

CS_191 Functional Programming I

Programming Laboratory 3

Pairs and lists

In this Programming Laboratory session at least **two** out of the three Exercises must be solved. As always, you may work in pairs.

When your solutions are complete, please show them to a lab supervisor for assessment. You are expected to be able to explain your solutions and run the functions you defined with some test data.

Exercise 1 Suppose we represent a point in the two-dimensional plane by a pair of floats

```
type Point = (Float,Float)
```

Define the following operation:

- (a) The distance of two points.
- (b) Reflection of a point at the
 - x -axis,
 - y -axis,
 - diagonal,
 - origin.
- (c) scaling a point by a factor.

Exercise 2 Define a function `move` that takes a list and moves its first element to the end of the list. If the given list is empty, an error should be raised.

For example, `move [1,2,3,4]` should evaluate to `[2,3,4,1]`.

Exercise 3 Define a function `mkindex` that takes a list and computes the list of the elements of the list paired with their positions in the list.

For example, `mkindex "hello"` should evaluate to `[('h',0),('e',1),('l',2),('l',3),('o',4)]`.