Retrospect Implementation Notes

* Object initialization
  + Native objects
    - Generate no-argument constructor
    - Technically works – VM doesn’t verify final fields are assigned
    - Not ideal because VM might be free to cache values, ignore assignments, etc.
    - Could also use FieldMapMirrors instead – may be faster than reflection-based NativeObjectMirrors
    - Should refactor mirror interface to use constant pool offsets instead of field names
      * Can dynamically generate native mirrors that use a switch to select the right field
  + Mirage objects
    - Add extra mirror field to constructors, pass up super chain
      * Doesn’t handle reflection (i.e. Class#newInstance)
      * In fact, messes up reflection entirely since the parameter types are wrong
    - How to distinguish calls to new (where mirror should be instantiated) from calls to super (where mirror should be passed along?)
      * Both are just INVOKESPECIAL
    - Instead, two ObjectMirage constructors
      * Nullary for new statements – creates native mirror inline
      * One that takes a mirror for calls to ObjectMirage.make
* Special cases
  + All classes must extend Object, which declares toString()
    - Therefore all toString() methods must return actual java.lang.String instances
  + Object identity
    - How to define ==?
      * Could define ObjectMirror.sameObject(Object other)
      * Could allow mirages to be different, even if calling ObjectMirage.make() on the same mirror object twice
    - How to define hashCode()?
      * Supposed to be consistent across a single VM execution
    - How to define equals()?
* Native methods
  + Enumerate replacements
    - Use AspectJ binaries even at this point (around execution)?