;; Modelling the Wumpus World in PDDL: 3rd time’s a charm...
;; by: Patrik Haslum
;; Source web page:
;;
(define (domain wumpus-c)
  (:requirements :strips)
  (:predicates
    (at ?what ?square)
    (adj ?square-1 ?square-2)
    (pit ?square)
    (wumpus-in ?square)
    ;; <-> (exists ?x (and (is-wumpus ?x) (at ?x ?square) (not (dead ?x)))
    (have ?who ?what)
    (is-agent ?who)
    (is-wumpus ?who)
    (is-gold ?what)
    (is-arrow ?what)
    (dead ?who))

  (:action move-agent
    :parameters (?who ?from ?to)
    :precondition (and (is-agent ?who)
      (at ?who ?from)
      (adj ?from ?to)
      (not (pit ?to))
      (not (wumpus-in ?to)))
    :effect (and (not (at ?who ?from))
      (at ?who ?to)))
)

  (:action take
    :parameters (?who ?what ?where)
    :precondition (and (is-agent ?who)
      (at ?who ?where)
      (at ?what ?where))
    :effect (and (have ?who ?what)
      (not (at ?what ?where)))
  )

  (:action shoot
    :precondition (and (is-agent ?who)
      (have ?who ?with-what)
      (is-arrow ?with-what)
      (at ?who ?where)
      (is-wumpus ?victim)
      (at ?victim ?where-victim)
      (adj ?where ?where-victim))
    :effect (and (dead ?victim)
      (not (wumpus-in ?where-victim))
      (not (have ?who ?with-what)))
  )
)
(:action move-wumpus
  :parameters (?who ?from ?to)
  :precondition (and (is-wumpus ?who)
    (at ?who ?from)
    (adj ?from ?to)
    (not (pit ?to))
    (not (wumpus-in ?to)))
  :effect (and (not (at ?who ?from))
    (at ?who ?to)
    (not (wumpus-in ?from))
    (wumpus-in ?to))
)

(define (problem wumpus-c-1)
  (:domain wumpus-c)
  (:objects sq-1-1 sq-1-2 sq-1-3
           sq-2-1 sq-2-2 sq-2-3
           the-gold the-arrow
           agent wumpus)
  (:init (adj sq-1-1 sq-1-2) (adj sq-1-2 sq-1-1)
    (adj sq-1-2 sq-1-3) (adj sq-1-3 sq-1-2)
    (adj sq-2-1 sq-2-2) (adj sq-2-2 sq-2-1)
    (adj sq-2-2 sq-2-3) (adj sq-2-3 sq-2-2)
    (adj sq-1-1 sq-2-1) (adj sq-2-1 sq-1-1)
    (adj sq-1-2 sq-2-2) (adj sq-2-2 sq-1-2)
    (adj sq-1-3 sq-2-3) (adj sq-2-3 sq-1-3)
    (pit sq-1-2)
    (is-gold the-gold)
    (at the-gold sq-1-3)
    (is-agent agent)
    (at agent sq-1-1)
    (is-arrow the-arrow)
    (have agent the-arrow)
    (is-wumpus wumpus)
    (at wumpus sq-2-3)
    (wumpus-in sq-2-3))
  (:goal (and (have agent the-gold) (at agent sq-1-1)))
)

Resulting plan:

(MOVE-AGENT AGENT SQ-1-1 SQ-2-1)
(MOVE-AGENT AGENT SQ-2-1 SQ-2-2)
(SHOOT AGENT SQ-2-2 THE-ARROW WUMPUS SQ-2-3)
(MOVE-AGENT AGENT SQ-2-2 SQ-2-3)
(MOVE-AGENT AGENT SQ-2-3 SQ-1-3)
(TAKE AGENT THE-GOLD SQ-1-3)
(MOVE-AGENT AGENT SQ-1-3 SQ-2-3)
(MOVE-AGENT AGENT SQ-2-3 SQ-2-2)
(MOVE-AGENT AGENT SQ-2-2 SQ-2-1)
(MOVE-AGENT AGENT SQ-2-1 SQ-1-1)