CS 421 --- Interpreter Activity 1

<table>
<thead>
<tr>
<th>Manager</th>
<th>Keeps team on track</th>
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<tbody>
<tr>
<td>Recorder</td>
<td>Records decisions / QC</td>
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<tr>
<td>Reporter</td>
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<tr>
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<td>Assesses team performance</td>
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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 liftIntOp f (IntVal i1) (IntVal i2) = IntVal (f i1 i2)
16 liftIntOp f _ _ = 0
17
18 eval :: Exp -> Env -> Val
19 eval (IntExp i) _ = IntVal i
20
21 eval (IntOpExp op e1 e2) env =  
22  let v1 = eval e1 env    
23  v2 = eval e2 env    
24  Just f = lookup op intOps  
25  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

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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 thing 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?