

# PARKING SEQUENTIAL SATISFICING





# GRUPO 3

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# PROBLEMATICA

O objetivo é estacionar carros em uma rua com  $(N)$  pontos de meio-fio. O objetivo é mover de uma configuração inicial de carros estacionados para uma que esteja ordenada de cima para baixo e da direita para a esquerda.



## CONDIÇÃO

É permitido estacionar em duplo, mas não é permitido estacionar em fila tripla.



A yellow ribbon graphic with a central rectangular section and two pointed ends, set against a dark blue background. The word "EXPLICAÇÕES" is written in white, bold, uppercase letters across the central section.

**EXPLICAÇÕES**

# DOMAIN

- **(at-curb)** Indica que um carro está em uma calçada
- **(at-curb-num)** Indica que um carro está em uma calçada específica
- **(behind-car)** Indica que um carro está atrás de outro carro.
- **(car-clear)** Indica que um carro não está bloqueado por outro carro
- **(curb-clear)** Indica que uma calçada está livre, ou seja, não está bloqueada por um carro.

```
(define (domain parking)
  (:requirements :strips :typing :action-costs)
  (:types car curb)
  (:predicates
    (at-curb ?car - car)
    (at-curb-num ?car - car ?curb - curb)
    (behind-car ?car ?front-car - car)
    (car-clear ?car - car)
    (curb-clear ?curb - curb)
  )
)
```



# MOVE-CURB-TO-CURB

```
(:action move-curb-to-curb
  :parameters (?car - car ?curbsrc ?curbdest - curb)
  :precondition (and
    (car-clear ?car)
    (curb-clear ?curbdest)
    (at-curb-num ?car ?curbsrc)
  )
  :effect (and
    (not (curb-clear ?curbdest))
    (curb-clear ?curbsrc)
    (at-curb-num ?car ?curbdest)
    (not (at-curb-num ?car ?curbsrc))
    (increase (total-cost) 1)
  )
)
```

Curb\_01



Curb\_02



# MOVE-CURB-TO-CAR

```
(:action move-curb-to-car
  :parameters (?car - car ?curbsrc - curb ?cardest - car)
  :precondition (and
    (car-clear ?car)
    (car-clear ?cardest)
    (at-curb-num ?car ?curbsrc)
    (at-curb ?cardest)
  )
  :effect (and
    (not (car-clear ?cardest))
    (curb-clear ?curbsrc)
    (behind-car ?car ?cardest)
    (not (at-curb-num ?car ?curbsrc))
    (not (at-curb ?car))
    (increase (total-cost) 1)
  )
)
```

Curb\_01

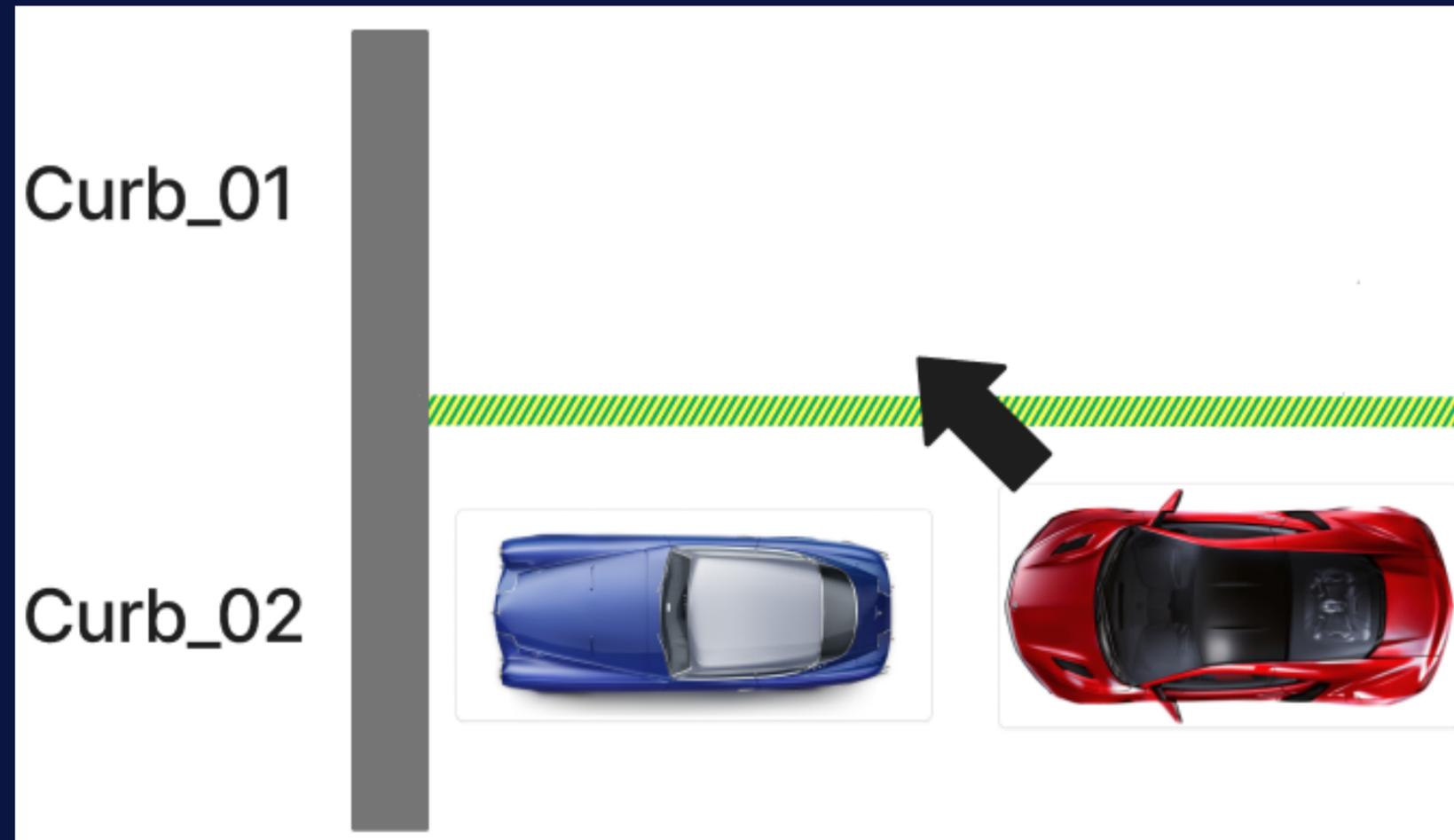


Curb\_02



# MOVE-CAR-TO-CURB

```
(:action move-car-to-curb
  :parameters (?car - car ?carsrc - car ?curbdest - curb)
  :precondition (and
    (car-clear ?car)
    (curb-clear ?curbdest)
    (behind-car ?car ?carsrc)
  )
  :effect (and
    (not (curb-clear ?curbdest))
    (car-clear ?carsrc)
    (at-curb-num ?car ?curbdest)
    (not (behind-car ?car ?carsrc))
    (at-curb ?car)
    (increase (total-cost) 1)
  )
)
```



# MOVE-CAR-TO-CAR

```
(:action move-car-to-car
  :parameters (?car - car ?carsrc - car ?cardest - car)
  :precondition (and
    (car-clear ?car)
    (car-clear ?cardest)
    (behind-car ?car ?carsrc)
    (at-curb ?cardest)
  )
  :effect (and
    (not (car-clear ?cardest))
    (car-clear ?carsrc)
    (behind-car ?car ?cardest)
    (not (behind-car ?car ?carsrc))
    (increase (total-cost) 1)
  )
)
```

Curb\_01



Curb\_02



A yellow ribbon graphic with a central rectangular section and two pointed ends, set against a dark blue background. The word 'RESOLUÇÃO' is written in white capital letters across the central section.

**RESOLUÇÃO**

# INSTANCE 1

## Posições iniciais

```
; ===== INIT =====  
; curb_00: car_02 car_05  
; curb_01: car_23 car_09  
; curb_02: car_20 car_25  
; curb_03: car_06 car_21  
; curb_04: car_26 car_03  
; curb_05: car_27 car_14  
; curb_06: car_17 car_24  
; curb_07: car_00 car_18  
; curb_08: car_01 car_08  
; curb_09: car_10 car_16  
; curb_10: car_22 car_04  
; curb_11: car_19 car_13  
; curb_12: car_07 car_12  
; curb_13: car_11 car_15  
; curb_14:  
; ===== /INIT =====
```

## Posições desejadas

```
; ===== GOAL =====  
; curb_00: car_00 car_15  
; curb_01: car_01 car_16  
; curb_02: car_02 car_17  
; curb_03: car_03 car_18  
; curb_04: car_04 car_19  
; curb_05: car_05 car_20  
; curb_06: car_06 car_21  
; curb_07: car_07 car_22  
; curb_08: car_08 car_23  
; curb_09: car_09 car_24  
; curb_10: car_10 car_25  
; curb_11: car_11 car_26  
; curb_12: car_12 car_27  
; curb_13: car_13  
; curb_14: car_14  
; ===== /GOAL =====
```



# Resultado

COM AS CONFIGURAÇÕES FORNECIDAS, A SOLUÇÃO FOI ENCONTRADA COM A EXECUÇÃO DE **87 PASSOS** PELO LAMA-FIRST.

(move-car-to-curb car\_07 car\_13 curb\_07)  
(move-car-to-car car\_22 car\_14 car\_07)  
(move-car-to-car car\_02 car\_17 car\_14)  
(move-car-to-car car\_16 car\_01 car\_17)  
(move-curb-to-car car\_01 curb\_08 car\_13)  
(move-car-to-curb car\_11 car\_26 curb\_08)  
(move-curb-to-car car\_26 curb\_01 car\_11)  
(move-car-to-curb car\_01 car\_13 curb\_01)  
(move-car-to-car car\_16 car\_17 car\_01)  
(move-car-to-car car\_23 car\_08 car\_17)  
(move-curb-to-car car\_08 curb\_02 car\_13)  
(move-car-to-curb car\_02 car\_14 curb\_02)  
(move-car-to-car car\_23 car\_17 car\_14)  
(move-curb-to-car car\_17 curb\_10 car\_02)  
(move-car-to-curb car\_26 car\_11 curb\_10)  
(move-curb-to-car car\_11 curb\_08 car\_26)  
(move-car-to-curb car\_08 car\_13 curb\_08)  
(move-car-to-car car\_23 car\_14 car\_08)  
(move-car-to-car car\_11 car\_26 car\_14)  
(move-car-to-car car\_24 car\_09 car\_26)  
(move-curb-to-car car\_09 curb\_11 car\_13)  
(move-car-to-curb car\_11 car\_14 curb\_11)  
(move-car-to-car car\_25 car\_10 car\_14)  
(move-curb-to-car car\_10 curb\_09 car\_11)  
(move-car-to-curb car\_09 car\_13 curb\_09)  
(move-car-to-car car\_24 car\_26 car\_09)  
(move-car-to-car car\_10 car\_11 car\_26)  
(move-car-to-car car\_10 car\_26 car\_13)  
(move-curb-to-car car\_26 curb\_10 car\_11)  
(move-car-to-curb car\_10 car\_13 curb\_10)  
(move-car-to-car car\_25 car\_14 car\_10)

**OBRIIGADO!**

