

Arrays

INFS1609/COMP1400 – Week 4
Section 4.1.6 in Barnes and Kölling textbook

Grouping Data

- An array is a group of elements that all have the **same** type
- Objects group elements of **different** types

Objects

```
class Student
{
    int studentID;
    String studentName;
    int mark;
    ...
}
```

Accessing Elements

- Array elements are accessed by their position in the array
- Object fields are accessed by name, e.g.
`Student fred = new Student();`
`fred.studentID = 3412345;`
- We'll come back to this later in the semester

Creating Arrays

- Type declaration
Eg. `int[] data;`
 - type of array element (points to `int`)
 - indicates array type (points to `[]`)
- Declares an array of integers
variable name (points to `data`)

Creating Arrays

```
// Create an integer array  
// with five elements  
int[] intArray = new int[5];
```

Creating Arrays

```
// Create an array of floats  
// with ten elements  
float[] floatArray = new float[10];
```

Creating Arrays

```
// Create an array of Strings  
// with ten elements  
float[] strArray = new String[10];
```

Creating Arrays

```
// Create an array of Students
// with ten elements
Student[] stuArray = new Student[10];
```

Accessing Array Elements

- For an array of length n
- array elements are numbered 0 to $n-1$
- e.g.

`data[0]` is the first element

`data[1]` is the second, etc



Accessing Array Elements

- Trying to access an element outside the range 0 .. $n-1$ results in an error

Initialising an Array

```
// Initialise array
int[] test = {5, 2, 7, 9, 4, 6, 8};
```

Array Indexing

- The index expression can be anything that yields a non-negative integer

```
data[i+1]
```

```
data[intArray[i]]
```

- HINT: you can use this in the assignment