

## 31251 Data Structures and Algorithms

### Workshop 1

#### Preparation

Go through learning module 1, studying the material contains in each of its sub-modules. Do each of the quizzes in the sub-modules and the final module quiz. Make sure you understand the questions and the answers.

Go through the problems below and prepare solutions to be brought to the workshop.

#### Problem 1

A program is written to ask for three inputs.

1. Diamond size.
2. Diamond border character.
3. Diamond fill character.

Diamond size must be an odd number  $> 0$ . Running the program will cause a diamond to be printed to the screen.

##### Example 1

Please enter size: 3

Please enter border: \*

Please enter fill:

In the last item a space has been entered as the fill character. This will print the following diamond on the screen.

```
#
# #
#
```

##### Example 2

Please enter size: 5

Please enter border: #

Please enter fill: +

This will print the following diamond on the screen

```
#
##+
#+++#
##+
#
```

If the user enters an invalid diamond size the programs exits displaying an error message.

Create a C++ program, broken up into suitable functions, to do this

## **Problem 2**

Devise a set of tests to thoroughly test the program.

Note: Please read the Functionality menu item on SUBNET for how to do this.