CMSC 330 (Spring 2017) Quiz 2

Name (as it appears on GradeScope): _____

Discussion Time (circle one): 10am 11am 12pm 1pm 2pm 3pm

Discussion TA (circle one): Aaron Alex Austin Ayman Daniel Eric

Greg Jake JT Sam Tal Tim Vitung

Instructions:

Do not start this quiz until you are told to do so.

You have 15 minutes for this quiz.

This is a closed book quiz. No notes or other aids are allowed.

For partial credit, show all of your work and clearly indicate your answers.

1. (2 points each) Give the type of the following OCaml expressions.

a. `(1.1,[5 < 2; false])`

b. `fun f a b -> f (b, a)`

c. `fun f -> (f 0.3) = 1`

2. (2 points each) Give OCaml expressions with the following types *without* using type annotations.

a. `(int * bool) list`

b. `('a -> 'b) -> 'a -> ('a * 'b)`

```
let rec map f xs =
  match xs with
  | []      -> []
  | x :: xs -> f x :: map f xs

let rec fold f v xs =
  match xs with
  | []      -> v
  | x :: xs -> fold f (f v x) xs
```

3. (10 points) Write a function `check_rows : bool list list -> bool` that takes a list of lists of booleans `xss` as argument, and returns true iff every list `xs` in `xss` contains the value `true`. The inner and outer lists can have any length. You are encouraged but not required to use `map` and `fold` for this question. You are not allowed to use imperative features of OCaml. As always, you are allowed to define helper functions.

```
check_rows [] = true
check_rows [[true];[]] = false
check_rows [[true];[false]] = false
check_rows [[true;false];[false;false;true]] = true
```