Rabin Fingerprinting The Hash Cannon

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@Oodrive
Architect - Backup & Archive

Data !

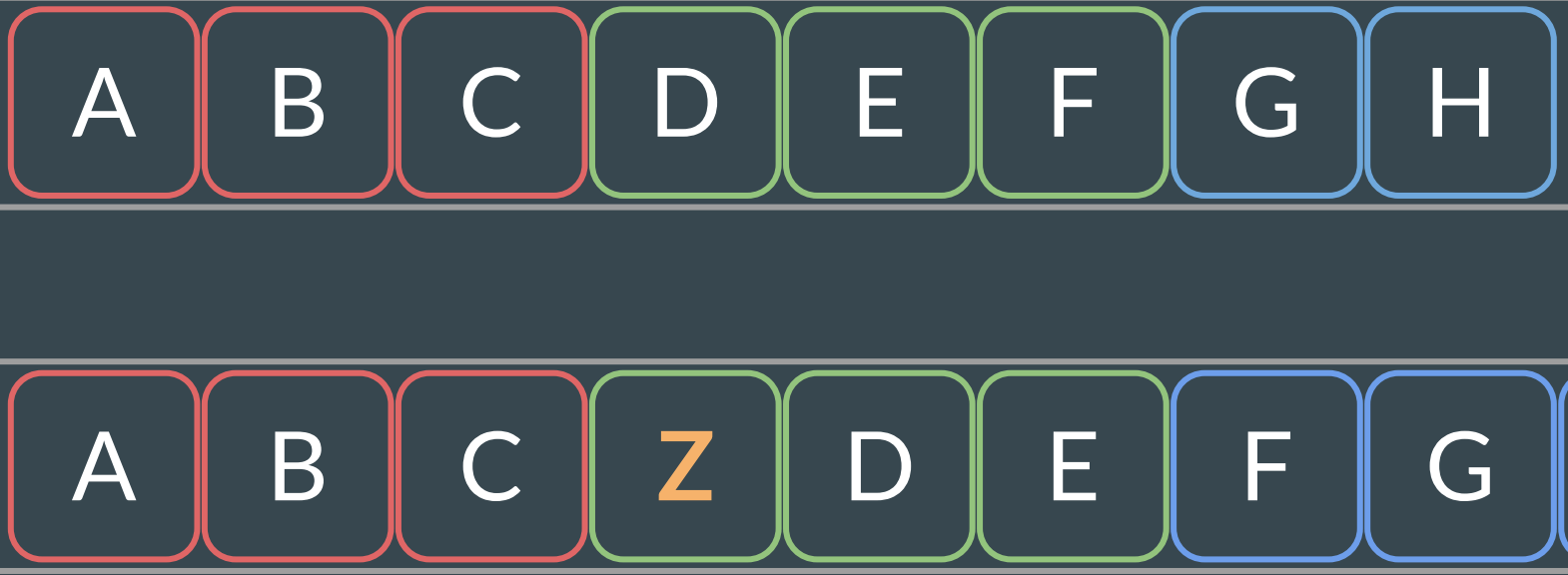
Chunks !

Chunks !

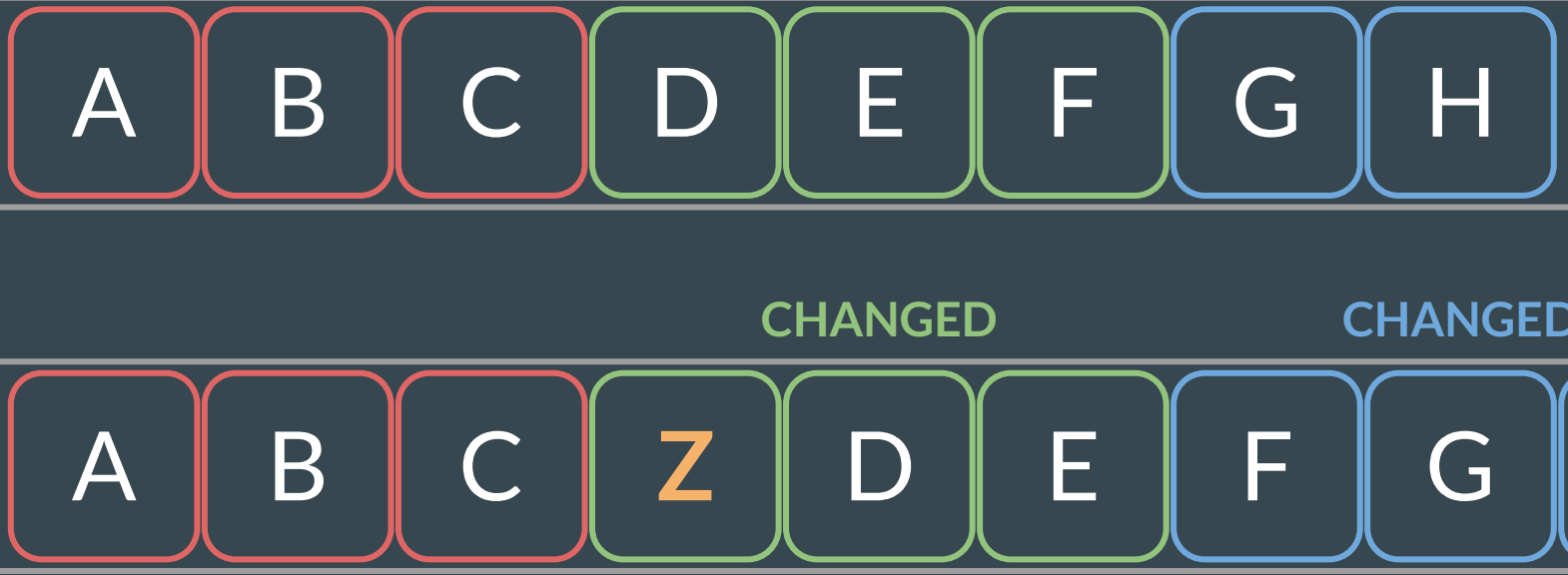
- Differential transfer
- Deduplication

Byte Shift

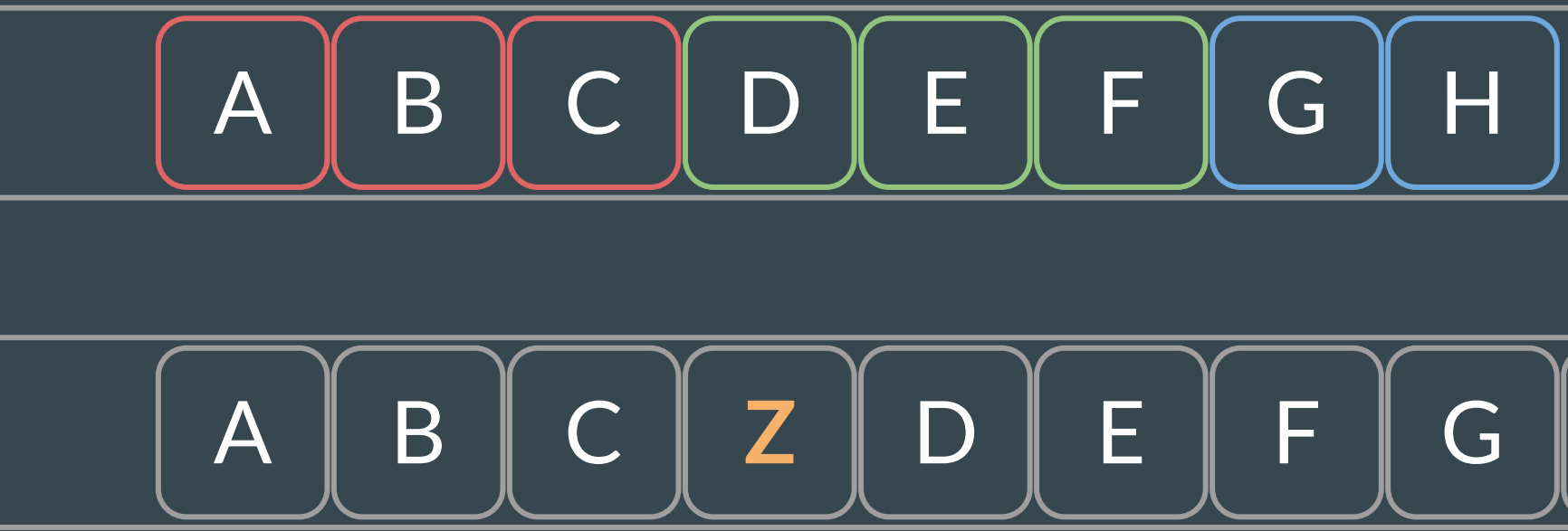
Byte Shift



Byte Shift



What would we like ?



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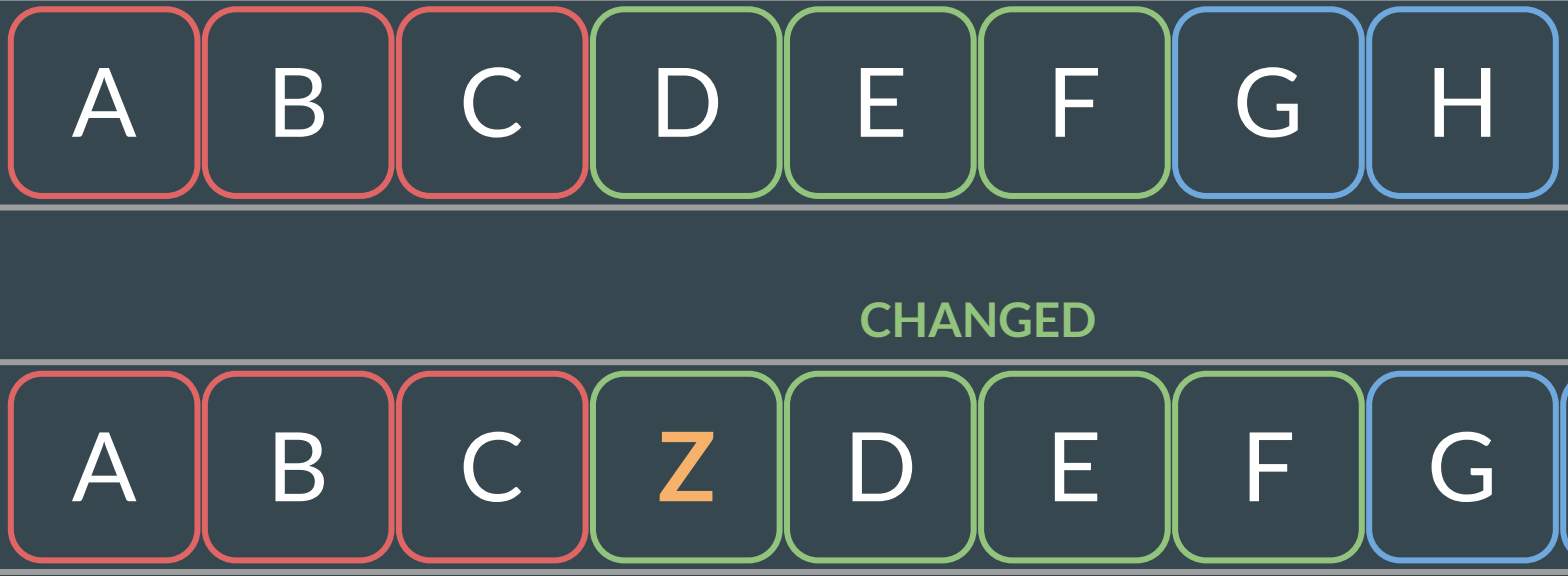


What would we like ?

- Variable chunk size
- Content based chunking

Enter Rabin !

Michael O. Rabin
1931

- Turing Award Winner 1976
- Great smile
- Loves Math, Cryptography, Hashes

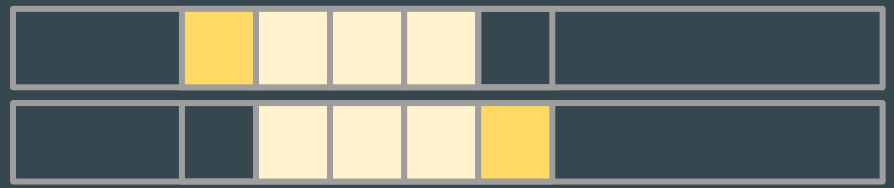
Fingerprinting

- **Hashing** function (arbitrary lengths, statistically uniform)

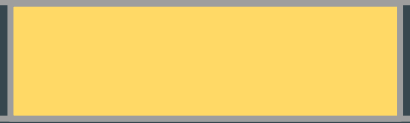
Fingerprinting

- **Hashing** function (arbitrary lengths, statistically uniform)

- **Rolling** hash



The Hash Cannon !



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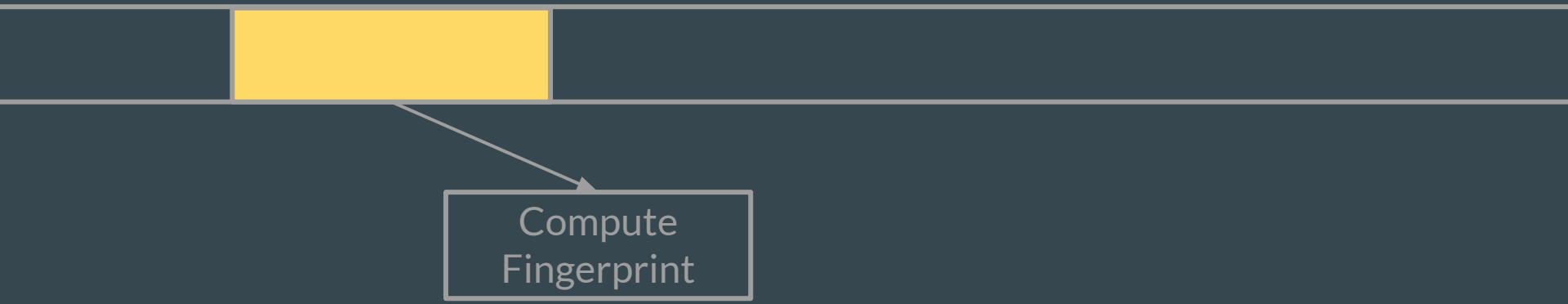

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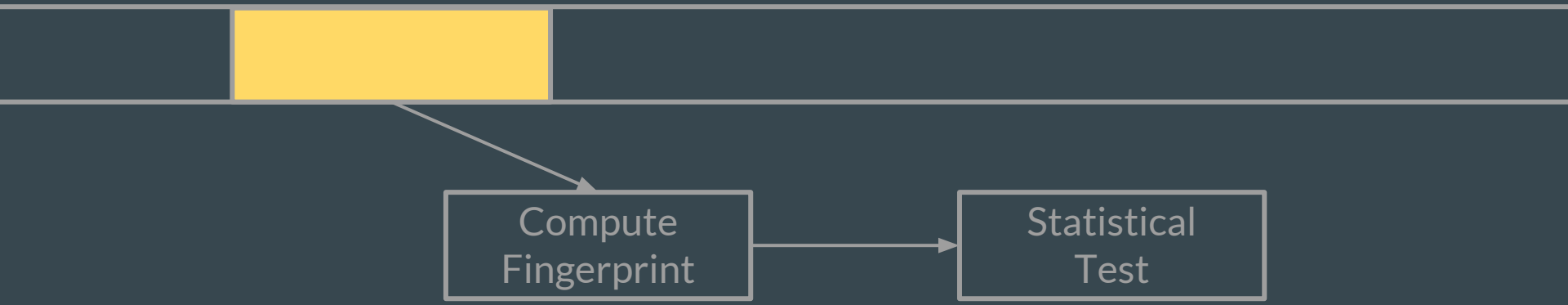

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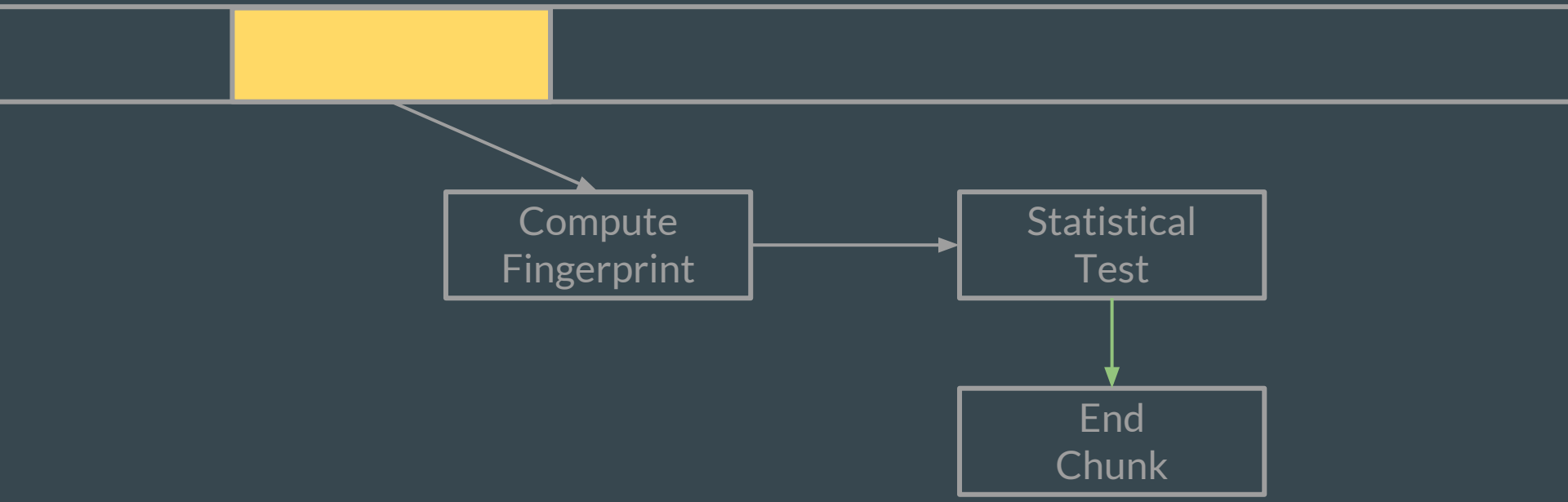

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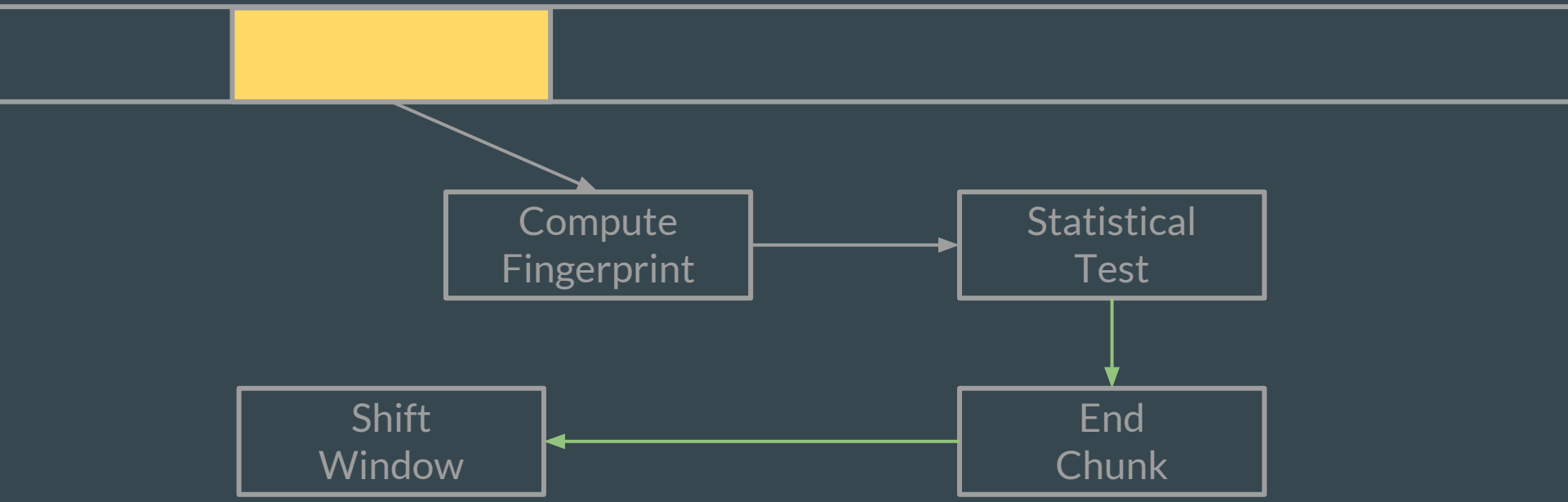

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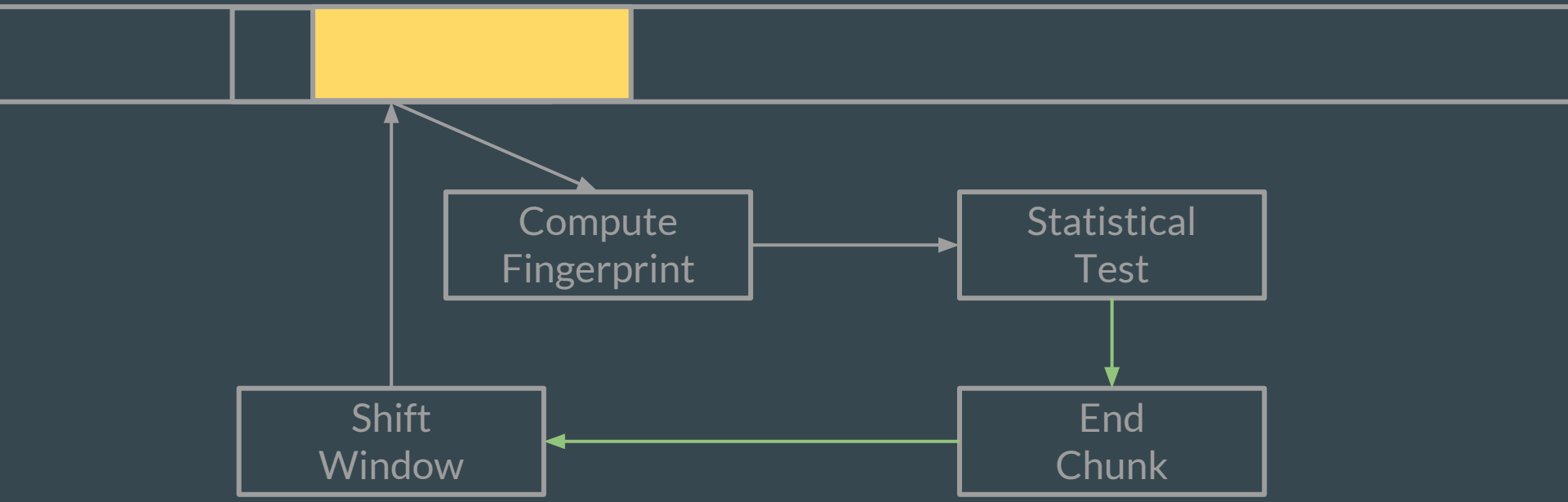

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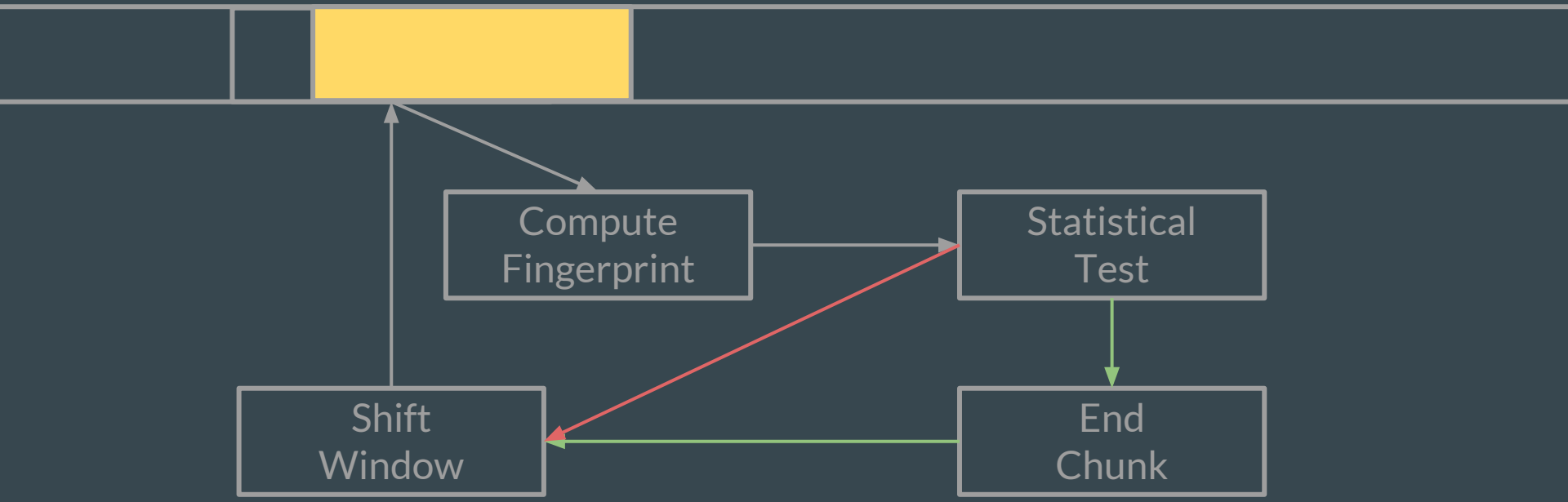
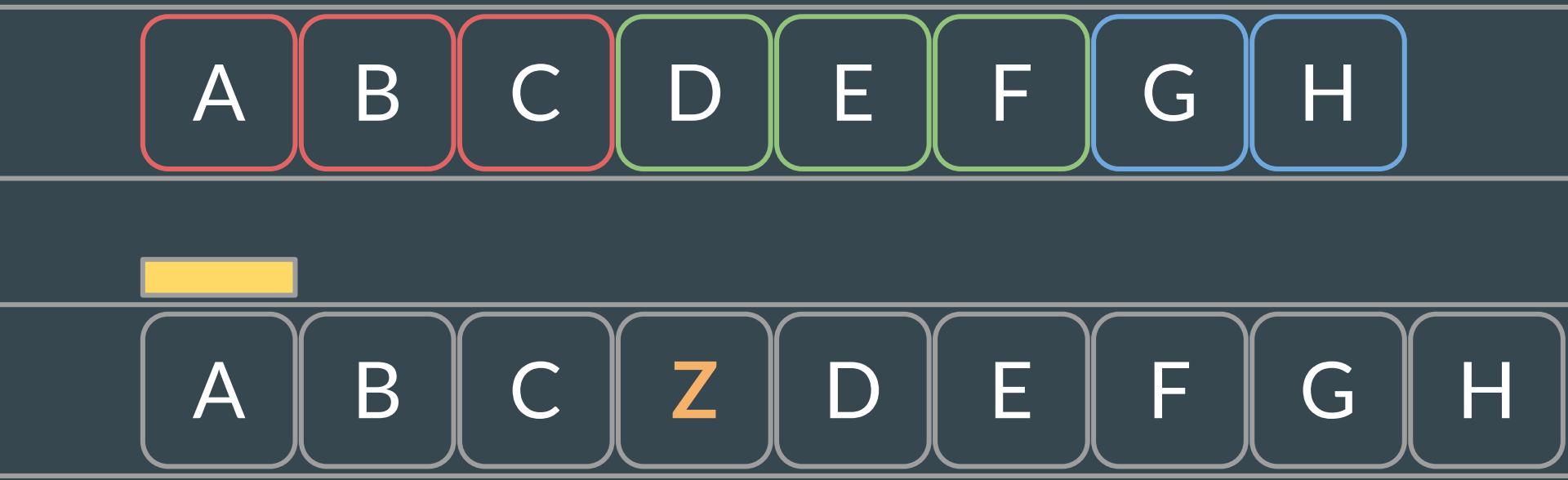


Byte Shift (again)



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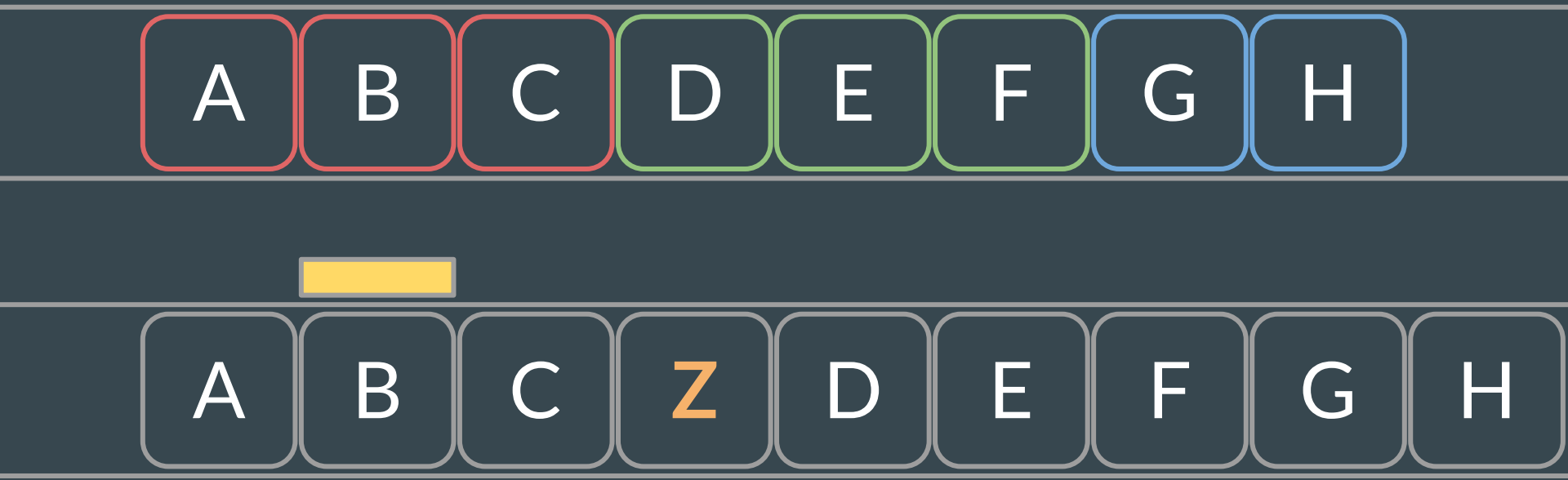
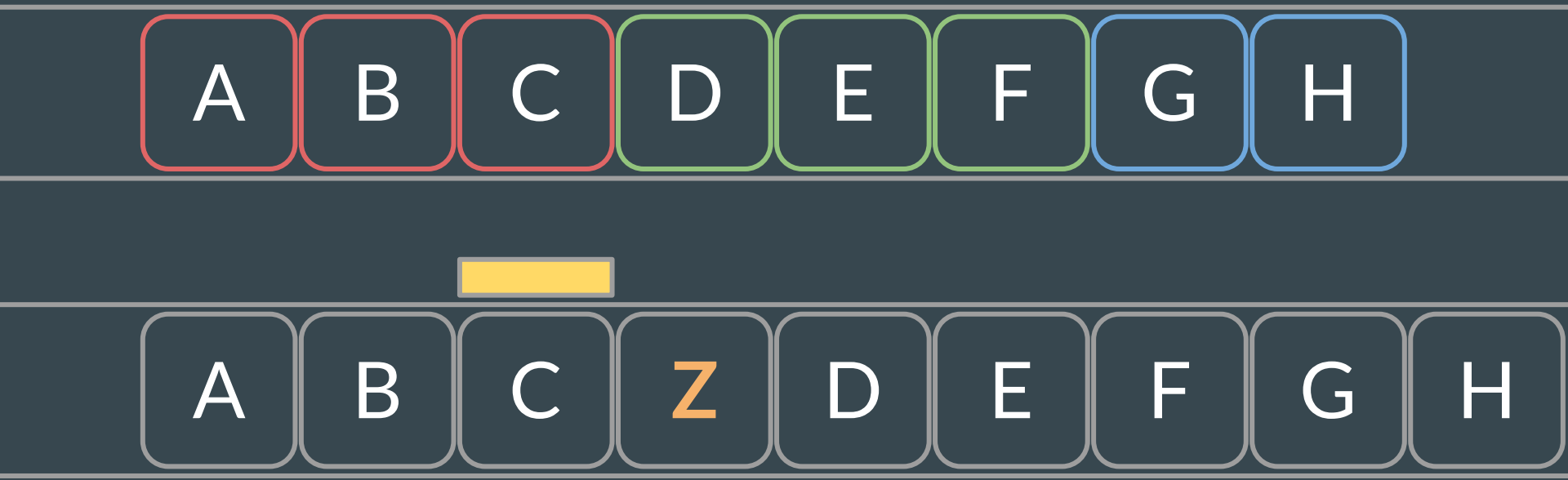
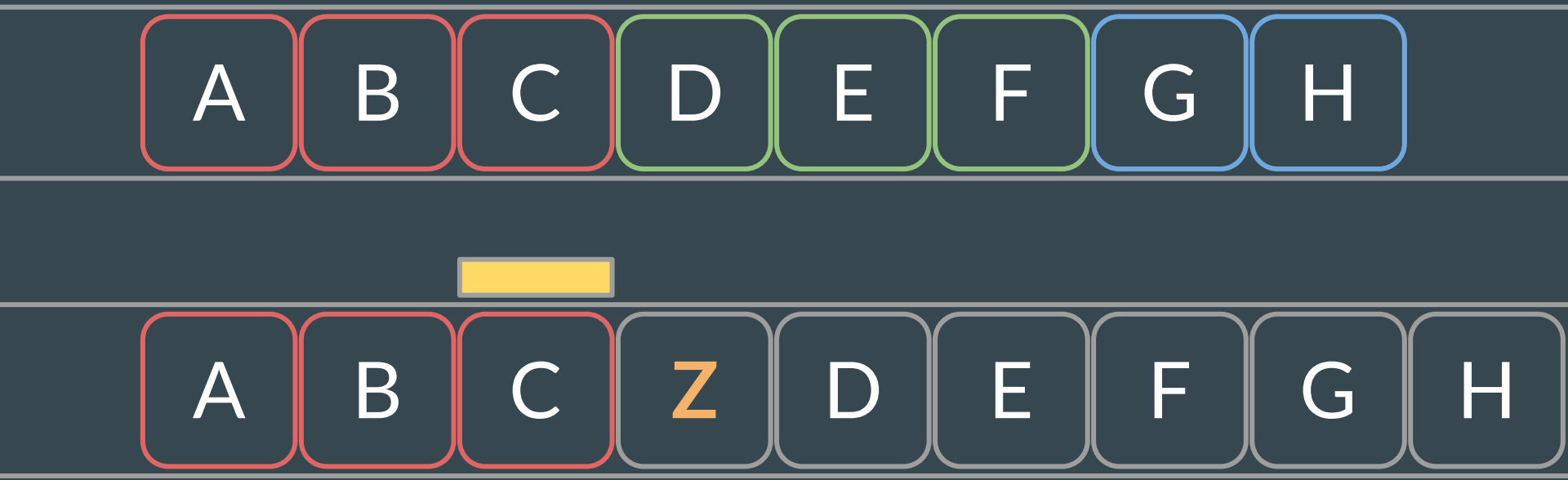


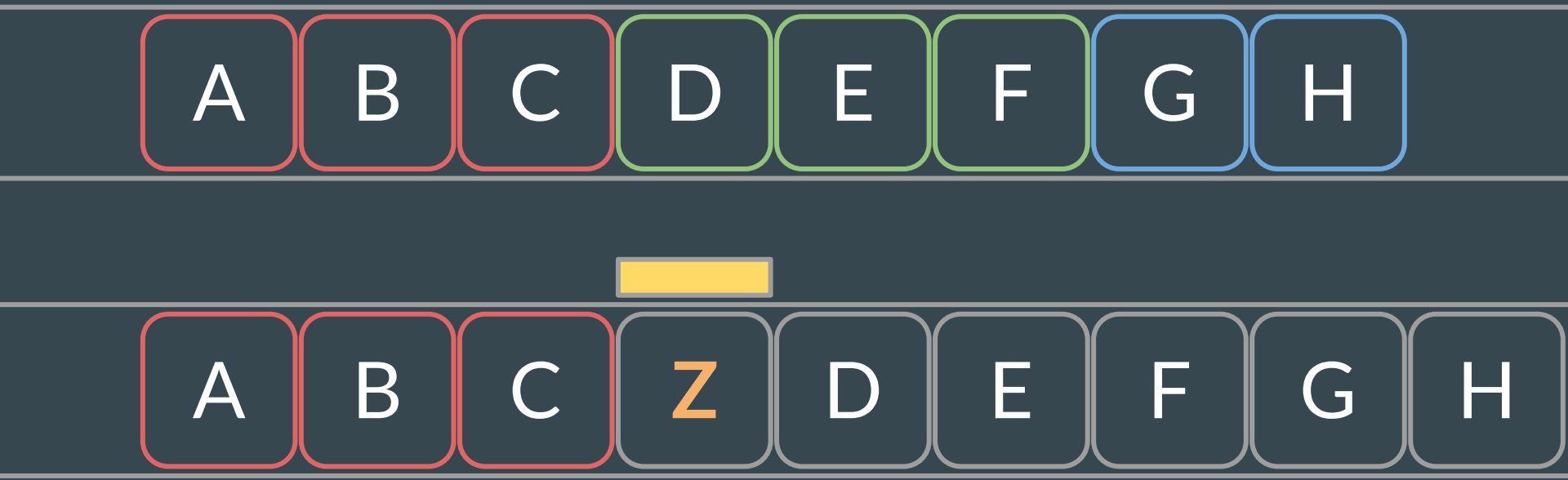
Byte Shift (again)



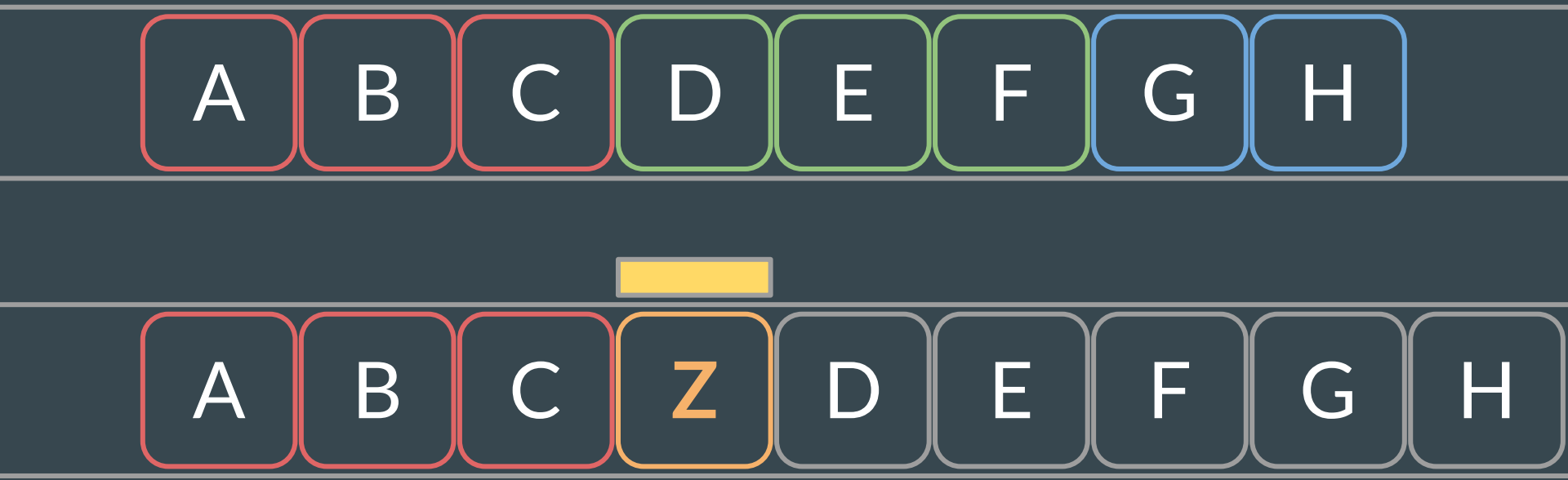
Byte Shift (again)



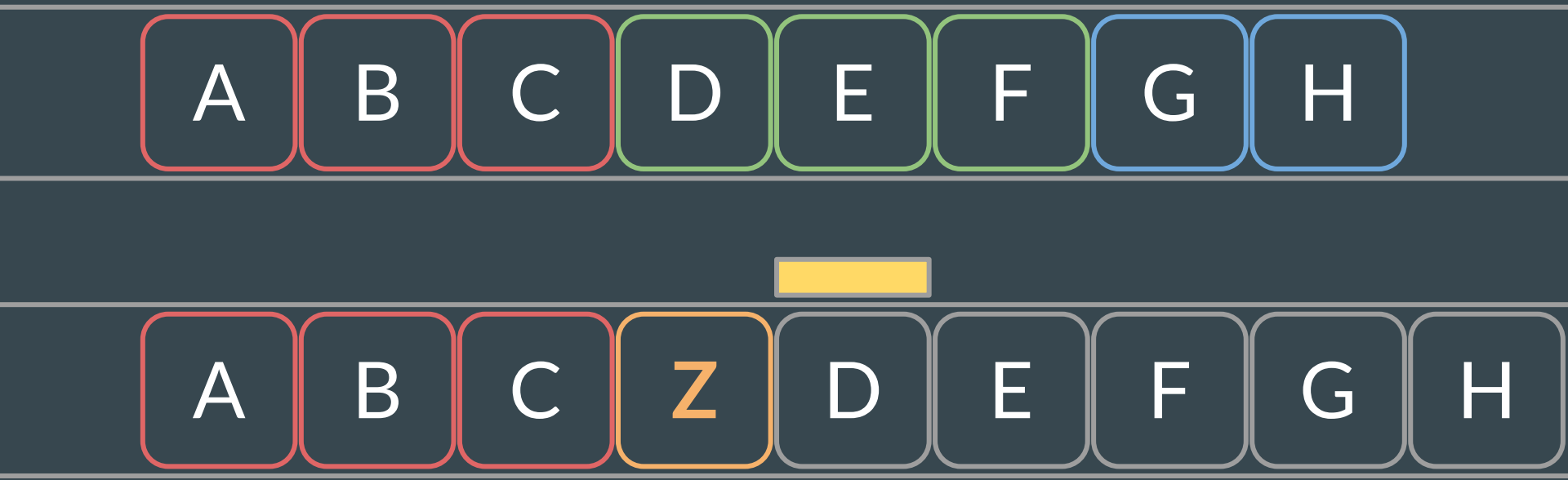
Byte Shift (worst case)



Byte Shift (worst case)



Byte Shift (worst case)



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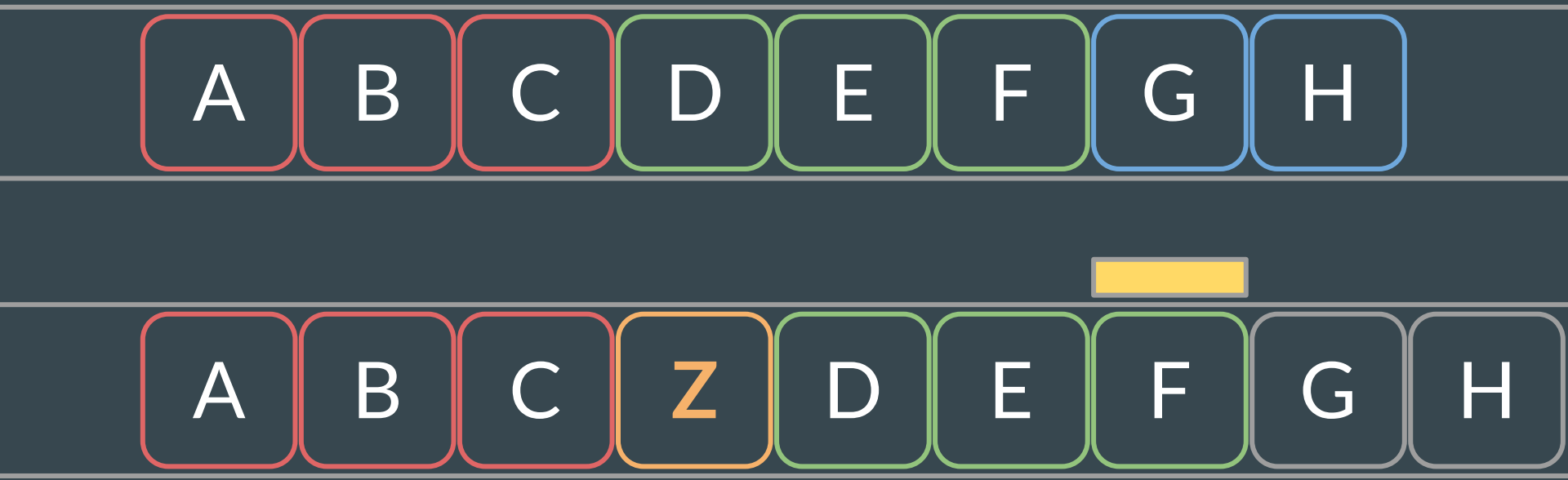

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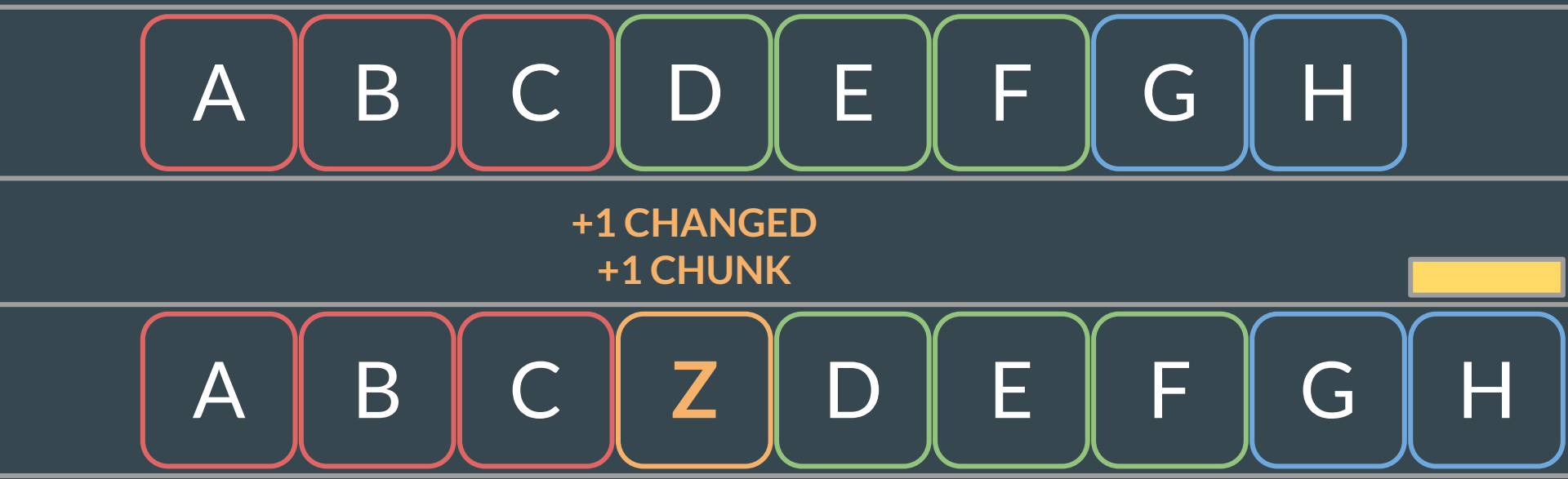

Profit !

~20% less chunks for same data

3-15% less data on the wire

Chunks are now **resistant** to Byte Shift

Thank you