Strings

Strings are a useful feature of the C++ language that is not available in C

Strings

- In C++ as in C strings may be handled as null-terminated arrays of characters
- The Standard C++ Library includes a String class which greatly simplifies the use of character strings.
- To use strings (or any other Standard Library class):
  - The appropriate header file must be included

    ```
    #include <string>
    ```

    (NOTE NOT **string.h –** this gives C functions **strcmp(), etc)**
  - The following directive (or a variant) must be used:

    ```
    using namespace std;
    ```
  - Strings may now be declared just as are the built-in types:

    ```
    string str1;
    ```

    or

    ```
    string str2 = “This is an initialisation”;
    ```

Operations on strings (1)

- A very large number of operations are defined for strings. Some of the most important are:

  – *Assignment* – a standard string, a C-style string or a single character may be assigned to a string.

```
string str1, str2, str3;
char cStr[] = “A constant string”;

str1 = cStr;
str2 = str1;
str3 = “Another constant string”;
str1 = ‘c’;
```

Operations on strings (2)

- *Concatenation* – strings can be concatenated by use of the ‘+’ or the ‘+=“ operator.

```
str3 = str1 + str2;
str3 = str1 + “more string”;
str3 = “another string” + str2 + ‘?’;

str3 += str1;
str3 += ‘!’;
str3 += “some more stuff”;
```

- *Individual characters* can be accessed or changed by indexing.

```
str1[3] = ‘$’;
char ch = str1[6];
```

- *As with C, there is no subscript range checking.*
  An out-of-range subscript gives unspecified results

Operations on strings (3)

- Length of a string may be found by:

```
int length = str1.length();
```

- Lexical comparison of two strings uses the operators **==, !=, >, >=, <, <=** , e.g.:

```
if(str1 == str2) . . . .
```

- Strings may be output to the screen by:

```
cout << str1;
```

  or input from the keyboard by:

```
cin >> str1;
```

(As with input into a char array, leading white space is ignored and trailing white space terminates the operation.)

Operations on strings (4)

- There are a number of other operations available for strings. These include operations to:
  - Insert one string into another.
  - Find the position of a sub-string within a string.