

No time for math:  
How Clojure is  
making me a better  
Java programmer

```
{ :name "John Foo"  
  :languages [:en :je :ja]  
  :start-date #inst "2013-02-28" }
```

```
new HashMap<String, Object>() {{  
    put("name", "John Foo");  
    put("languages",  
        new ArrayList<LanguageCode>(){  
            add(LanguageCode.EN);  
            add(LanguageCode.JE);  
            add(LanguageCode.JA);  
        });  
    put("start-date",  
        DateFormat.  
            getInstance(  
                DateFormat.SHORT).  
                parse("02/28/13"));  
}};
```

```
public interface Map<K, V> {  
    V get(java.lang.Object o);  
}
```

```
public interface Map<K, V> {

    int size();

    boolean isEmpty();

    boolean containsKey(java.lang.Object o);

    boolean containsValue(java.lang.Object o);

    V get(java.lang.Object o);

    java.util.Set<K> keySet();

    V put(K k, V v);

    V remove(java.lang.Object o);

    void putAll(java.util.Map<? extends K,? extends V> map);

    void clear();

    java.util.Set<java.util.Map.Entry<K,V>> entrySet();

}
```

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}
```

```
(let [f {:foo 2 :bar 3}]  
  (+ (f :bar) 5))
```

# What is a map?



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$$(f: K \longrightarrow V, S), S \subseteq K$$

```
public interface Function<K, V> {  
    V apply(K input);  
}
```

```
public static <K, V> Function<K, V> mapToFunc(Map<K, V> map);
```

[illegible]

```
public static <K, V> Function<K, V> mapToFunc(Map<K, V> map);

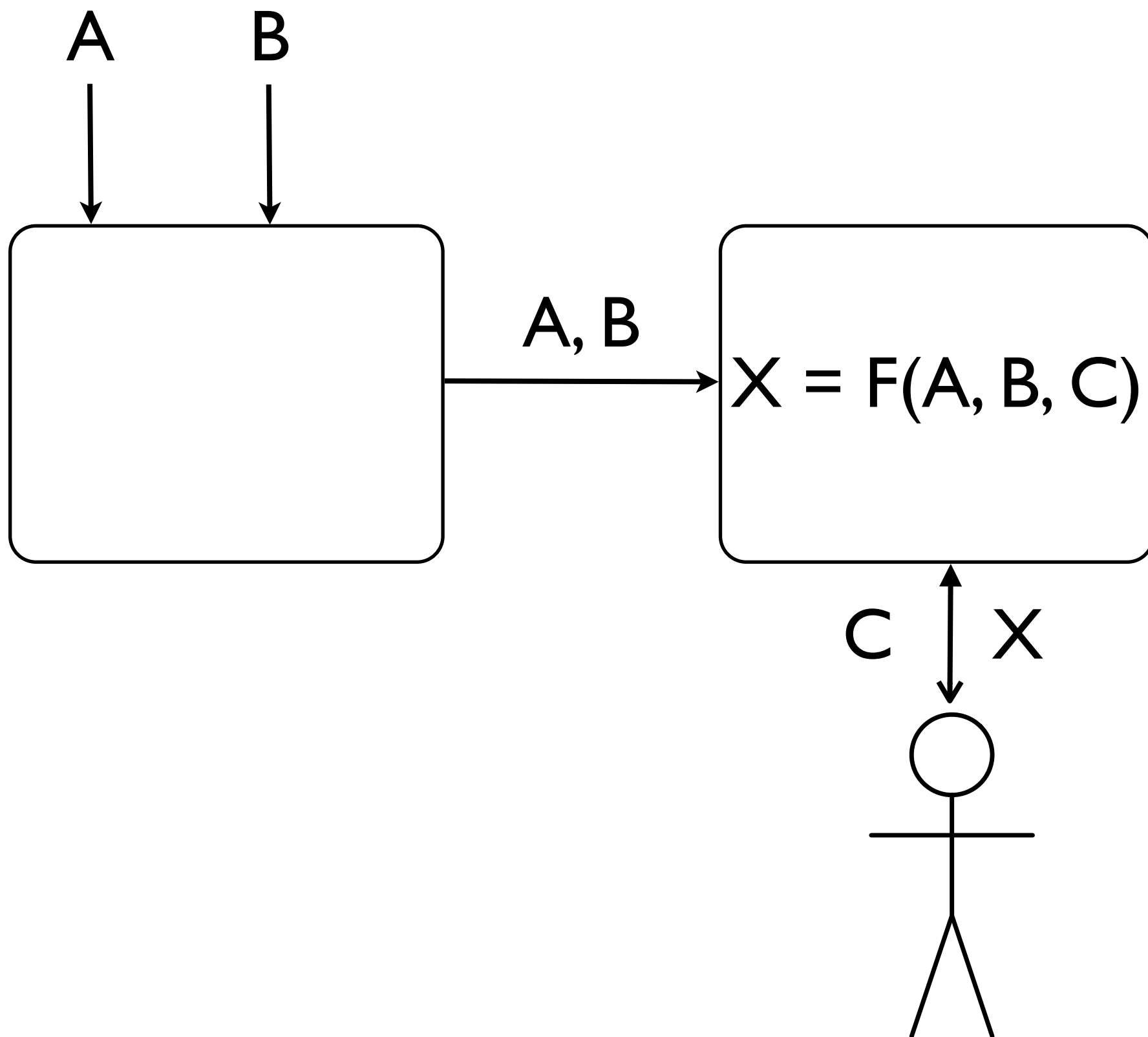
public static <K, V> Map<K, V> funcToMap(Function<K, V> func,
                                         Collection<K> keySet);

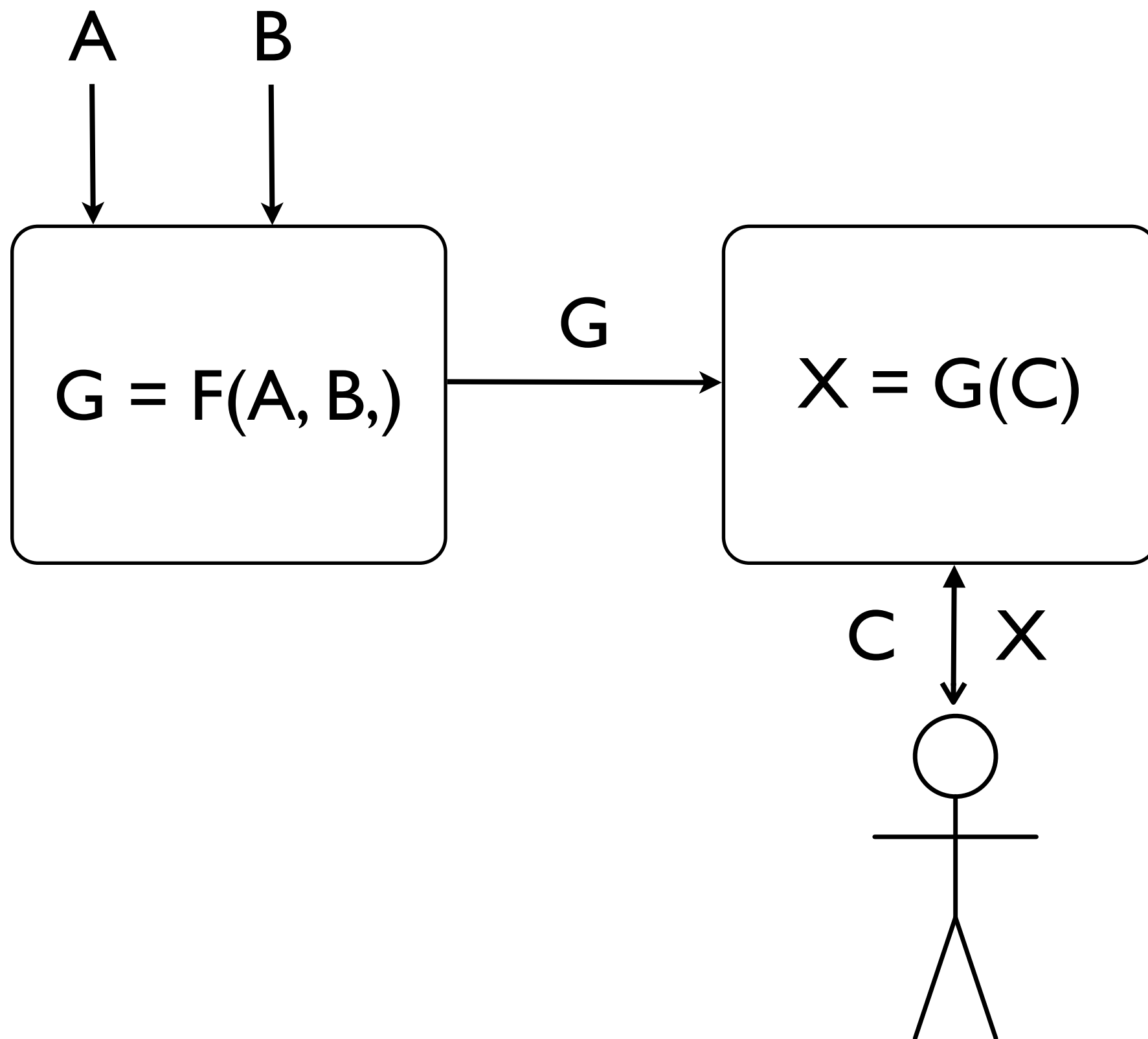
public static <K,V> Collection<V> transform(Collection<K> coll,
                                             Function<K, V> func);

public static <V> Collection<V> filter(Collection<V> unfiltered,
                                       Function<V, Boolean> pred);

public static <K,V> Map<V, Collection<V>> groupBy(
                                             Collection<V> coll,
                                             Function<V, K> keyFunc);

public static <K,V> Function<K, V> memoize(Function<K, V> func);
```





# Representing Functions

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- As code:

```
(fn [x] (+ 2 (* x 3)))
```



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- As a set of ordered pairs:

```
#{[0 2], [1 5], [2 8], [3 11]}
```

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- As code:

```
(fn [x] (+ 2 (* x 3)))
```

- As a set of ordered pairs:

```
(into {} #{[0 2], [1 5], [2 8], [3 11]})
```

```
(defn linear [lneighbor
              rneighbor
              exact]

  (f [x]
    (if-let [[_ y] (exact x)]
      y
      (let [[x1 y1] (lneighbor x)
            [x2 y2] (rneighbor x)
            m (/ (- y2 y1) (- x2 x1))]
        (+ (* m (- x x1)) y1))))
```