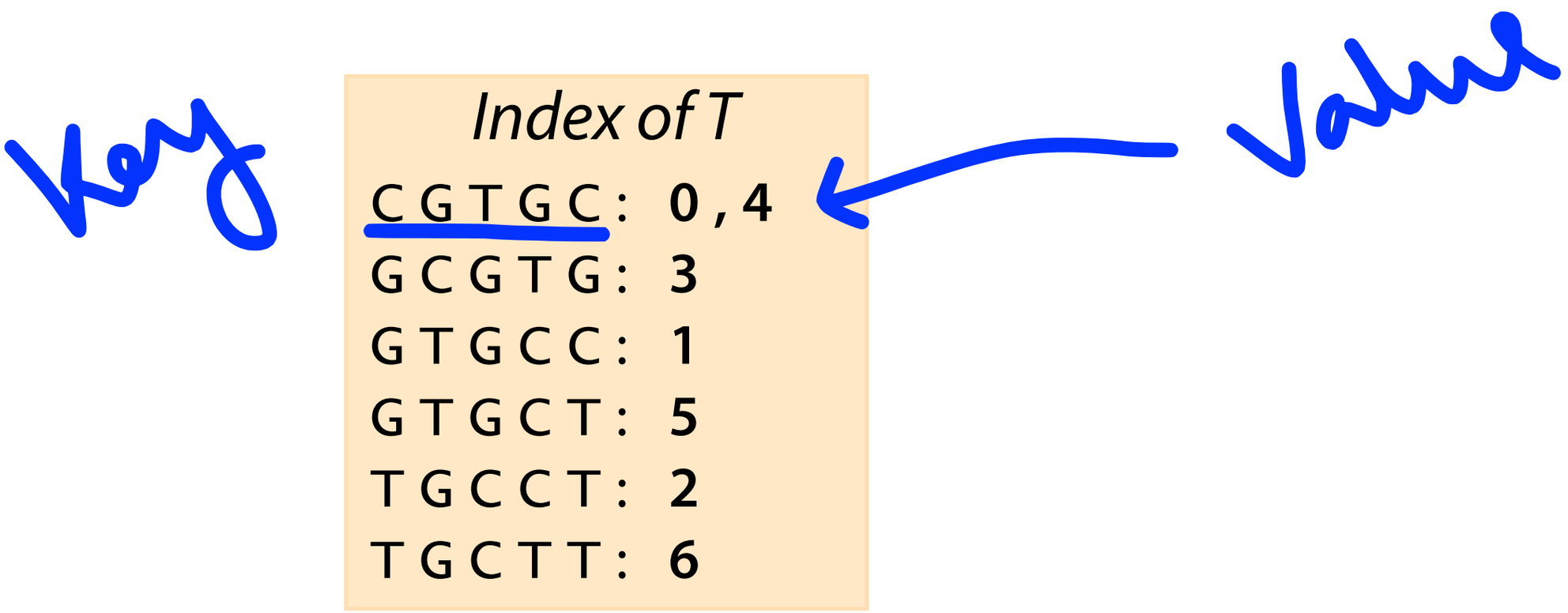
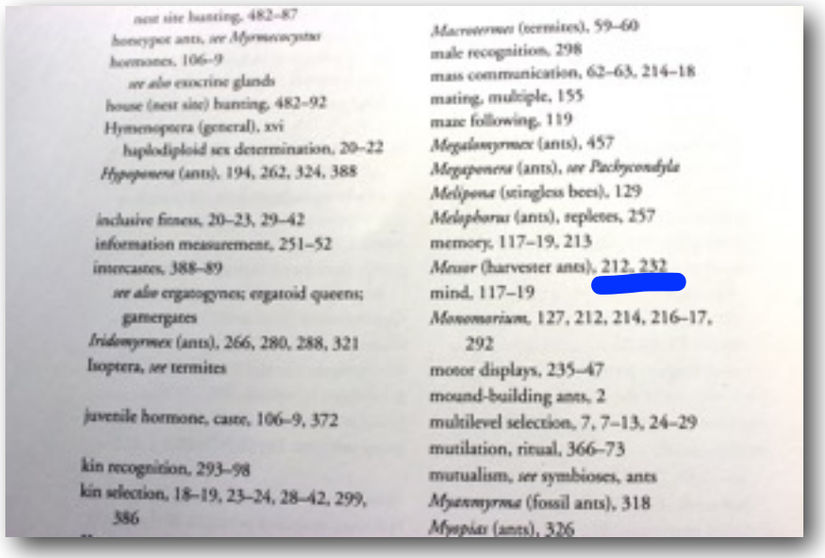
Data structures



Multimap

T: C G T G C G T G C T T

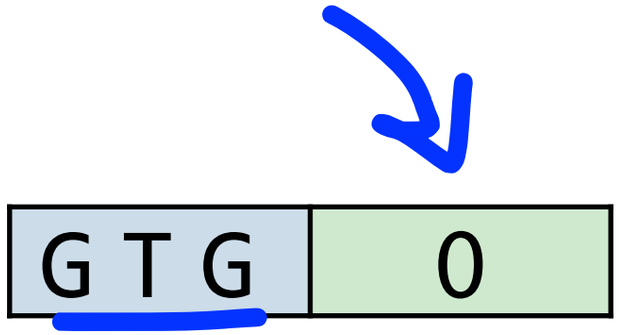
Data structures



Multimap

T: C G T G C G T G C T T

Data structures



T: G T G C G T G T G G G G

Data structures

G T G	0
T G C	1

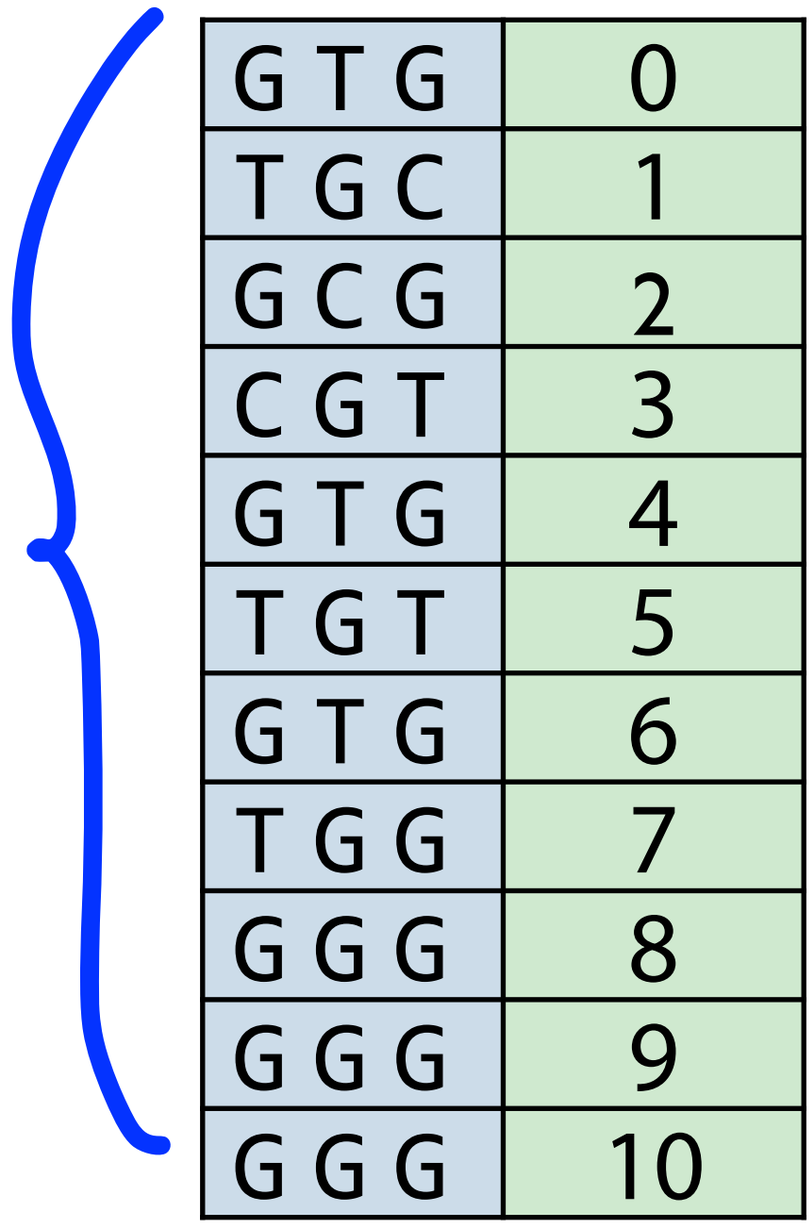
T: G T G C G T G T G G G G

Data structures

G T G	0
T G C	1
G C G	2

T: G T G C G T G T G G G G G

Data structures



G T G	0
T G C	1
G C G	2
C G T	3
G T G	4
T G T	5
G T G	6
T G G	7
G G G	8
G G G	9
G G G	10

T: G T G C G T G T G G G G G

Data structures

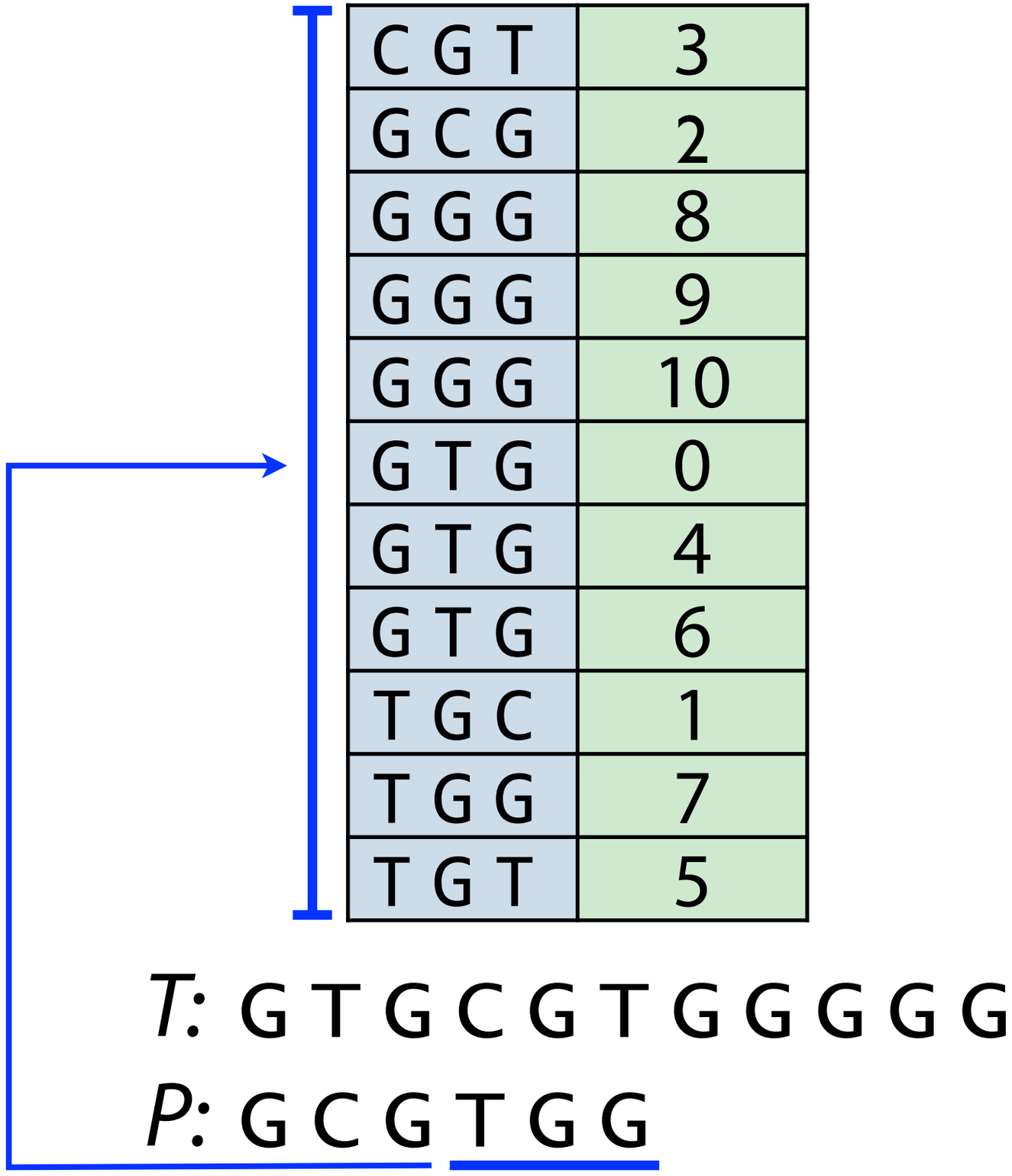
Alphabetical by k-mer

C G T	3
G C G	2
G G G	8
G G G	9
G G G	10
G T G	0
G T G	4
G T G	6
T G C	1
T G G	7
T G T	5

T: G T G C G T G T G G G G G

Data structures

Binary search

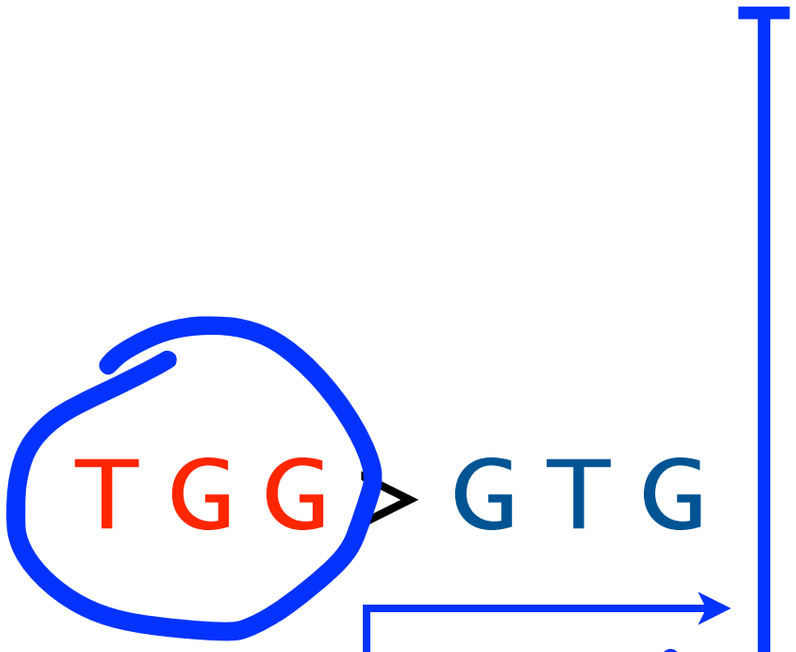


C G T	3
G C G	2
G G G	8
G G G	9
G G G	10
G T G	0
G T G	4
G T G	6
T G C	1
T G G	7
T G T	5

T: G T G C G T G G G G G

P: G C G T G G

Binary search



C G T	3
G C G	2
G G G	8
G G G	9
G G G	10
G T G	0
G T G	4
G T G	6
T G C	1
T G G	7
T G T	5

T: G T G C G T G G G G G

P: G C G T G G

Binary search

After 1st bisection

C G T	3
G C G	2
G G G	8
G G G	9
G G G	10
G T G	0
G T G	4
G T G	6
T G C	1
T G G	7
T G T	5

T G G > T G C

T: G T G C G T G G G G G

P: G C G T G G

Binary search

After 2nd bisection

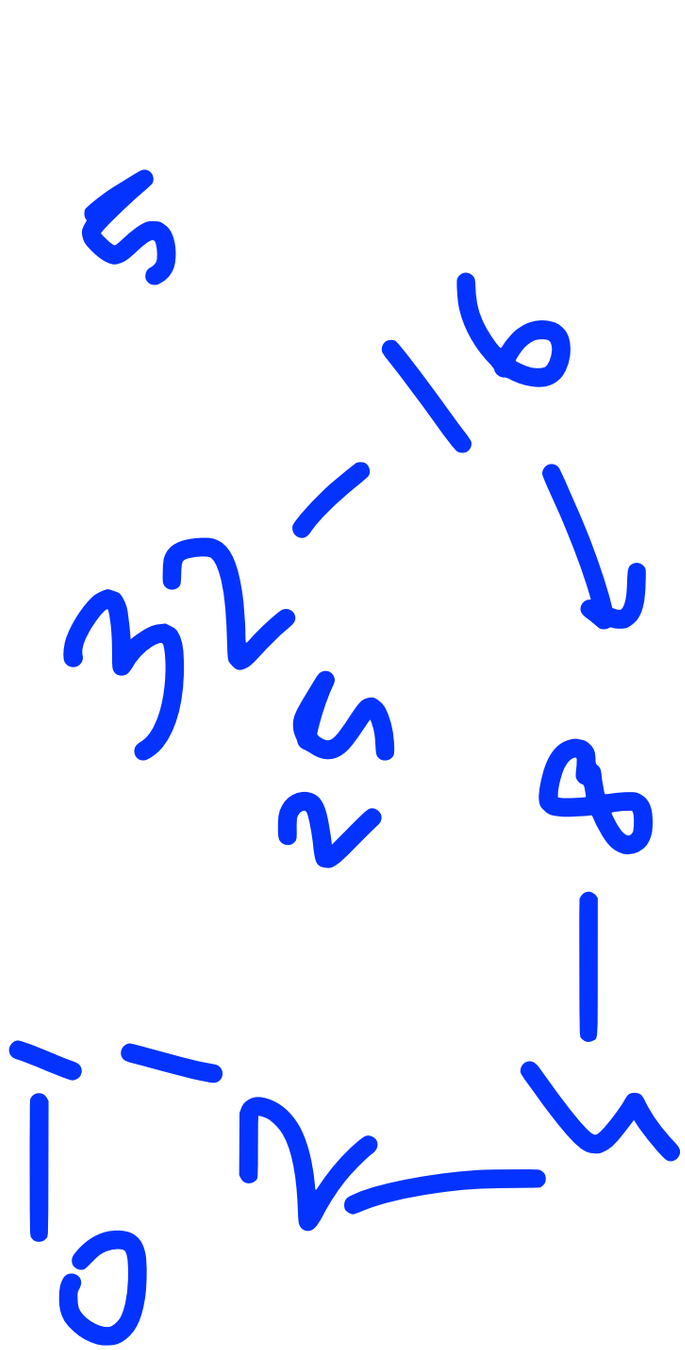
C G T	3
G C G	2
G G G	8
G G G	9
G G G	10
G T G	0
G T G	4
G T G	6
T G C	1
T G G	7
T G T	5

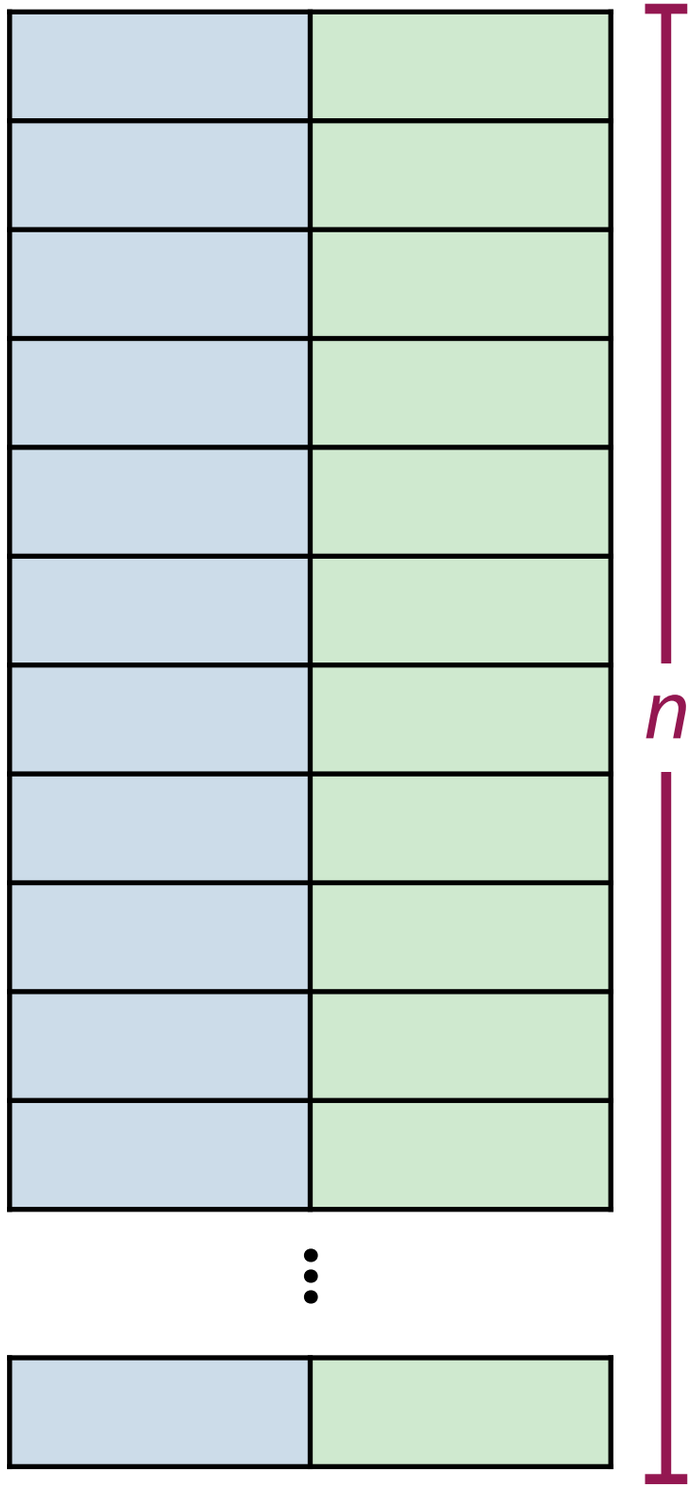
T G G = T G G

T: G T G C G T G G G G G

P: G C G T G G

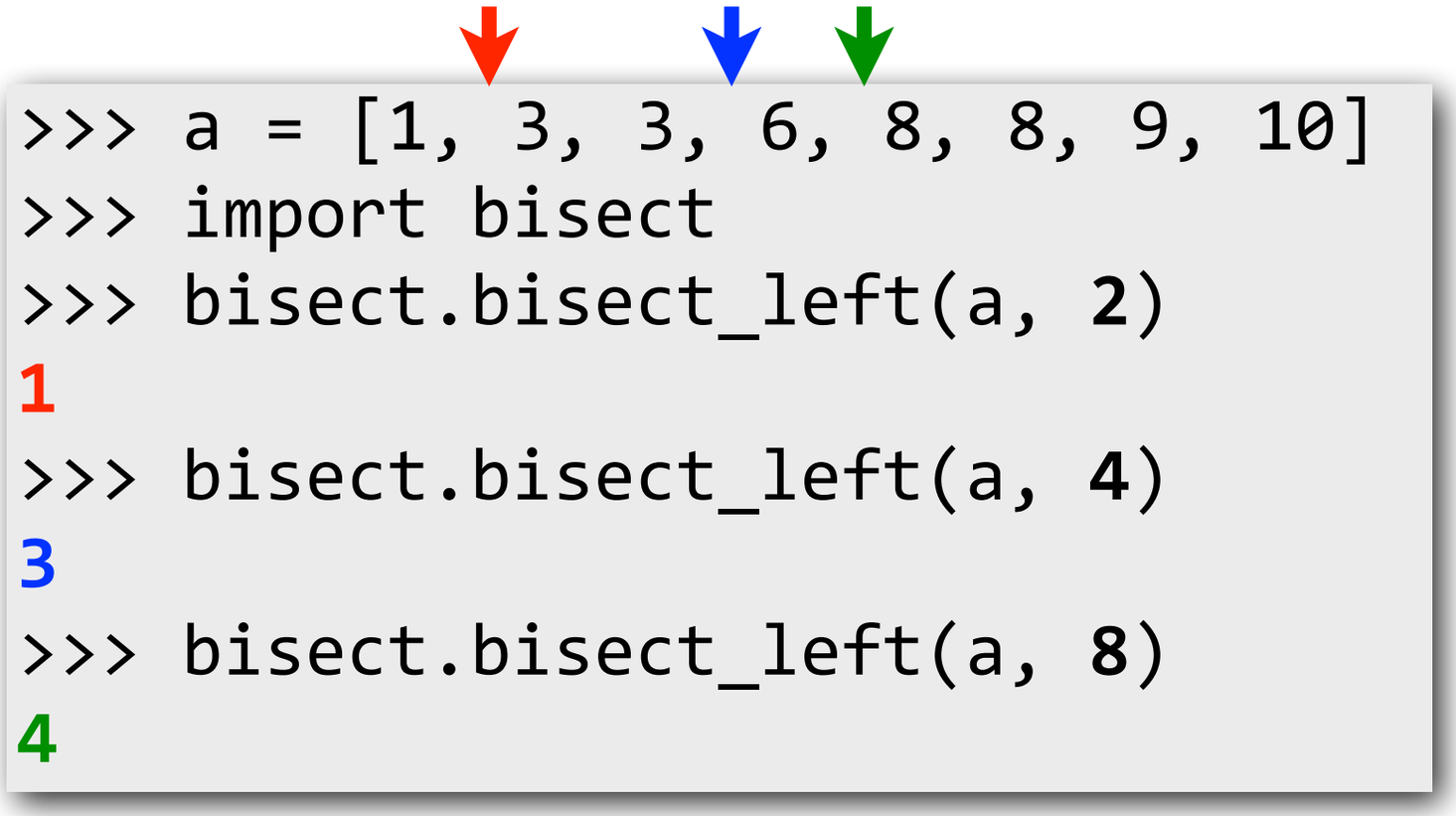
Binary search





~ $\log_2(n)$ bisections per query

`bisect.bisect_left(a, x)`: Leftmost offset where **`x`** can be inserted into **`a`** to maintain order



```
bisect_left(index, 'GTG')
```

C G T	3
G C G	2
G G G	8
G G G	9
G G G	10
G T G	0
G T G	4
G T G	6
T G C	1
T G G	7
T G T	5

T: G T G C G T G G G G G

P: G C G T G G