

MODULE *KnightsKnaves*

https://www.reddit.com/r/scala/comments/6kpqqw/knights_and_knaves/

CONSTANT *Native*

CONSTANT *Knight, Knave*

ASSUME *KnightOrKnave* \triangleq *Knight* \cup *Knave* = *Native* \wedge *Knight* \cap *Knave* = $\{\}$

Lying(*p*) \triangleq *p* \in *Knave*

Truthful(*p*) \triangleq *p* \in *Knight*

p $:\>$ *statement* \triangleq *Truthful*(*p*) \equiv *statement* *p* says

Problem 1

CONSTANTS *A, B, C*

ASSUME *ABC_Natives* \triangleq $\{A, B, C\} \subseteq$ *Native*

ASSUME *B_Says* \triangleq *B* $:\>$ (*A* $:\>$ (*A* \in *Knave*))

ASSUME *C_Says* \triangleq *C* $:\>$ *Lying*(*B*)

THEOREM *C* \in *Knight*

PROOF BY *KnightOrKnave, ABC_Natives, B_Says, C_Says* DEF $:\>$, *Lying, Truthful*