PDDL2.X

☐ Domain definition. Functions (numbers)

```
(define (domain zeno-travel)
(:requirements :durative-actions :typing :fluents)
(:types aircraft person city - object)
(:predicates (at ?x - (either person aircraft) ?c - city)
             (in ?p - person ?a - aircraft))
(:functions (fuel ?a - aircraft)
            (distance ?c1 - city ?c2 - city)
            (slow-speed ?a - aircraft)
            (fast-speed ?a - aircraft)
            (slow-burn ?a - aircraft)
            (fast-burn ?a - aircraft)
            (capacity ?a - aircraft)
            (refuel-rate ?a - aircraft)
            (total-fuel-used)
            (boarding-time)
            (debarking-time)
            )
```

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☐ Domain definition. Operators with time

```
(:durative-action fly
 :parameters (?a - aircraft ?c1 ?c2 - city)
 :duration (= ?duration (/ (distance ?c1 ?c2) (slow-speed ?a)))
 :condition (and (at start (at ?a ?c1))
                 (at start (>= (fuel ?a)
                               (* (distance ?c1 ?c2) (slow-burn ?a))))))
 :effect (and (at start (not (at ?a ?c1)))
              (at end (at ?a ?c2))
              (at end (increase total-fuel-used
                              (* (distance ?c1 ?c2) (slow-burn ?a))))
              (at end (decrease (fuel ?a)
                              (* (distance ?c1 ?c2) (slow-burn ?a))))))


(:durative-action refuel
 :parameters (?a - aircraft ?c - city)
 :duration (= ?duration (/ (- (capacity ?a) (fuel ?a)) (refuel-rate ?a)))
 :condition (and (at start (> (capacity ?a) (fuel ?a)))
                 (over all (at ?a ?c)))
 :effect (at end (assign (fuel ?a) (capacity ?a))))
```

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☐ Problem definition

```
(define (problem zeno-1-temp-problems-0-4) (:domain zenotravel)
  (:objects
     pepe0 pepe1 pepe2 pepe3 pepe4 - PERSON
     city0 city1 city2 city3 city4 - CITY
     pl0 pl1 pl2 - AIRCRAFT  )
  (:init     ( IN PEPE0 PL1)
     ( IN PEPE1 PL0)
     ( AT PEPE2 CITY2)
     ( AT PEPE3 CITY1)
     ( IN PEPE4 PL2)
     (  = (distance CITY1 CITY0) 1316.6534)
     (  = (distance CITY0 CITY1) 1316.6534)
     (  = (distance CITY2 CITY0) 1408.3523)
     ( AT PL0 CITY3)
     (  = (fast-speed PL0) 10.855)
     (  = (slow-speed PL0) 8.376)
     (  = (capacity PL0) 913.24)
     (  = (fuel PL0) 334.21)
     (  = (fast-burn PL0) 0.5)
     (  = (slow-burn PL0) 0.17)
     (  = (refuel-rate PL0) 4.313)
     ( AT PL1 CITY4)
     (  = (fast-speed PL1) 6.136)
     (  = (slow-speed PL1) 4.795)
     (  = (capacity PL1) 1477.02)
     (  = (fuel PL1) 866.79)
     (  = (fast-burn PL1) 0.809)
     (  = (slow-burn PL1) 0.1)
     (  = (refuel-rate PL1) 6.33)
     ( AT PL2 CITY1)
     (  = (fast-speed PL2) 18.846)
     (  = (slow-speed PL2) 10.075)
     (  = (capacity PL2) 992.08)
     (  = (fuel PL2) 834.49)
     (  = (fast-burn PL2) 0.543)
     (  = (slow-burn PL2) 0.1)
     (  = (refuel-rate PL2) 13.371)
  )
  (:goal
     (at pepe2 city0))
)
```