

Language-Based Formal Methods

Programming Languages
+
Mathematical Logic
=
Software Verification

Example: Quicksort

Problems:

- What if lo or hi is negative?
- What if $hi < lo$?
- What if the size of the list is 0?

```
algorithm quicksort(A:List Int, lo:Int, hi:Int) {  
  p := partition(A, lo, hi)  
  quicksort(A, lo, p)  
  quicksort(A, p + 1, hi)  
}
```

```
algorithm partition(A:List Int, lo:Int, hi:Int) {  
  mid = (lo + hi) / 2  
  pivot := A[mid]  
  ...  
}
```