Implementing Objects

**Problem 1)** Try implementing the point class in Python using Hash maps (associative array) to store the methods and the local variables. Include getx, gety, move, and report.

**Problem 2)** Now try writing `fastPoint`, where moves go twice as quickly. But this time take advantage of the fact that you have a hash table!
Implementing Mixins

**Problem 3)** Suppose we had a python function that emitted a `Counter` class using the hashmap technique. Can you think of a way to implement a mixin, so that your point class has access to `Counter` methods?

You could do this by modifying your `mkPoint` function, but you can also do this by extending your individual class!

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Covariance and Contravariance

**Problem 4)** Suppose you have a function \( f :: a \rightarrow b \), and you would like to use function composition to modify it so that you have a function \( f' :: a \rightarrow c \). What would this modifying function look like? Give a realistic example of when you might want this.

**Problem 5)** Suppose you have a function \( f :: a \rightarrow \text{Bool} \), and you would like to use function composition to modify it so that you have a function \( f' :: c \rightarrow \text{Bool} \). What would this modifying function look like? Give a realistic example of when you might want this.