

Name _____

Student number _____

CS 2SC3 and SE 2S03 Fall 2008

Quiz 8 Answer Key

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You have 10 minutes to complete this quiz consisting of 2 pages and 5 questions. You may *not* use your notes and textbooks, nor may you use any calculators or other electronic devices. Circle the *best* answer for the multiple choice questions, and write the answer in the space provided for the other questions. Good luck!

- (1) [2 pts.] There is a heap memory deallocation operator in both C and OCaml. Is this statement true or false?
 - (a) True.
 - (b) False.
- (2) [2 pts.] Which of the following is an example of a dynamic data structure?
 - (a) Record.
 - (b) Array.
 - (c) Linked List.
 - (d) String.
- (3) [2 pts.] Which kind of memory is automatically allocated and deallocated in both C and OCaml during run time?
 - (a) Static memory.
 - (b) Stack memory.
 - (c) Heap memory.
 - (d) All of the above.
- (4) [2 pts.] Assume the following type definition has been made in C:

```
typedef struct {  
    float x;  
    float y;  
} rec;
```

Write a piece of C code that (1) declares a pointer named `p` of type `rec *`, (2) allocates memory from the heap for a value of type `rec`, and (3) stores the address of this memory in `p`.

Answer:

```
rec * p = malloc(sizeof(rec));
```

(5) [2 pts.] In a sentence or two, explain what a *memory leak* is?

Answer: A memory leak is a reduction of the memory available to a program that occurs when the program fails to deallocate heap memory when it is no longer needed.