

## 31251 Data Structures and Algorithms

### Workshop 3

#### Preparation

Go through learning module 3, 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

An animal has a class name (mammal, reptile, etc), genus and species name (can contain more than one word).

Zoo stock contains animal data plus the stock ID (6 digit number), sex of the animal (m/f) and enclosure pen (single capital letter + two digit number, eg D07) it is in.

A zoo class contains an array of stock items. It also has a number of associated functions

```
// utility functions
int numStock() const;
int numClass(char *classname) const;
int numPen(char *pen) const;

// file functions
bool saveZoo(const char *filename) const;
bool loadZoo(const char *filename);
```

The files will have the following format

Number of stock

Stock ID

Stock sex

Stock pen

Animal class

Animal genus

Animal species

Repeat for every stock in the zoo

loadZoo carefully checks the file when loading it to make sure it is valid and not corrupted.

I have included a file called testzoo.cpp that will use command line arguments to load a zoo file into a zoo class, run the utility functions and then save the zoo to another file. Eg

testzoo stockfile1.txt stockfile2.txt

which will load the contents of stockfile1.txt, display some results and then save it to stockfile2.txt.

I have also included an example stock file. On the rerun server I have placed a compiled version of the program for you to play with.

You will need to start a terminal session and then type

```
ssh -l your_login_name rerun.it.uts.edu.au
```

your\_login\_name is NOT your student number. If you don't know your login name you can find it by going to.

`https://start.it.uts.edu.au/reset`

You will be asked for your password to log into rerun. Then type

`/home/glingard/testzoo stockfile1.txt stockfile2.txt`

to run the program. You will need to supply a stockfile.

Devise the classes and class functions needed to implement this program. You should start coding it. Be warned; the file loading can be tricky so give yourself time 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.