

# Lab 1 Writeup

Justin Cai

January 27, 2018

## 1 Scala Basics: Binding and Scope

- a. The use of `pi` on line 4 is bound at line 3. The scope in which that use of `pi` has a definition within that scope, so that binding is used. The use of `pi` on line 7 is bound at line 1. The `area` function does not create a new scope, and the scope in which `area` is defined has a definition of `pi` on line 1, so that one is used.
- b. The use of `x` on line 3 is bound at line 2. The function parameters of `f` are the innermost definition of `x`, so that binding is used. The use of `x` on line 6 is bound on line 5. `x` is not bound in that scope, so we use the binding of `x` provided by the `case` statement. The use of `x` on line 10 is bound on line 5. This is the same as the use on line 6. The use of `x` on line 13 is bound on line 1. This is the outermost scope, so there are no bindings to shadow and there is a binding provided on line 1, so that one is used.

## 2 Scala Basics: Typing

The body of `g` is well-typed, and returns a `((Int, Int), Int)`.

```
if (x==0) (b, 1) else (b, a+2): ((Int, Int), Int) because
(b, 1): ((Int, Int), Int)
(b, a+2): ((Int, Int), Int)
x: Int
3: Int
(x, 3): (Int, Int)
b: (Int, Int)
1: Int
a: Int
2: Int
a+2: Int
```