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

```haskell
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)]`. 