouse
<p><b>Assessor Summative Feedback:</b> Feedback should be against the learning outcomes and assessment criteria to help students understand how these inform the process of judging the overall grade. *Should be constructive and useful including:</p> <ul style="list-style-type: none"> <li>- Feedback should give full guidance to the students on how they have met the learning outcomes and assessment criteria</li> </ul> <p>a) Strengths of performance</p> <p>b) Limitations of performance</p> <p>c) Any improvements needed in future assessments</p>			
Assessor Signature: Dr. Ahmed Fares		Date:        /        /2022	
Re-submission Date	/      /2022	Actual Date Received Re-submission	/      /2022
<p><b>Resubmission Feedback:</b></p> <p>*Please note resubmission feedback is focussed only on the resubmitted work</p>			
Assessor Signature:		Date:        /        /2022	
Internal Verifier's Comments:			
Signature:		Date:        /        /2022	

\* Please note that grade decisions are provisional. They are only confirmed once internal and external moderation has taken place and grades decisions have been agreed at the assessment board.