ENGG1003 - Lab Week 8

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1 Introduction

This lab covers the three topics which will be assessed during the Week 9 assessed lab. It includes:

- Functions which accept pointer arguments
- Multi-Dimensional arrays
- File I/O

2 Pointers

Task 1

(Basic "toy" example)

Write a C function which takes a single `int *` argument and zeros it. The function prototype is:

```
void zeroInt(int *x);
```

Write your own "test code" to verify the function's operation.

Task 2

Write a C function which accepts two arguments of type `int *` and swaps them. The function prototype is:

```
void swap(int *a, int *b);
```

Write your own "test code" to verify the function's operation.

Task 3

Write a C function which accepts three `int *` arguments, assigns the mean of the three numbers to the first argument and zeros the others. The function prototype is:

```
void mean(int *a, int *b, int *c);
```

Write your own "test code" to verify the function's operation.

3 Multi-Dimensional Arrays

Task 4

Using the template below, write a C program which calculates the mean of the initialised 2D array and prints the result to the console.

```
#include <stdio.h>

main() {
   float myArray[3][3] = { { 0.1, 0.2, 0.3 }, { 1.1, 1.2, 1.3 }, { 2.1,
    2.2, 2.3 } };
}
```

4 File I/O

Task 5

Write a C program which initialises a 2D array with data in a file. The file's contents is:

```
12 31 35
23 5 43
434 63 64
```

Create a file and copy the contents above into it. The filename can be anything of your choosing.

Use array indexing in the format: `arrayDame[row][column]`.

After reading the data, find the largest number in the 2D array and print its value and indices (ie: location or address within the array).

You may use the following template:

```
#include <stdio.h>

main() {
   int arrayData[3][3];
   FILE *input;

   // Open the file

   // Read the data from the file into arrayData

   // Find the largest value, print it, and it's indices
}
```