

## 91.102 : Exercise 2

Read

- Section 5.8

in Esakov and Weiss and do the following tasks.

1. Make a new directory, called ex2, 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 queue.h in your 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 queue.h.
6. Then add the following type definition.

```
typedef struct queue queue;
```

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

```
extern status init_queue(queue * const p_Q);  
  
extern bool empty_queue(queue const Q);  
  
extern status queue_add(queue * const p_Q,  
                        generic_ptr const data);  
extern status queue_remove(queue * const p_Q,  
                           generic_ptr * const p_data);  
  
extern status destroy_queue(queue * const p_Q,  
                            void (*p_func_f)(generic_ptr));
```

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

8. Make a new file called `queue_utils.h`. Add the three pre-processor directives you always need to add. Then add the following code.

```
#include "queue.h"

extern status peek(queue * const p_Q,
                  generic_ptr * const p_data);
```

Type “make headers” and fix any errors that you encounter.

9. Hand in your code using Bottlenose. Make sure to review the instructions for using Bottlenose on the course webpage.
10. 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.