CIS 120 Quiz 6

October 22, 2014

Name: 

PennKey: ____________________________ Section: ________________

PennKey means letters, not numbers.

Indicate the section you’re registered for, even if you’re attending a different section.
1. Write the type of each of the following expressions in the blank provided, or ill-typed if the expression does not type check.
   i. (fun f -> f 42)  
   ii. (fun x -> x + "foo")  

2. Consider the following Java code segment.

   ```java
class Ball {
    private int velocity;
    private int position;
    
    public Ball(int vel) {
      velocity = vel;
      position = 0;
    }
    
    public int getPosition() {
      return position;
    }
    
    public void timeStep(int time) {
      position += time * velocity;
    }
}
```

We can encode Ball objects as values belonging to an OCaml record type with two fields, get_position and time_step, corresponding to the methods of the same name above.

   ```ocaml
type ball = {
  get_position: unit -> int;
  time_step: int -> unit;
}
```

Your task in this problem is to implement a “constructor” for such objects—a function `create_ball` that builds values belonging to this record type. For example:

   ```ocaml
   let obj = create_ball 6 in
   obj.time_step 5;
   obj.get_position () (* should be 30 *)
```

Complete the definition of `create_ball` below to achieve this behavior.

   ```ocaml
   let create_ball (vel: int) : ball =
   ```