WARWICK

SCHOOL OF ENGINEERING

Module Code:
ES2C4

Module Title:
Computer Architecture and Systems

Learning Activity:
Lab 1 Introduction to C Programming

Learning Objectives:

- **Setup the Visual Studio Code**
- **Write C programs with pointers, arrays and loops**

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1. Introduction

The C programming language was introduced in Lecture 1. Lectures 2 - 3 covered some features of a C program including statements, loops, pointers, arrays and strings. The exercises in Section 3 were designed to help you become more familiar with these features of the language.

The Visual Studio Code editor will be used for the C programming labs. Section 2 will present links to resources that will help you set up the Visual Studio Code editor. You could also use any other source code editor or IDE you are already familiar with including Xcode, Atom, Notepad ++ etc.

2. Visual Studio Code

Visual Studio Code is a lightweight but powerful source code editor which runs on your desktop and is available for Windows, macOS and Linux. If you are already familiar with Visual Studio Code and already have a C compiler installed then you can skip this section.

Resources:

- Setup for Linux, macOS, Windows
- Introductory videos
- The user interface
- GCC compiler for Linux, Windows
- Clang compiler for macOS

3. C Programming Basics

Complete the following programming exercises. Use the concepts presented in the lectures and practical demo videos.

a) Declare 4 variables, initialise them with the data below and print them to the console:
   (i) Your student ID number (global variable).
   (ii) The first letter of your first name (local variable).
   (iii) The first letter of your last name (local variable).
   (iv) The result of 9/5 (local variable).

b) Create a pointer for each of the variables above. Using the pointers, change the value of the variables above to the following:
   (i) The last 4 digits of your student ID.
   (ii) The last letter of your first name.
   (iii) The last letter of your last name.
   (iv) The result of 16/7.
   (v) Print the new variable values using the pointers.

c) Write a C program to:
   (i) Compare two numbers and prints the larger number to the console. Print “Both numbers are equal.” If the numbers are equal.
   (ii) Find the sum of even numbers between 25 and 91 and prints the result.
   (iii) Find the sum of the decimal equivalent of the ASCII characters in your name using a loop.
   (iv) Generate an array of 20 numbers where each successive number is a sum of the proceeding numbers in the array. The first number in the array should be 7. Print all elements in the array.