

## 91.102 : Exercise 3

Read

- Section 7.4 through Section 7.4.2

in Esakov and Weiss and do the following tasks.

1. Make a new directory, called ex3, for this exercise. Always make a new directory for every exercise as you may need work that you have previously done later in the course.
2. Copy the Makefile and globals.h from the previous exercise.
3. Type “make headers” at the prompt. If you get an error, fix it promptly.
4. Open a new file called heap.h in you favorite text editor and add the necessary pre-processing directives for preventing multiple inclusions.
5. Then add a pre-processing directive to include the file globals.h in heap.h.
6. Then add the following type definition.

```
typedef struct heap heap;
```

7. Then add the following procedure declarations. Make sure they follow the type definition.

```
extern status init_heap(heap * const p_H);

extern bool empty_heap(heap * const p_H);

extern status heap_insert(heap * const p_H,
                        generic_ptr const data,
                        int (*p_cmp_f)(generic_ptr, generic_ptr));

extern status heap_delete(heap * const p_H,
                        unsigned int index,
                        generic_ptr * const p_data,
                        int (*p_cmp_f)(generic_ptr, generic_ptr));

extern status destroy_heap(heap * const p_H,
                        void (*p_func_f)(generic_ptr));
```

Type “make headers” at the prompt. If there are any errors, fix them before proceeding.

8. Hand in your code using Bottlenose. Make sure to review the instructions for using Bottlenose on the course webpage.
9. If you had any problems with the assignment write out an explanation of the problems you encountered and hand the explanation in at the start of the next class period following the due date of the assignment.