



et al.

chop binary search half-interval search logarithmic search binary

Procedure

*Author correspondence

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Received 29-10-2018; accepted 02-07-2019



```
function
```

```
    while
```

```
        if
```

```
            else
```

```
            else
```

```
    return
```

Duplicate elements

Alternative procedure

Procedure for finding the leftmost element

```
function
```

```
    while
```

```
        if
```

```
            else
```

```
    if
```

```
        return
```

```
    return
```

```
function
```

```
    while
```

```
        if
```

```
            else
```

```
    return
```

Procedure for finding the rightmost element



```
external path
external
```

path length

Performance of alternative procedure

Unsuccessful searches

external nodes
tended binary tree

ex-

Running time and cache use



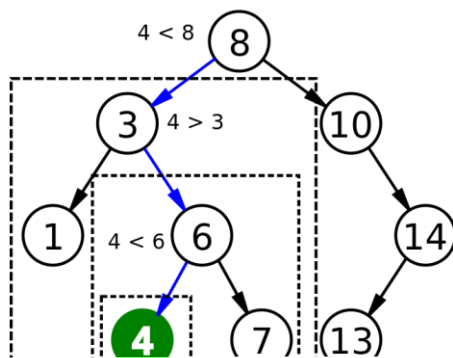


Figure 4 |

Chris Martin, public domain

Other data structures

Hashing

Uniform binary search

Main article: [Uniform binary search](#)

Set membership algorithms

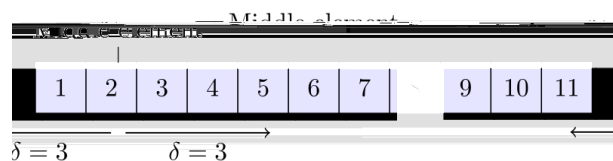


Figure 5 |

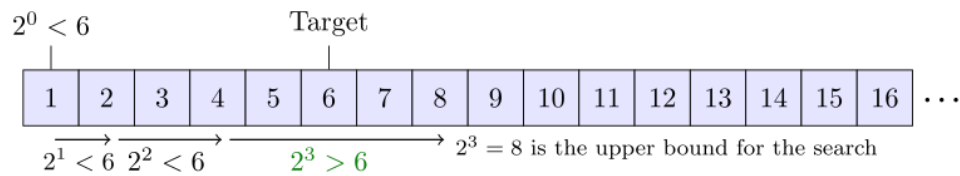


Figure 6 |

Exponential search

Main article: [Exponential search](#)

Fractional cascading

Main article: [Fractional cascading](#)

Interpolation search

Main article: [Interpolation search](#)

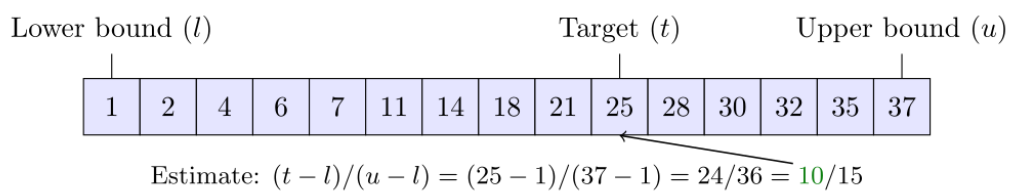


Figure 7 |

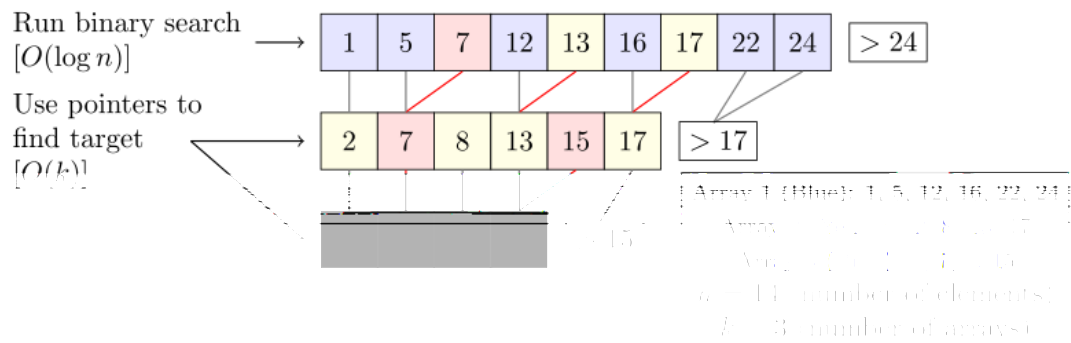


Figure 8 |

Generalization to graphs

Quantum binary search

exact

Noisy binary search



Although the basic idea of binary search is comparatively straightforward, the details can be surprisingly tricky ... — Donald Knuth^[2]

Programming Pearls



Acknowledgements

internal path

internal path length

—

after

external path

Willams, Jr., Louis F. (22 April 1976). *A modification to the half-interval search (binary search) method*. *Proceedings of the 14th ACM Southeast Conference*. ACM. pp. 95–101. doi:[10.1145/503561.503582](https://doi.org/10.1145/503561.503582). Retrieved 29 June 2018.

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86094-635-6 Knuth, Donald Programming 1 ISBN 978-0-201-89683-1 Knuth, Donald Programming 3 ISBN 978-0-201-89685-5	ISBN 978-1- The Art of Computer	doi 10.1007/978-1-4615-0935-6 ISBN 978-0-7923-7668-2 Sedgewick, Robert	ISBN 978-0-321- 57351-3 Stroustrup, Bjarne 56384-2
	The Art of Computer		ISBN 978-0-321-