Marios Pafitis (mpafit02)

PDDL Elevator (LAMA planner)

1. Predicates

```
(:predicates
        (move_one ?x ?y)
        (move_ten ?x ?y)
        (slow ?x ?y)
        (fast ?x ?y)
        (worker ?x ?y)
        (in ?x ?y)
    )
```

1.1 Move one floor predicate (move_one ?x ?y)

This predicate is being used to check if it is possible to move from floor x to floor y, where y can be only x+1 or x -1. The elevator can use its floor x and see if it can move to the floor y.

1.2 Move ten floors predicate (move_ten ?x ?y)

This predicate is being used to check if it is possible to move from floor x to floor y, where y can be only x+10 or x -10. The elevator can use its floor x and see if it can move to the floor y.

1.3 Slow elevator predicate (slow ?x ?y)

This predicate is being used to check if the **slow** elevator x is at floor y.

1.4 Fast elevator predicate (fast ?x ?y)

This predicate is being used to check if the **fast** elevator x is at floor y.

1.5 Position of worker predicate (worker ?x ?y)

This predicate is being used to check if the worker x is at floor y.

1.6 In the elevator predicate (in ?x ?y)

This predicate is being used to check if the worker x is in the elevator y.

2. Actions

2.1 Move slow elevator one floor action (:action move_one_floor …)

This action takes as parameters an elevator ‘l’, a floor ‘from’ and another floor ’to’. If a slow elevator is at floor ‘from’ (slow ?l ? from) and it can move one floor, either up or down, to the floor ‘to’ (move_one ?from ?to) then, it moves the slow elevator to the floor ‘to’ (slow ?l ?to) and because the elevator ‘l’ is no longer at floor ‘from’, we remove it (not (slow ?l ?from)).

```
(:action move_one_floor
        :parameters (?l ?from ?to)
        :precondition (and (slow ?l ?from)
                           (move_one ?from ?to))
        :effect  (and (slow ?l ?to)
                      (not (slow ?l ?from)))
    )
```

2.2 Move fast elevator ten floors action (:action move_ten_floor …)

This action takes as parameters an elevator ‘l’, a floor ‘from’ and another floor ’to’. If a fast elevator is at floor ‘from’ (fast ?l ? from) and it can move ten floors, either up or down, to the floor ‘to’ (move_ten ?from ?to) then, it moves the slow elevator to the floor ‘to’ (fast ?l ?to) and because the elevator ‘l’ is no longer at floor ‘from’, we remove it (not (fast ?l ?from)).

```
 (:action move_ten_floor
        :parameters (?l ?from ?to)
        :precondition (and (fast ?l ?from)
                           (move_ten ?from ?to))
        :effect  (and (fast ?l ?to)
                      (not (fast ?l ?from)))
    )
```

2.3 Worker get in a slow elevator action (:action get_in_slow …)

This action takes as parameters an elevator ‘l’, a worker ‘w’ and a floor ‘floor’. If a slow elevator ‘l’ is at floor ‘floor’ (slow ?l ?floor) and a worker ‘w’ at floor ‘floor’ (worker ?w ?floor), then the worker gets in the slow elevator (in ?w ?l) and we remove him from the floor (not (worker ?w ?floor)).

```
(:action get_in_slow
        :parameters (?l ?w ?floor)
        :precondition (and (slow ?l ?floor)
                           (worker ?w ?floor))
        :effect  (and (in ?w ?l)
                      (not (worker ?w ?floor)))
    )
```

2.4 Worker get in a fast elevator action (:action get_in_fast …)

This action takes as parameters an elevator ‘l’, a worker ‘w’ and a floor ‘floor’. If a fast elevator ‘l’ is at floor ‘floor’ (fast ?l ?floor) and a worker ‘w’ at floor ‘floor’ (worker ?w ?floor), then the worker gets in the fast elevator (in ?w ?l) and we remove him from the floor (not (worker ?w ?floor)).

```
(:action get_in_fast
        :parameters (?l ?w ?floor)
        :precondition (and (fast ?l ?floor)
                           (worker ?w ?floor))
        :effect  (and (in ?w ?l)
                      (not (worker ?w ?floor)))
    )
```

2.5 Worker get out from a slow elevator action (:action get_out_slow …)

This action takes as parameters an elevator ‘l’, a worker ‘w’ and a floor ‘floor’. If a slow elevator ‘l’ is at floor ‘floor’ (slow ?l ?floor) and a worker ‘w’ is in the elevator (in ?w ?l), then the worker gets out from the elevator in the floor that we are currently (worker ?w ?floor) and we remove him from inside the slow elevator (not (in ?w ?l)).

```
(:action get_out_slow
        :parameters (?l ?w ?floor)
        :precondition (and (slow ?l ?floor)
                           (in ?w ?l))
        :effect  (and (worker ?w ?floor)
                      (not (in ?w ?l)))
    )
```

2.6 Worker get out from a fast elevator action (:action get_out_fast …)

This action takes as parameters an elevator ‘l’, a worker ‘w’ and a floor ‘floor’. If a fast elevator ‘l’ is at floor ‘floor’ (fast ?l ?floor) and a worker ‘w’ is in the elevator (in ?w ?l), then the worker gets out from the elevator in the floor that we are currently (worker ?w ?floor) and we remove him from inside the fast elevator (not (in ?w ?l)).

```
(:action get_out_fast
        :parameters (?l ?w ?floor)
        :precondition (and (fast ?l ?floor)
                           (in ?w ?l))
        :effect  (and (worker ?w ?floor)
                      (not (in ?w ?l)))
    )
```