Compressed Communication Complexity of Longest Common Prefixes

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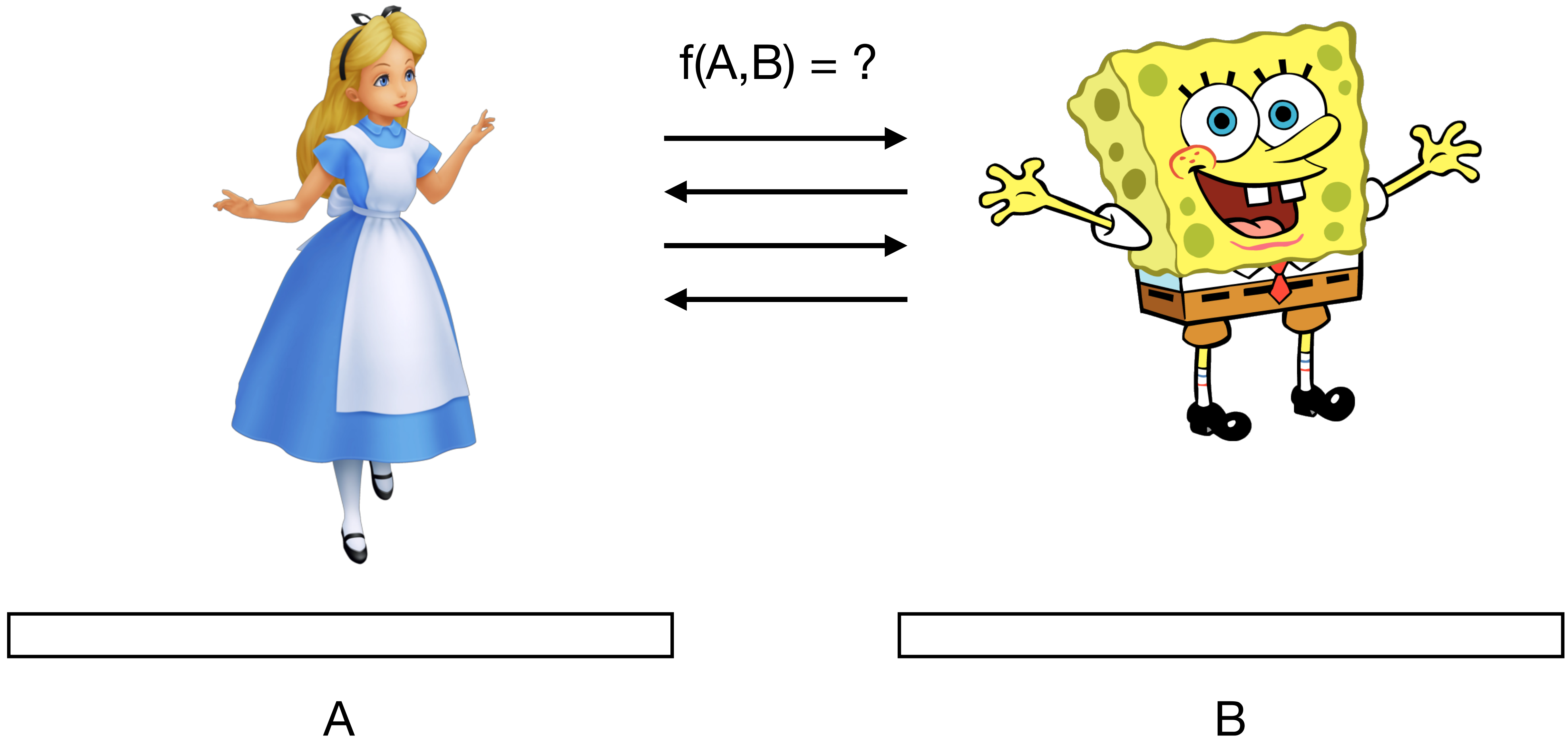
Communication Complexity

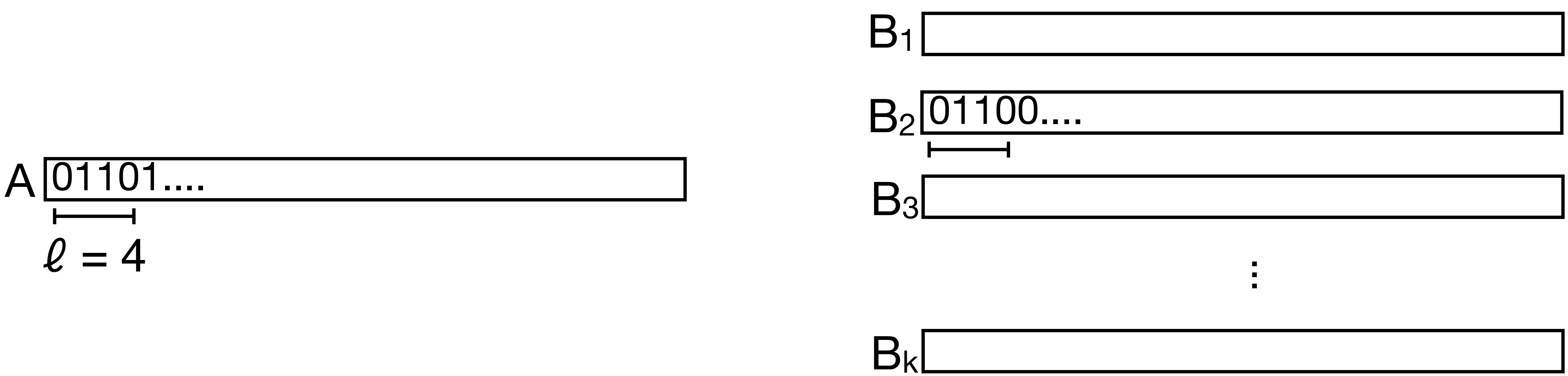


- Bits of communication and number of rounds.
- Randomized.
- Public vs. private-coin.

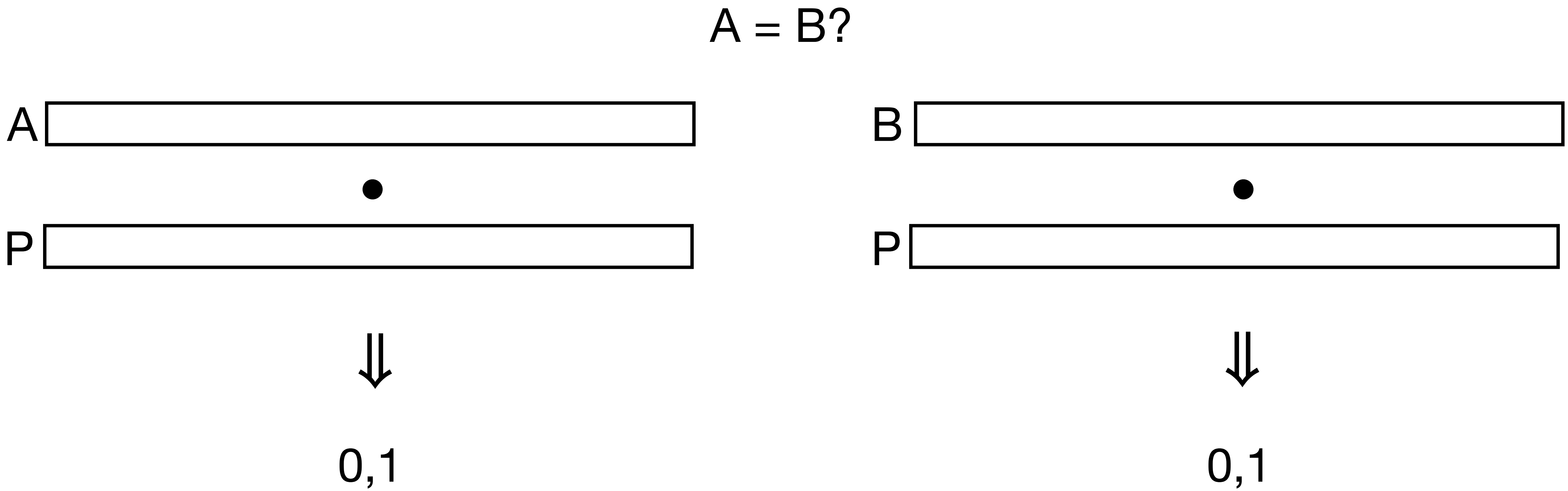
Longest Common Prefixes

$LCP(A,B)$

$LCP^k(A,B)$



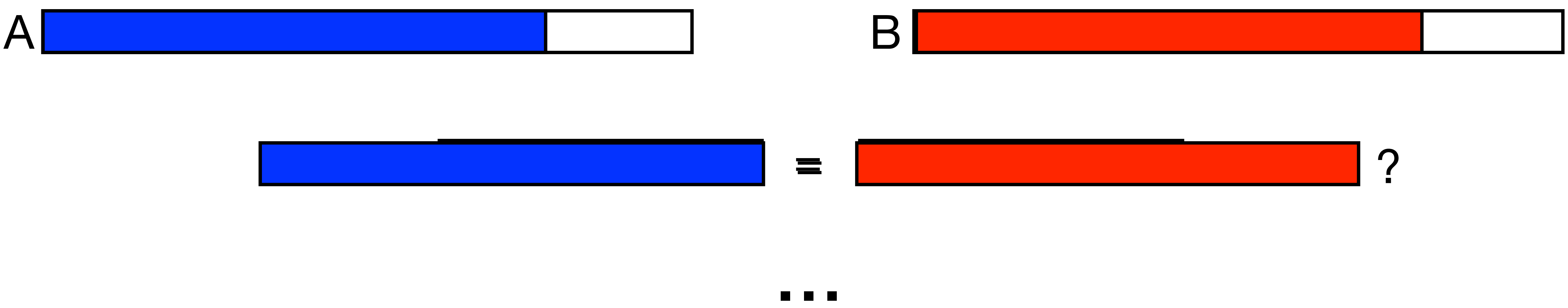
Equality



Theorem [Yao1979]. The public-coin randomized communication complexity of Equality is O(1).

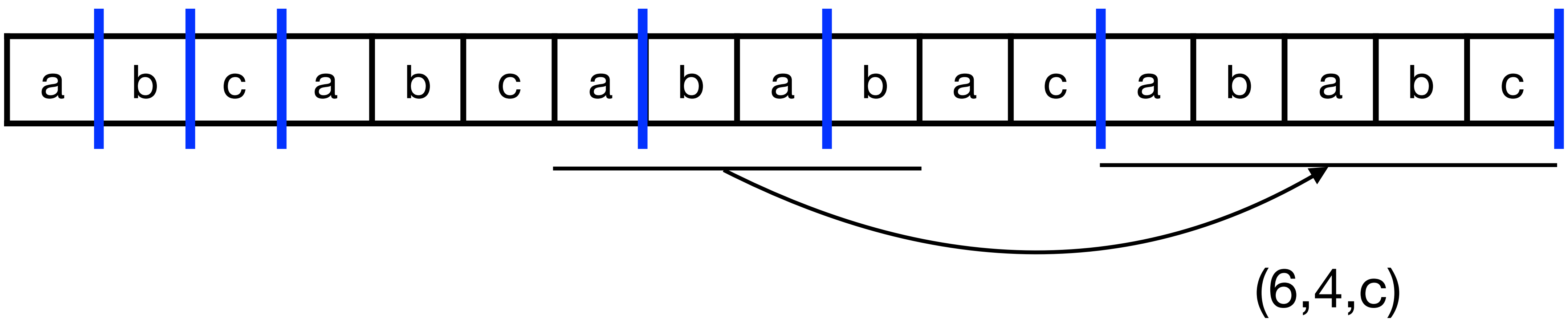
Longest Common Prefixes

LCP(A,B)



- $O(\log n)$ bits and $O(\log n)$ rounds. Optimal bound.
- Noisy binary search [FRPU1990].
- Noisy exponential search ⇒ $O(\log \ell)$ bits and $O(\log \ell)$ rounds.

Lempel-Ziv Compression



Compressed Longest Common Prefixes

LCP(A,B)

- O(log ℓ) bits and O(log z) rounds.

	communication	rounds	ref
LCP	$O(\log n)$	$O(\log n)$	[N93]
	$O(\log \ell)$	$O(\log z)$	**[new]**
with selfref.	$O(\log \ell)$	$O(\log z + \log\log \ell)$	**[new]**
	$O(\log \ell + \log\log\log \lvert A \rvert)$	$O(\log z)$	**[new]**
LCP^k	$O(\log z \log k + \log \ell)$	$O(\log z)$	**[new]**
with selfref.	$O(\log z \log k + \log \ell)$	$O(\log z + \log\log \ell)$	**[new]**
	$O(\log z \log k + \log \ell + \log\log\log \lvert A \rvert)$	$O(\log z)$	**[new]**