

N-PUZZLE

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Características Gerais

— — —

- web-server
- A^*
- h'_1 e h'_2

Implementação

HTML

```
;;requisições
;;chama página index
(define (start request)
  (show-index request))
;;chama a página solve
(define (heuristica request)
  (show-h request))
;;chama página treinar
(define (treinar request)
  (show-treinar request))
;;chama página help
(define (help request)
  (show-help request))
;;pega nickname do submit
(define (parse-nickname bindings)
  (extract-binding/single 'nickname bindings))
```

HTML

```
;;define página de jogo (top10)
(define (show-play nickname request)
  (define (response-generator embed/url)
    (response/xexpr
      `(html (head (title "8-PUZZLE")
        (link ((rel "stylesheet")
              (href "https://fonts.googleapis.com/css?family=Lora:400,700,400italic,700italic")
              (type "text/css"))))
        (link ((rel "stylesheet")
              (href "https://fonts.googleapis.com/css?family=Cabin:700")
              (type "text/css"))))
        (link ((rel "stylesheet")
              (href "/css/tabuleiro_screen.css")
              (type "text/css"))))
        (link ((rel "stylesheet")
              (href "/css/tabuleiro.css")
              (type "text/css"))))
        (link ((rel "stylesheet")
              (href "/css/grayscale.min.css")
              (type "text/css"))))
        (link ((rel "stylesheet")
              (href "/css/nav.css")
              (type "text/css")))))
      (body
```

HTML

```
(body
;nav
(nav ([class "navbar navbar-expand-lg navbar-light fixed-top"] [id "mainNav"]))
  (div ((class "container"))
    (div ([class "collapse navbar-collapse"][id "navbarResponsive"]))
      (ul ((class "navbar-nav ml-auto"))
        (li ((class "nav-item"))
          (a ([href ,(embed/url start)][class "nav-link js-scroll-trigger"])
            ,(INICIO))))))
```

HTML

```
;conteudo

```

HTML

```
;form com nickname e score

```


HTML

```
(define (parse-score bindings)
  (extract-binding/single 'score bindings))

(define (init-play-handler request)
  (define campos (string-append "'" (parse-nickname (request-bindings request)) "'" "," "'" (parse-score (request-bindings request))
    (define query(string-append (string-append "INSERT INTO users(nickname, score) VALUES ("campos)"))
    (query-exec pgc query)
    (define u(user 1 (parse-nickname (request-bindings request)) (parse-score (request-bindings request))))
    (load-users-2)
    (start request))

  (send/suspend/dispatch response-generator))
```

A*

```
(define (a-star INIT)
  ;; OPEN e CLOSED
  (define OPEN (make-heap (lambda (v1 v2) (node-<= v1 v2))))
  (define CLOSED (make-hash))

  (heap-add! OPEN (make-node INIT empty 'FIM))
  (set! RAM 0)
  (define (loop)
    (cond
      [(empty? OPEN) (error "OPEN empty")]
      [else
       (define x (heap-min OPEN))
       (heap-remove-min! OPEN)
       (cond
         ((goal? (node-board x)) (get-solution x))
         [else
          (hash-set! CLOSED (node-board x) x)
          (for-each
           (lambda (y)
            (hash-ref CLOSED (node-board y) (lambda () (heap-add! OPEN y) (set! RAM (add1 RAM)))))
           (EXTRACT x)) (loop)
          )]]))
    (loop))
```

A*

```
#####  
;#      a-star      #  
#####  
(define K 3) ;;matriz K*K fixada em 3  
(define SIZE (- (* K K) 1))  
(define T (- K 1))  
  
(define RAM 0) ;;memória usada  
  
(define (index-list count)  
  (define (loop i)  
    (cond  
      [(= i count) (list i)]  
      [else (append (list i) (loop (add1 i)))]))  
  (loop 0))
```

Análise

Casos de Teste

```
(define 8-inst-1 (list 6 4 2 1 5 3 7 0 8))  
(define 8-inst-2 (list 0 2 5 1 8 3 7 4 6))  
(define 8-inst-3 (list 8 0 7 6 5 4 3 2 1))  
(define 8-inst-4 (list 8 3 2 5 1 0 7 4 6))  
(define 8-inst-5 (list 6 4 7 8 5 0 3 2 1))
```

```
(define 15-inst-1 (list 1 0 3 4 11 2 13 14 10 12 15 5 8 9 7 6))  
(define 15-inst-2 (list 2 13 3 14 10 1 12 4 5 11 15 8 0 9 7 6))  
(define 15-inst-3 (list 1 11 5 13 0 10 7 3 14 6 4 2 9 12 8 15))  
(define 15-inst-4 (list 12 1 2 3 11 13 14 4 10 15 6 5 0 9 8 7))  
(define 15-inst-5 (list 1 2 3 4 11 12 13 14 10 9 15 5 0 8 7 6))
```

```
(define 24-inst-1 (list 2 3 0 4 5 1 7 8 9 10 6 11 12 13 15 16 17 18 14 20 21 22 23 19 24))  
(define 24-inst-2 (list 1 2 3 5 10 6 7 8 4 0 11 12 13 9 15 16 17 18 14 20 21 22 23 19 24))  
(define 24-inst-3 (list 2 3 5 4 10 12 1 6 7 15 13 8 9 0 20 11 17 18 14 24 16 21 22 23 19))  
(define 24-inst-4 (list 11 6 1 2 3 21 7 8 4 5 17 16 12 10 15 0 13 14 18 9 22 23 19 20 24))  
(define 24-inst-5 (list 2 3 4 5 10 6 1 7 8 9 16 11 12 13 15 17 18 14 0 20 21 22 23 19 24))
```

Casos de Teste

```
(define 35-inst-1 (list 1 2 4 5 6 12 7 8 3 17 10 18 14 9 16 28 11 24 13 19 20 22 29 23 25 26 0 21 30 15 31 32 27 33 34 35))  
(define 35-inst-2 (list 1 2 4 5 6 12 7 0 3 17 10 18 14 8 16 28 11 24 13 9 20 22 29 23 25 19 26 21 30 15 31 32 27 33 34 35))  
(define 35-inst-3 (list 7 1 4 5 6 12 0 2 3 17 10 18 14 8 16 28 11 24 13 9 20 22 29 23 25 19 26 21 30 15 31 32 27 33 34 35))
```

Resultados (8-puzzle)

Caso	Tempo	
	$h'1$	$h'2$
1	8.17	7.82
2	110.88	20
3	3769.73	19.8
4	1578.57	263.84
5	11084.59	621.97

Caso	Memória	
	$h'1$	$h'2$
1	88	34
2	2702	751
3	98191	432
4	48665	5942
5	235150	12284

Resultados (15-puzzle)

Caso	Tempo	
	$h'1$	$h'2$
1	595.91	160.97
2	-	1076.33
3	-	8001.73
4	-	7866.44
5	-	38089.02

Caso	Memória	
	$h'1$	$h'2$
1	17971	4339
2	-	24831
3	-	178484
4	-	136372
5	-	726085

Resultados (24-puzzle)

Caso	Tempo	
	$h'1$	$h'2$
1	2.41	3.07
2	2.39	4.40
3	-	42.023
4	-	4097.83
5	-	12.05

Caso	Memória	
	$h'1$	$h'2$
1	24	24
2	17	17
3	-	657
4	-	66212
5	-	142

Resultados (35-puzzle)

Caso	Tempo	
	$h'1$	$h'2$
1	-	18918.41
2	-	40777.10
3	-	47531.65

Caso	Memória	
	$h'1$	$h'2$
1	-	191839
2	-	463531
3	-	444916