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### **XenoHematology write up**

Doubling Ratio: 1.0

Pseudo Code:

find is directly from Sedgewick including path compression, and as per Sedgewick this is near constant time per find

union is also per Sedgewick using weighted path compression which is also near constant time because it uses find to create union

the areCompatible and areIncompatible methods both use find to determine whether the two inputs are compatible or incompatible so also should be close to constant time

and again, the set compatible and set in compatible methods just use the find and union methods provided by Sedgewick to set compatibility and incompatibility which is also constant.

The program uses arrays only so all look ups are constant and nowhere in the compatibility methods does it require looping through the array, so all actions are constant.

The constructor requires instantiating the array with values which is  $n$  time but since this only occurs once the program starts is not considered for remainder of usage