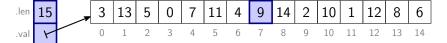
```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2];
  uint a = -1;
  uint b = t.len;
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
```



```
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     swap(t, a, b);
```



```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1;
  uint b = t.len;
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
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```



```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* -1 */
  uint b = t.len;
  while (1) {
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    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
```



```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* -1 */
  uint b = t.len; /* 15 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
```



```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* -1 */
  uint b = t.len; /* 15 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
```



```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 0 */
  uint b = t.len; /* 15 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
           a
.len 15
              13 5
                          11
                                                12
           3
                     0
                                    14
                                          10
                                              1
```

8

10 11

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 0 */
  uint b = t.len; /* 15 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
            a
.len | 15
           3 | 13 | 5
                           11
                                     14 | 2 | 10
                                                 12
                     0
```

8

10 11

3

```
int pivot = t.val[(t.len-1)/2]; /* 9 */
 uint a = -1; /* 1 */
 uint b = t.len; /* 15 */
 while (1) {
   do { a++; } while (t.val[a] < pivot);</pre>
   do { b--; } while (t.val[b] > pivot);
   if (a >= b) { return b; }
    swap(t, a, b);
              а
.len | 15
             13 5
                          11
                                                12
                    0
                                   14
                                          10
                                             1
```

8

10 11

3

uint partition (Tab t) {

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 1 */
  uint b = t.len; /* 15 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
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     swap(t, a, b);
               a
.len | 15
             13 5
                          11
                                    14 | 2 | 10
                                                 12
```

8

10 11

3

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  int pivot = t.val[(t.len-1)/2]; /* 9 */
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  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                       h
               а
.len 15
              13
                                       2
                                                12
                 5
                     0
                          11
                                    14
                                          10
                                              1
```

6

8

10 11

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 1 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
               a
.len | 15
              13 5
                                       2 | 10
                                                 12
                     0
                          11
                                    14
                                              1
                     3
                           5
                              6
                                7
                                     8
                                           10
                                              11
```

```
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  uint a = -1; /* 1 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
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    if (a >= b) { return b; }
     swap(t, a, b);
                                                       h
               а
.len 15
              13
                                       2
                                                12
                 5
                     0
                          11
                                    14
                                          10
                                              1
                          5
```

8

10 11

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 1 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
    swap(t, a, b);
                                                       h
               a
.len 15
             13
                                       2 | 10
                                                12
                          11
                                 9
                                    14
                                              1
                    3
                           5
                              6
                                7
                                    8
                                          10
                                             11
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 1 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
               a
.len 15
                          11
                                    14 | 2 | 10
                                                 12
                                              1
                     3
                           5
                              6
                                7
                                    8
                                           10
                                              11
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 1 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
               а
.len | 15
                                        2 | 10
                                                 12
                  5
                           11
                                    14
                                              1
```

8

10 11

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 2 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
                  а
.len | 15
                          11
                                                 12
                  5
                     0
                                  9
                                    14
                                          10
                                              1
```

6

8

10 11

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 2 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
                  а
.len | 15
                           11
                                                 12
                                    14
                                          10
                                               1
                     3
                           5
                               6
                                     8
                                           10
                                              11
```

```
int pivot = t.val[(t.len-1)/2]; /* 9 */
 uint a = -1; /* 3 */
 uint b = t.len; /* 14 */
 while (1) {
   do { a++; } while (t.val[a] < pivot);</pre>
   do { b--; } while (t.val[b] > pivot);
   if (a >= b) { return b; }
    swap(t, a, b);
                                                        h
                     а
.len | 15
                                                12
                 5
                     0
                          11
                                    14
                                          10
                                              1
```

6

8

10 11

3

uint partition (Tab t) {

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 3 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
                     а
.len | 15
                                                 12
                           11
                                    14
                                           10
                                               1
                    3
                           5
                               6
                                     8
                                           10
                                              11
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 4 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                        a
.len | 15
                                                 12
```

5 6

3

.val

14

8

10 1

10 11 h

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 4 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
                        a
.len | 15
                           11
                                                 12
                                    14
                                           10
                                               1
                     3
                           5
                                     8
                                           10
                                              11
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 5 */
  uint b = t.len; /* 14 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                        h
                           a
.len | 15
                                    14
                                                 12
                  5
                     0
                           11
                                          10
                                              1
```

6

8

10 11

3

```
uint partition (Tab t) {
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                                                        h
                            a
.len | 15
                                    14
                                        2 | 10
                                                 12
                  5
                                               1
                     3
                        4 5
                                     8
                                           10
                                              11
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 5 */
  uint b = t.len; /* 13 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                     h
                           a
.len | 15
                                    14
                                        2
                  5
                     0
                           11
                                          10
                                              1
                                                 12
```

6

8

10 11

3

```
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     swap(t, a, b);
                                                    h
                           a
.len | 15
                                    14 2 10
                          11
                                                 12
                          5
                    3
                              6
                                7
                                    8
                                          10
                                              11
```

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                                                     h
                           a
.len | 15
                                    14
                                        2
                  5
                     0
                           11
                                          10
                                              1
                                                 12
```

8

10 11

3

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    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
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                                                     h
                           a
.len | 15
                                    14 2 10
                                                 12
                  5
                     3
                        4 5
                              6
                                     8
                                           10
                                7
                                              11
.val
```

```
uint partition (Tab t) {
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  uint a = -1; /* 5 */
  uint b = t.len; /* 13 */
  while (1) {
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    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                     h
                           a
.len | 15
                                    14 2 10
                                                 12 11 13
                  5
                                              1
                                 7
                    3
                        4 5
                                     8
                                           10
                                             11
                                                 12 13 14
.val
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 5 */
  uint b = t.len; /* 13 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                     h
                            a
.len | 15
                                     14
                                        2
                                                  12 | 11 | 13
            3
                  5
                     0
                            8
                                           10
                                               1
```

8

10 11 12

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 6 */
  uint b = t.len; /* 13 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                      h
                               а
.len | 15
                                     14
                                        2 | 10
                                                  12 | 11 | 13
            3
                  5
                                               1
```

8

10 11 12

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 6 */
  uint b = t.len; /* 13 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                      h
                               а
.len | 15
                                     14
                                        2 | 10 |
                                                  12 | 11 | 13
                  5
                                                1
                     3
                            5
                               6
                                      8
                                            10
                                               11
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
  uint b = t.len; /* 13 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                      h
                                  a
.len | 15
                                        2 | 10
                                                  12 | 11 | 13
            3
                  5
                                     14
                                               1
```

8

10 11 12

3

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
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    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                      h
                                  a
.len | 15
                                        2 | 10
                                                  12 | 11 | 13
                                  9 14
                                               1
                     3
                            5
                               6
                                            10
                                               11
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
  uint b = t.len; /* 12 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                   h
                                   a
.len | 15
                                         2 | 10 |
                                                  12 | 11 | 13
            3
                  5
                                     14
                                               1
```

8

10 11 12

3

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     swap(t, a, b);
                                                  h
                                  a
.len | 15
                                        2 | 10 |
                                                12 11 13
                                    14
                     3
                           5
                               6
                                7
                                     8
                                           10
                                              11 12 13
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
  uint b = t.len; /* 11 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                h
                                   a
.len | 15
                                         2 | 10
                                                  12 | 11 | 13
            3
                  5
                                     14
                                               1
                     3
                            5
                               6
                                 7
                                      8
                                            10
                                               11
```

.val

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
  uint b = t.len; /* 11 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                h
                                   a
.len | 15
                                     14 | 2 | 10 |
                                               1 | 12 | 11 | 13
                           5
                     3
                               6
                                 7
                                      8
                                            10
                                              11 12
```

```
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     swap(t, a, b);
                                                h
                                   a
.len | 15
                                         2 | 10
                                                  12 | 11 | 13
            3
                  5
                      0
                                     14
                                                1 |
                     3
                            5
                               6
                                 7
                                      8
                                            10
                                               11
                                                  12
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
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  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                               h
                                  a
.len | 15
                                               1 | 12 | 11 | 13
            3
                  5
                                    14
                     3
                           5
                               6
                                            10
                                              11 12
.val
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
  uint b = t.len; /* 11 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                              h
                                  a
.len | 15
                                          10 9 12 11 13
           3
                  5
                     3
                           5
                              6
                                           10
                                             11 12 13 14
.val
```

```
uint partition (Tab t) {
  int pivot = t.val[(t.len-1)/2]; /* 9 */
  uint a = -1; /* 7 */
  uint b = t.len; /* 11 */
  while (1) {
    do { a++; } while (t.val[a] < pivot);</pre>
    do { b--; } while (t.val[b] > pivot);
    if (a >= b) { return b; }
     swap(t, a, b);
                                                h
                                   а
                                  1
.len | 15
                                         2 | 10
                                                  12 | 11 | 13
            3
                  5
                      0
                                     14
                                               9 |
                     3
                            5
                               6
                                 7
                                      8
                                            10
                                               11
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                                         2 | 10 |
                                                  12 | 11 | 13
            3
                  5
                      0
                                  1
                                     14
                                                9 |
```

8

10 11

3

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                                           h
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                                                 12 | 11 | 13
            3
                  5
                                  1
                                     14
                                        2
                                          10
```

8

10 11 12

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                                            h
                                     а
                                               9 | 12 | 11 | 13
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                     3
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                                                 12 | 11 | 13
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```

5 6

10 11

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                                     a b
.len | 15
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7

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                                                  12 | 11 | 13
            3
                  5
                                     2
                                       14 | 10 |
```

5 6 7 8

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