

CMSC 330, Spring 2018 Quiz 1

Name **SOLUTION**

Discussion Time (circle one)	10am	11am	12pm	1pm	2pm	3pm			
Discussion TA (circle one)	BT	Daniel	Chris	Alex	Derek	Pei-Jo	Akbar	Justin L.	
	Tal	Shriraj	Cameron	Eric	Kesha	Kameron	Michael S.	Michael P.	

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 your work and clearly indicate your answers.

1. (2 points each) Give the type of the following OCaml expressions. If there is a type error, explain it.

(a) `[1;2]::[3;4]`

error, the cons operator (::) cannot be used to concatenate two lists. The type of the cons operator is 'a -> 'a list -> 'a list

(b) `let x = 5 in (true, x)`

bool * int

(c) `fun x y -> if x = y then x else y`

'a -> 'a -> 'a

(d) `fun f x y -> (f x)::y`

('a -> 'b) -> 'a -> 'b list -> 'b list

2. (2 points each) Give an OCaml expression of the following types.

(a) `int * (string list)`

(1,["foo"]) (many answers possible)

(b) `int -> int -> int`

fun a b -> a + b (many answers possible)

(c) `'a -> 'b -> ('b * 'a) list`

fun a b -> [(b,a)] (many answers possible)

3. (3 points each) What is the value of the following OCaml expressions?

```
(a) let rec f1 l a =  
    match l with  
    | [] -> a  
    | h::t -> f1 t (h::a)  
in f1 [1;2;3] [7]
```

[3;2;1;7]

```
(b) let rec f2 l =  
    match l with  
    | [] -> []  
    | [h] -> [h*5]  
    | h::t -> (h*2)::(f2 t)  
in f2 [1;2;3;4]
```

[2;4;6;20]