



Bölüm 5: Dizge Algoritmaları

Algoritmalar



Dizge Algoritmaları

- Metinlerle dolu bir dünyada yaşıyoruz.
- E-postalar, mesajlar, sosyal medya paylaşımları, haber metinleri...
- Bilgisayarlarımızda her gün sayısız metinle karşılaşırız.
- Peki, bu metinler nasıl düzenlenir ve analiz edilir?
- Dizge (String) algoritmaları,
 - metinlerde arama,
 - değiştirme,
 - karşılaştırma gibi işlemleri gerçekleştirir.



Dizge Algoritmalarının Çeşitleri

- Farklı string algoritmaları, farklı çalışma prensiplerine sahiptir.
- Brute Force (Zorlama) Arama:
 - Metnin tamamını tek tek tarayarak arama yapar (basit ama yavaştır).
- Knuth-Morris-Pratt (KMP) Algoritması:
 - Arama paternindeki tekrarlardan faydalanarak daha hızlı arama yapar.
- Boyer-Moore Algoritması:
 - Arama paterninin sonundaki karakterlerden başlayarak arama yapar.
- Rabin-Karp Algoritması:
 - Metnin ve arama paterninin hash değerlerini karşılaştırarak arar.

Brute Force - Naive



HELLO WORLD



Brute Force - Naive





Brute Force - Naive





Brute Force - Naive





Brute Force - Naive





Brute Force - Naive





Brute Force - Naive





Brute Force - Naive





Brute Force - Naive





Brute Force - Naive

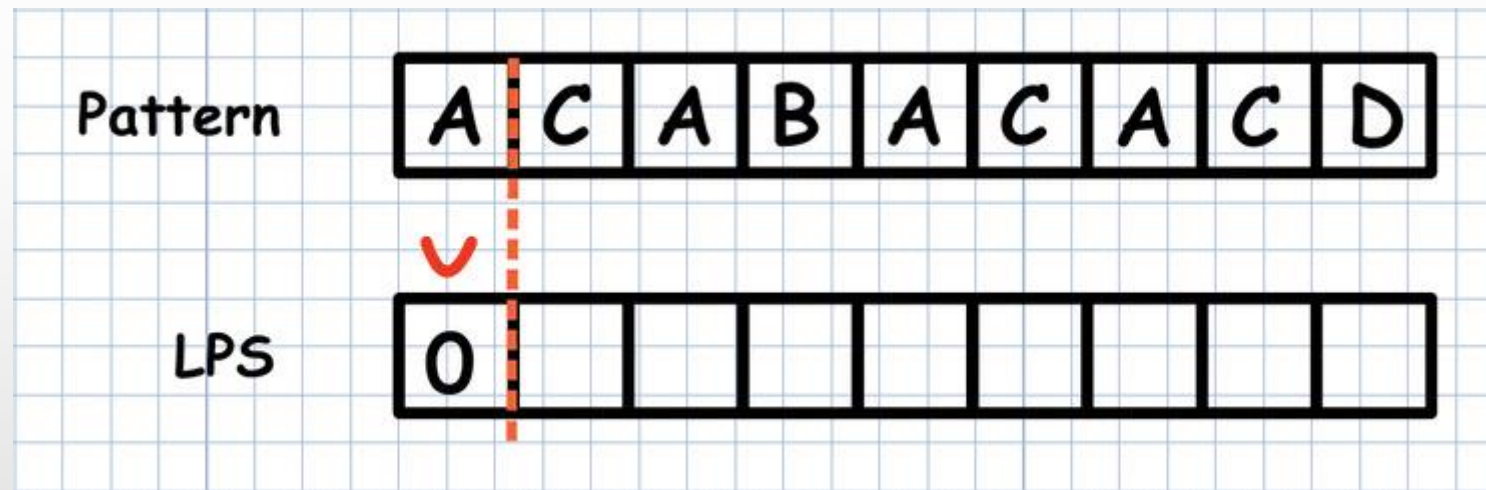






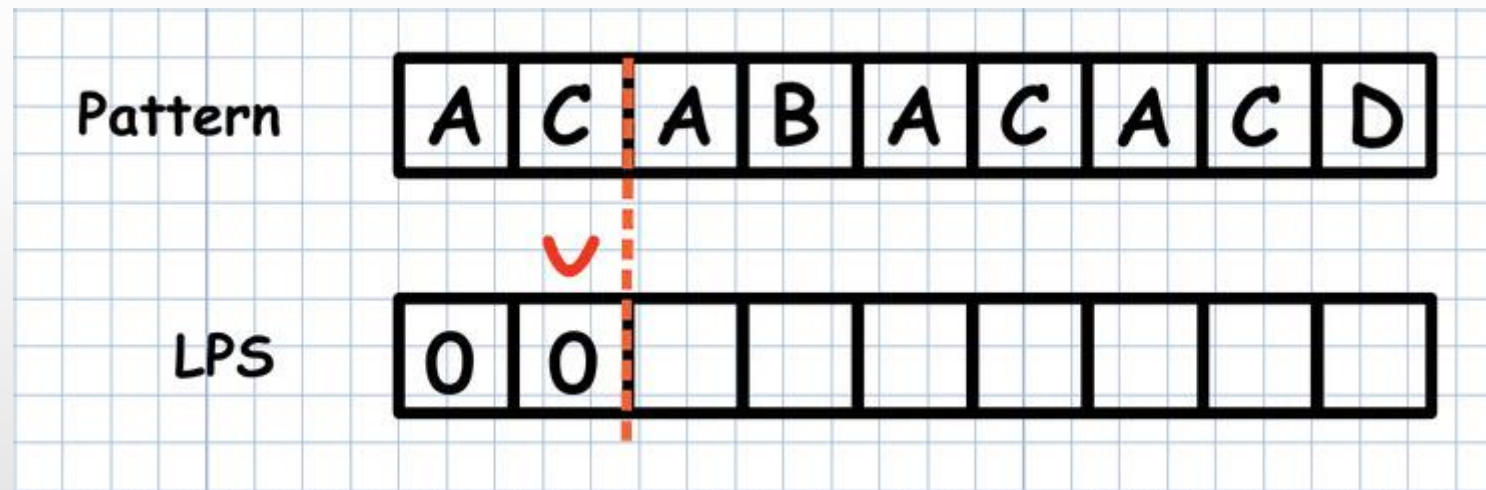
Knuth Morris Pratt

- *Longest Proper Prefix*



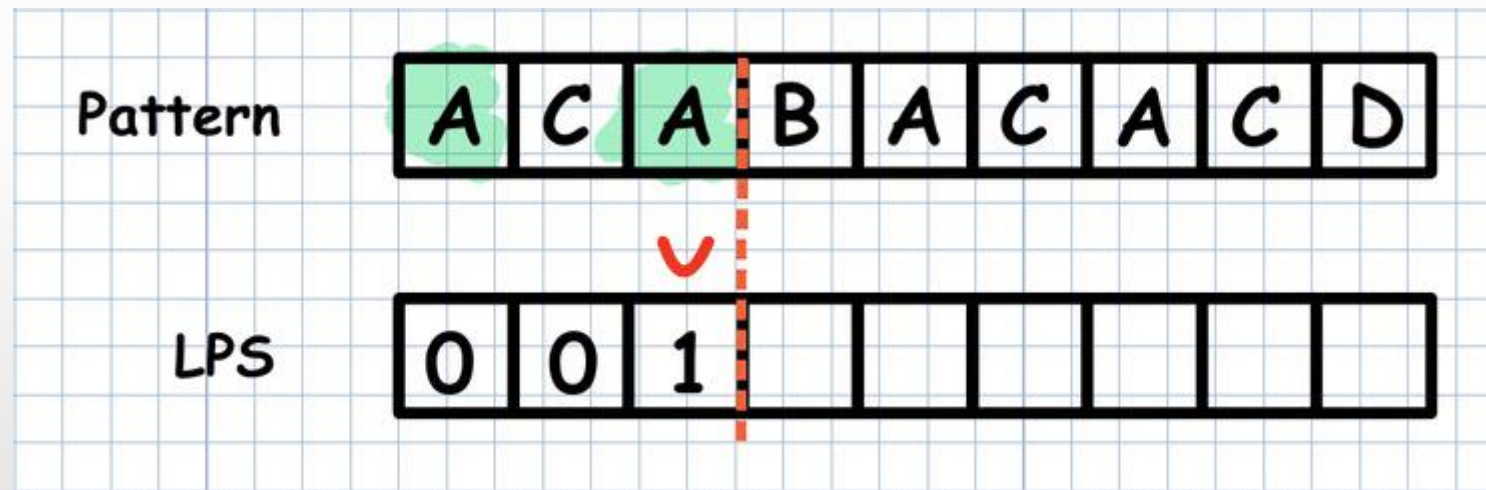


Knuth Morris Pratt



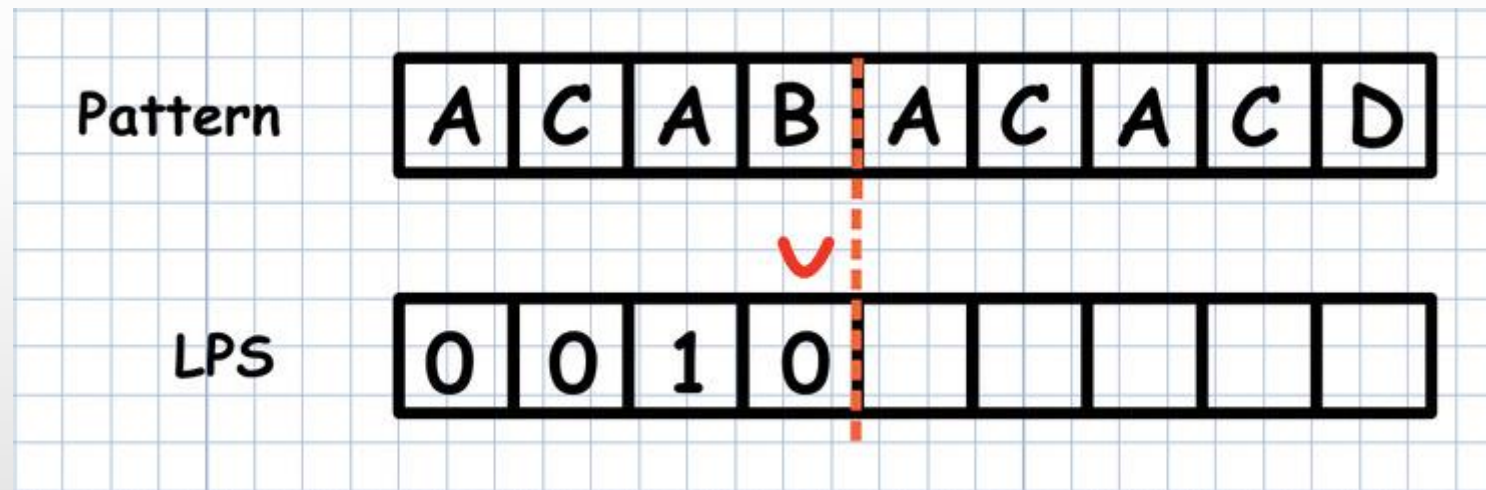


Knuth Morris Pratt



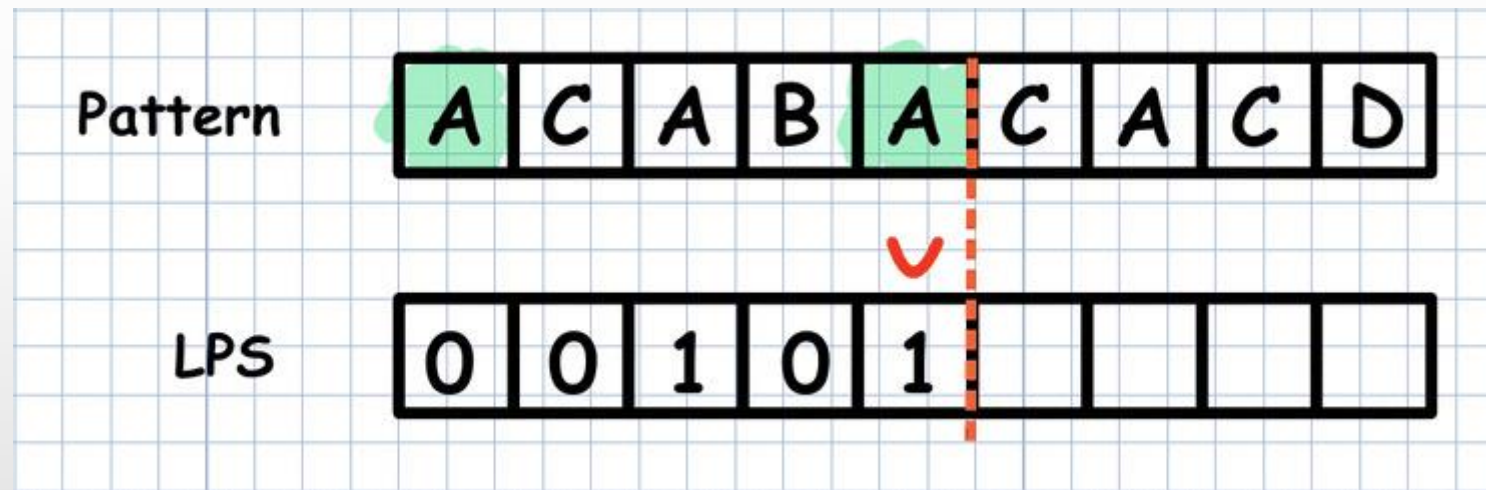


Knuth Morris Pratt



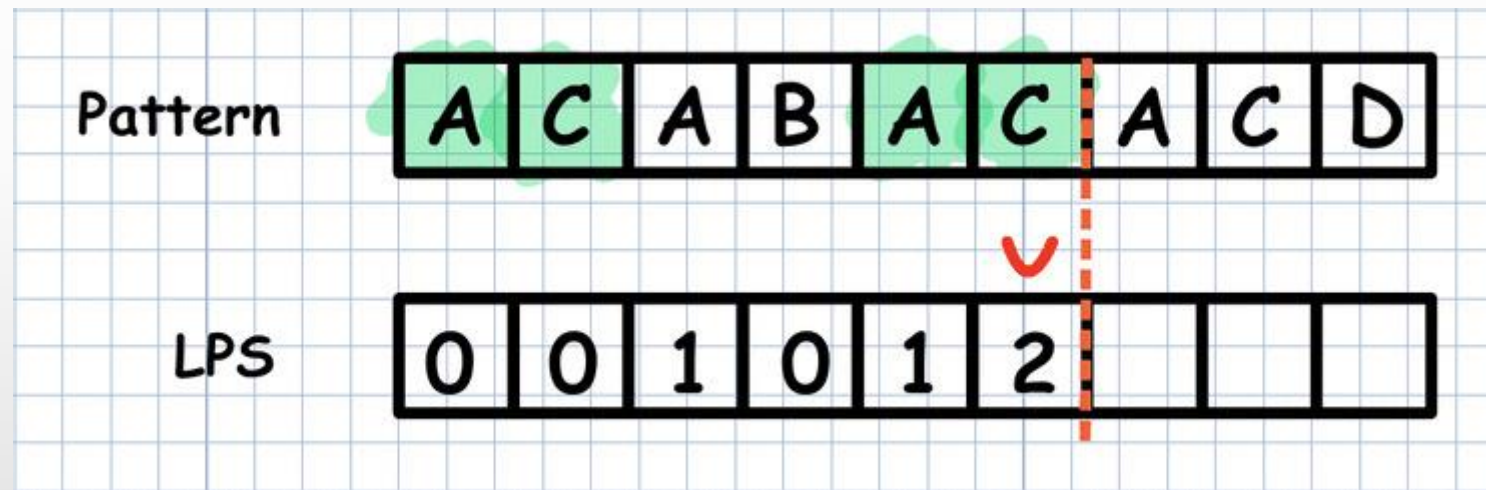


Knuth Morris Pratt



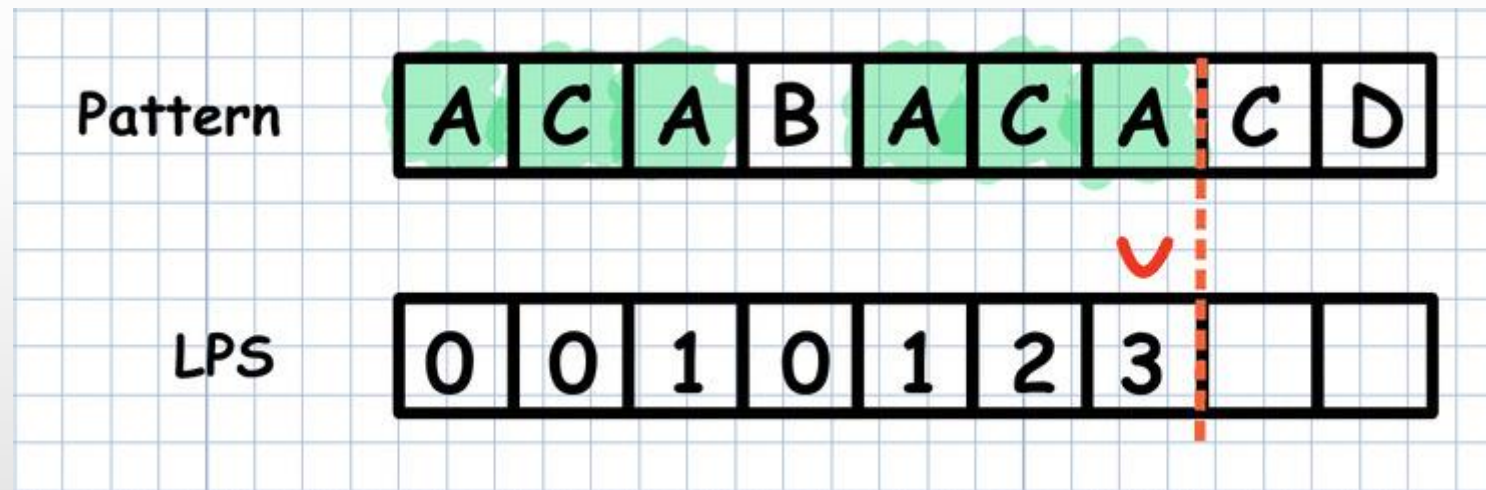


Knuth Morris Pratt





Knuth Morris Pratt





Knuth Morris Pratt

Pattern	A	C	A	B	A	C	A	C	D
LPS	0	0	1	0	1	2	3	2	

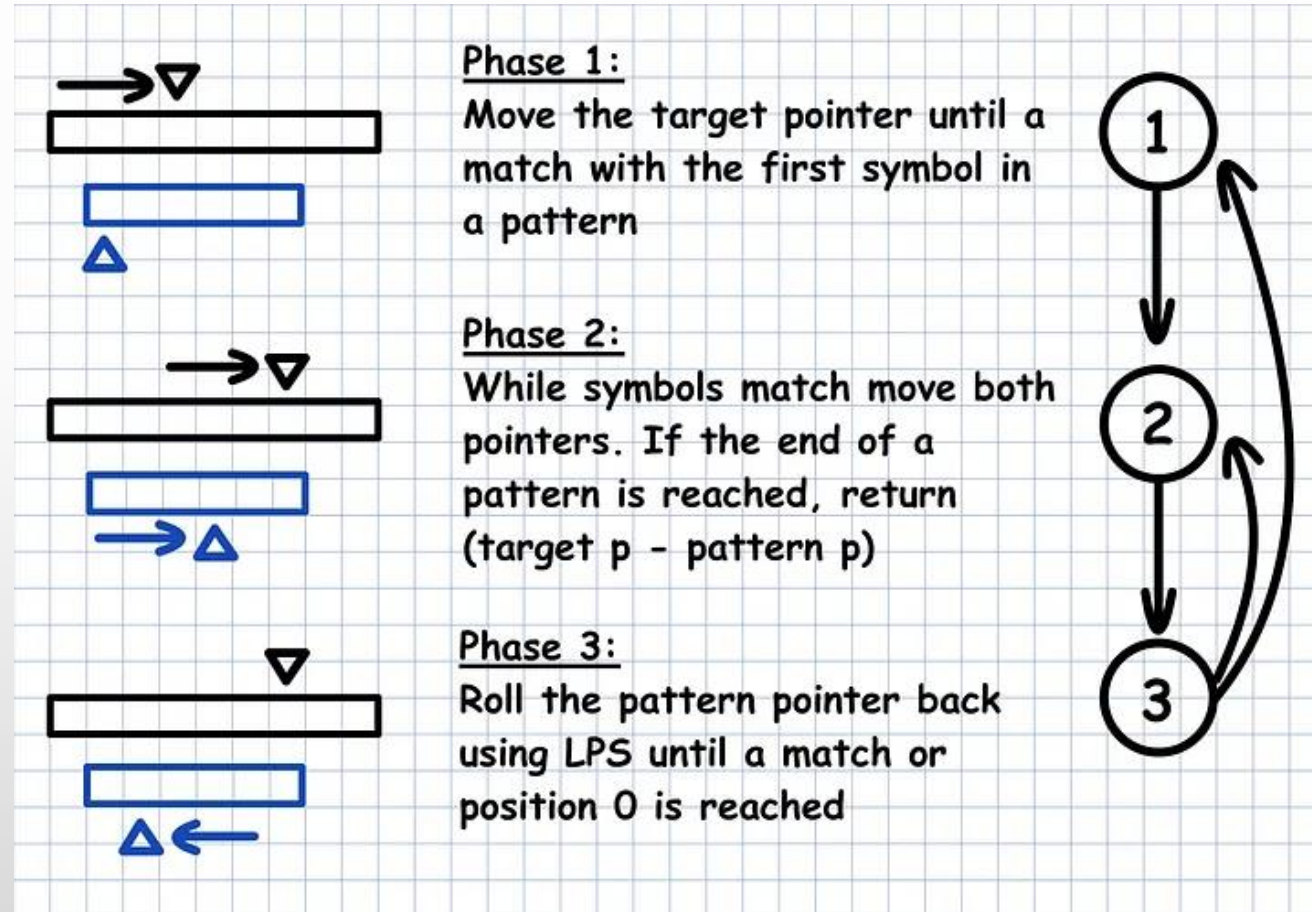


Knuth Morris Pratt

Pattern	A	C	A	B	A	C	A	C	D
LPS	0	0	1	0	1	2	3	2	0



Knuth Morris Pratt





Boyer Moore



H	E	L	L	O															
L	O		L	O	E	L	L	O		O		H	E	L	L	O			

Boyer Moore



H	E	L	L	O															
L	O		L	O	E	L	L	O		O		H	E	L	L	O			

Boyer Moore



HELLO
LO LLOELLOHELLO



Boyer Moore

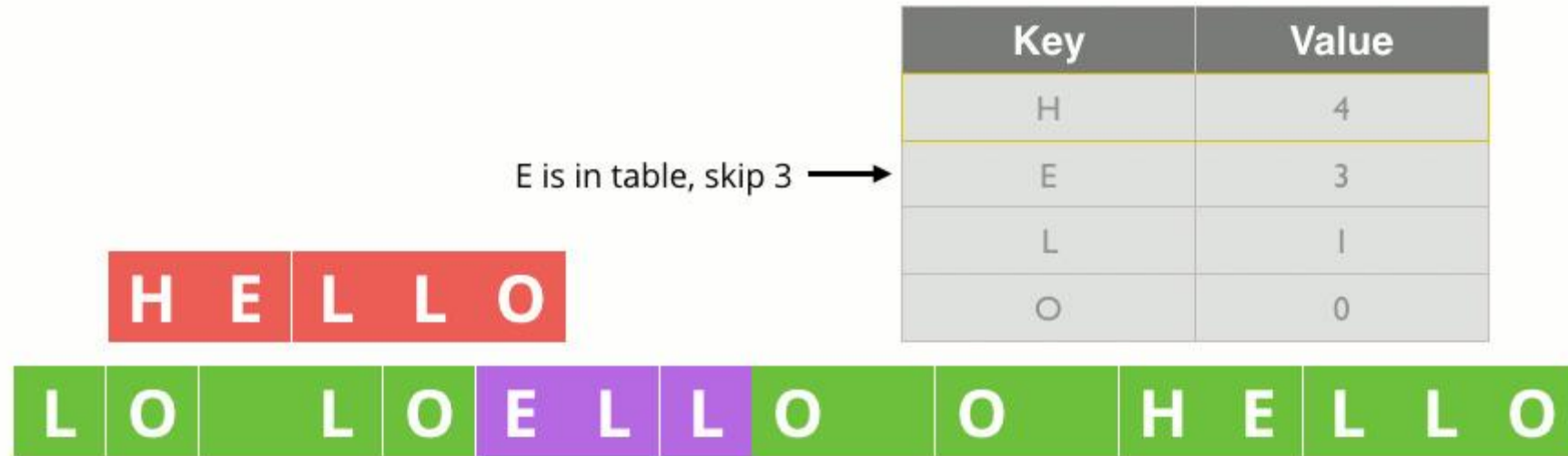


Boyer Moore



HELLO
LO L O E L L O O H E L L O

Boyer Moore



Boyer Moore



HELLO
LO LOELLO O HELLO

Boyer Moore



HELLO
LO LOELLO O HELLO

Boyer Moore



HELLO
LO LOELOLO OHELLO

Boyer Moore



HELLO
LO LOELOLO OHELLO

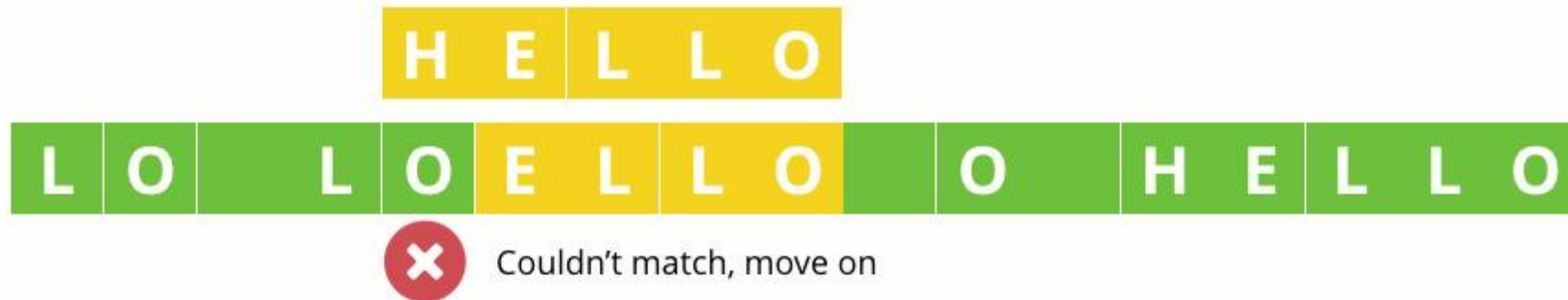
Boyer Moore



HELLO
LO LOELLO OHELLO



Boyer Moore



Boyer Moore



HELLO
LO LOELLO O HELLO

Boyer Moore



HELLO
LO LOELLOLO HELLO

Boyer Moore



HELLO
LO LOELLOLO O HELLO

Boyer Moore



HELLO
LO LOELLOLO HELLO

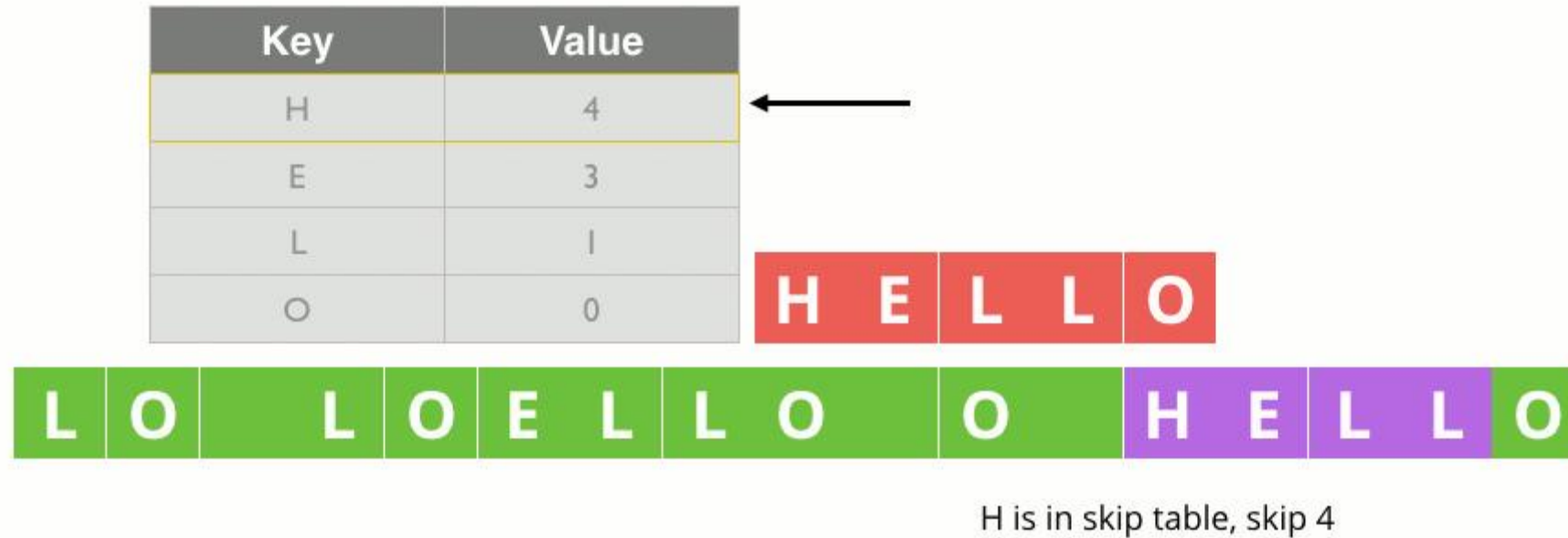
Boyer Moore



HELLO
LO LOELLOLO OHELLO



Boyer Moore



Boyer Moore



HELLO
LO LOELLOLO HELLO

Boyer Moore



HELLO
LO LOELLOLO HELLO

Boyer Moore



HELLO
LO LOELLOLO HELLO

Boyer Moore



HELLO
LO LOELLOLO HELLO

Boyer Moore



HELLO
LO LOELLOLO HELLO



1/20/2023

Boyer Moore



✓ H E L L O
L O L O E L L O O H E L L O





Rabin Karp

V U A T S

$$\underline{5} + 1 = 6$$

T S

$$2 + 3 = 5$$

1

Values

$$U = 1$$

$$T = 2$$

$$S = 3$$

$$A = 4$$

$$V = 5$$



Rabin Karp

V U A T S

$$1 + 4 = 5$$

Spurious Hit

T S

$$2 + 3 = 5$$

2

Values

$$U = 1$$

$$T = 2$$

$$S = 3$$

$$A = 4$$

$$V = 5$$

Rabin Karp



V U A T S 3

4 + 2 = 6

T S

2 + 3 = 5

Values

U = 1

T = 2

S = 3

A = 4

V = 5



Rabin Karp

V U A T S

4

Values

$$2 + 3 = 5$$

Matched !

T S

$$2 + 3 = 5$$

$$U = 1$$

$$T = 2$$

$$S = 3$$

$$A = 4$$

$$V = 5$$



SON