CS 421 --- Interpreter Activity 1

Manager	Keeps team on track	
Recorder	Records decisions / QC	
Reporter	Reports to class	
Reflector	Assesses team performance	

Hand in one copy per team. These are scanned, so please do not mangle the corners or staple it!

Code

Here is part of the code for the i3.hs interpreter.

```haskell
0  -- The Types
1
2  data Val = IntVal Integer
3      deriving (Show,Eq)
4
5  data Exp = IntExp Integer
6             | IntOpExp String Exp Exp
7      deriving (Show,Eq)
8
9  type Env = [(String,Exp)]
10
11 -- Evaluator
12
13 intOps = [ ("+",(+))
14          , ("-",(-))
15          , ("*",(*))
16          , ("/",div)]
17
18 liftIntOp f (IntVal i1) (IntVal i2) = IntVal (f i1 i2)
19 liftIntOp f _           _           = 0
20
21 eval :: Exp -> Env -> Val
22 eval (IntExp i) _ = IntVal i
23
24 eval (IntOpExp op e1 e2) env =
25   let v1 = eval e1 env
26       v2 = eval e2 env
27       Just f = lookup op intOps
28   in liftIntOp f e1 e2
```

Problem 1) There are three types declared for this interpreter. What do each of them do?

Problem 2) We did not write down the type for `intOps`. What do you think it should be?

Problem 3) The `Val` type only has integers. Why not make eval output integers directly then?

Problem 4) There are three bugs in the above code. What are they?

Problem 5) Notice that `lookup` returns a `Just`. Why do you think it does that?

Problem 6) Add variables to this. To do this you need to add a constructor to `Exp` and a clause to `eval`.

Problem 7) If there's time: add comparison operations to the language. You will need a separate variable `compOps` to do this, another constructor for `Exp`, and another clause for `eval`. You may need another lifting function as well. Why can't you just combine this with `intOps`?

Interpreter Activity 1--- Reflector's Report

Manager	Keeps team on track	
Recorder	Records decisions	
Reporter	Reports to Class	
Reflector	Assesses team performance	

1. What was a strength of your team's performance for this activity?

2. What could you do next time to increase your team's performance?

3. What insights did you have about the activity or your team's interaction today?

Interpreter Activity 1 --- Team's Assessment (SII)

Manager or Reflector: Consider the objectives of this activity and your team's experience with it, and then answer the following questions after consulting with your team.

1. What was a **strength** of this activity? List one aspect that helped it achieve its purpose.

2. What is one things we could do to **improve** this activity to make it more effective?

3. What **insights** did you have about the activity, either the content or at the meta level?