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## CS 2SC3 and SE 2S03 Fall 2008

### Quiz 6 Answer Key

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You have 10 minutes to complete this quiz consisting of 2 pages and 4 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) [1 pt.] The use of goto statements is usually considered poor programming style. Is this statement true or false?
  - (a)  True.
  - (b)  False.
  
- (2) [1 pt.] The fields of a record are never mutable. Is this statement true or false?
  - (a)  True.
  - (b)  False.
  
- (3) [2 pt.] A while loop is a(n)
  - (a) Expression of type boolean.
  - (b) Sequential control structure.
  - (c) Conditional control structure.
  - (d)  Iterative control structure.
  
- (4) [2 pt.] Write a simple piece of OCaml code that loops forever.

**Answer:**

```
while true do () done ;;
```

- (5) [4 pt.] Suppose `is_prime` is an OCaml function of type `int -> bool` that, given an input  $n$ , returns `true` as output if  $n$  is prime and returns `false` otherwise. Using a for loop and `is_prime`, write an OCaml function `sum_of_primes` of type `int -> int -> int` that, given  $m$  and  $n$  as input, returns the sum of the primes that are between  $m$  and  $n$  inclusive, i.e., the sum of primes  $p$  such that are  $m \leq p \leq n$ .

For example,

```
sum_of_primes 2 10 ;;
```

should return the value 17 since the set of primes between 2 and 10 inclusive is  $\{2, 3, 5, 7\}$  and  $2 + 3 + 5 + 7 = 17$ .

**Answer:**

```
let sum_of_primes m n =  
  let accum = ref 0 in  
  for i = m to n do  
    if is_prime i then accum := !accum + i  
  done ;  
  !accum ;;
```