

CMSC330 Spring 2011 Quiz #3

Name _____

Discussion Time (circle one): 9am 10am 11am 12pm 1pm 2pm

Instructions

- Do not start this test until you are told to do so!
- You have 15 minutes for this quiz.
- This is a closed book exam. No notes or other aids are allowed.
- For partial credit, show all of your work and clearly indicate your answers.
- Write neatly. Credit cannot be given for illegible answers.

1. (12 pts) OCaml

- a. (4 pts) Give the type of the following OCaml expressions, or write “ERROR” if there is none. Here `map` refers to the standard curried list-processing function that was covered in class (and is also implemented in the `List` module).

`fun x y -> x (y+1)` **Type =**

`map (fun x -> 2*x)` **Type =**

- b. (2 pts) Write an OCaml expression (not a declaration!) with the following type

`(bool -> int) -> int` **Code =**

- c. (6 pts) Write a function `rmZeros` that, given a list of integers, returns the same list except with all occurrences of 0 removed. For example, `rmZeros [1;0;2;0]` should return `[1;2]`.

2. (4 pts) Scope rules

Consider the following OCaml declarations.

```
let x = 0;;  
let f y = x;;
```

The following questions refer to the expression `let x = 1 in f x`

- a. (2 pts) Under OCaml's usual static scoping rules, what is the value of the expression?
- b. (2 pts) Now suppose OCaml uses dynamic scoping instead. What would the value of the expression be?