

# Lab Five

ID1303: Introduction to Programming

1. Complete exercises from previous sessions.
2. Add the following function declaration to myString.h (code shared), write its definition in myString.c and test this function.

```
int isSubstring(char string1[],char string2[]);
```

If string1 is a substring of string2, then the function should return the first index (position) of string1 in string2; otherwise it should return -1. For example, if string1 is STA and string2 is CRYSTAL, then the function should return 3.

3. Write a header file called vector.h with the following declarations.

```
void vectorRead(float num[],unsigned int dimension);
```

```
void vectorPrint(int num[],unsigned int dimension);
```

```
float vectorLength(float num[], unsigned int dimension);
```

```
float vectorDotProduct(float num1[],num2[],unsigned int dimension);
```

(a) You can guess what these functions should do; write their definitions in a file called vector.c.

(b) Create an object file from vector.c.

(c) Test these functions with a file called vectorTest.c and compile it along with vector.o.

(d) Create a makefile for vectorTest.c (see makefile2). To run the makefile, simply type make in your terminal. The makefile is executed from "bottom-up". The lines above each command indicate the target and source files.

4. Create a 3D array (of any type) size  $2 \times 3 \times 4$  and print the addresses of all the array elements.
5. Create an integer variable num and two variables ptr1 and ptr2, both containing the address of num. Use ptr1 to change the value of num and display the value using ptr2.

The remaining programs are optional. Try as many as you can.

6. Write a program that accepts values in two integer variables and swaps their values.
7. Write a function with the following declaration.

```
void reverseArray(int num[],int left, int right);
```

The function should reverse the elements of the array passed to it in the range  $[left, left + 1, \dots, right]$ .

For example, if the array is  $\{1, 2, 3, 4, 5, 6, 7\}$ , calling `reverseArray(num,2,4)` will yield the array  $\{1, 2, 5, 4, 3, 6, 7\}$ .

8. Write a recursive function to compute the  $n$ th Fibonacci number.
9. Write a function that accepts an input string (including spaces) and then removes all the spaces. For example, if the input is "One two three", the output should be "Onetwothree".