Australian National University

# Arrays

Eric McCreath

# Introduction

Arrays are index from 0 to n-1 where n is the number of elements in the array.

Arrays use pointers to index elements. Note that, the type of the pointer will determine the size of the elements in the array.

```
int array[5]; // declaring an integer array of 5 elements
array[0] = 7;  // setting the first element in this array
printf("%d", array[1]); // print the second element of the array
```

# Initializing Arrays and 2D arrays

You can set arrays to an initial set of values.

```
double float_array[] = {3.1,7.5,8.8};
```

You can also create 2D arrays:

```
double matrix1[3][3];
```

These can also be initialized:

```
double matrix2[][] = {{1.0,0.0},{0.0,1.0}};
```

# Finding the length of an array

You can use sizeof to determine the number of bytes an initialized array takes up. So you could divide this size by the size of each element to work out the number of elements in an array. However, this approach will not work if you have an array that you pass as a parameter (remember arrays are just pointers).

```
int data[10];
datalength = sizeof(data) / sizeof(int);
```

Avoid this approach. You should know the length of an array independently from the array itself.

# Exersizes

- Write a program that loads a list of integers form standard input into an array and that finds the maximum and minimum values from this array.
- Write a program that does basic operations on 3x3 matrixes included addition and multiplication.