Hot/Cold Data Identification

Suggestion

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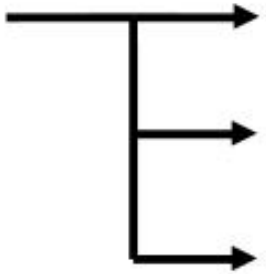
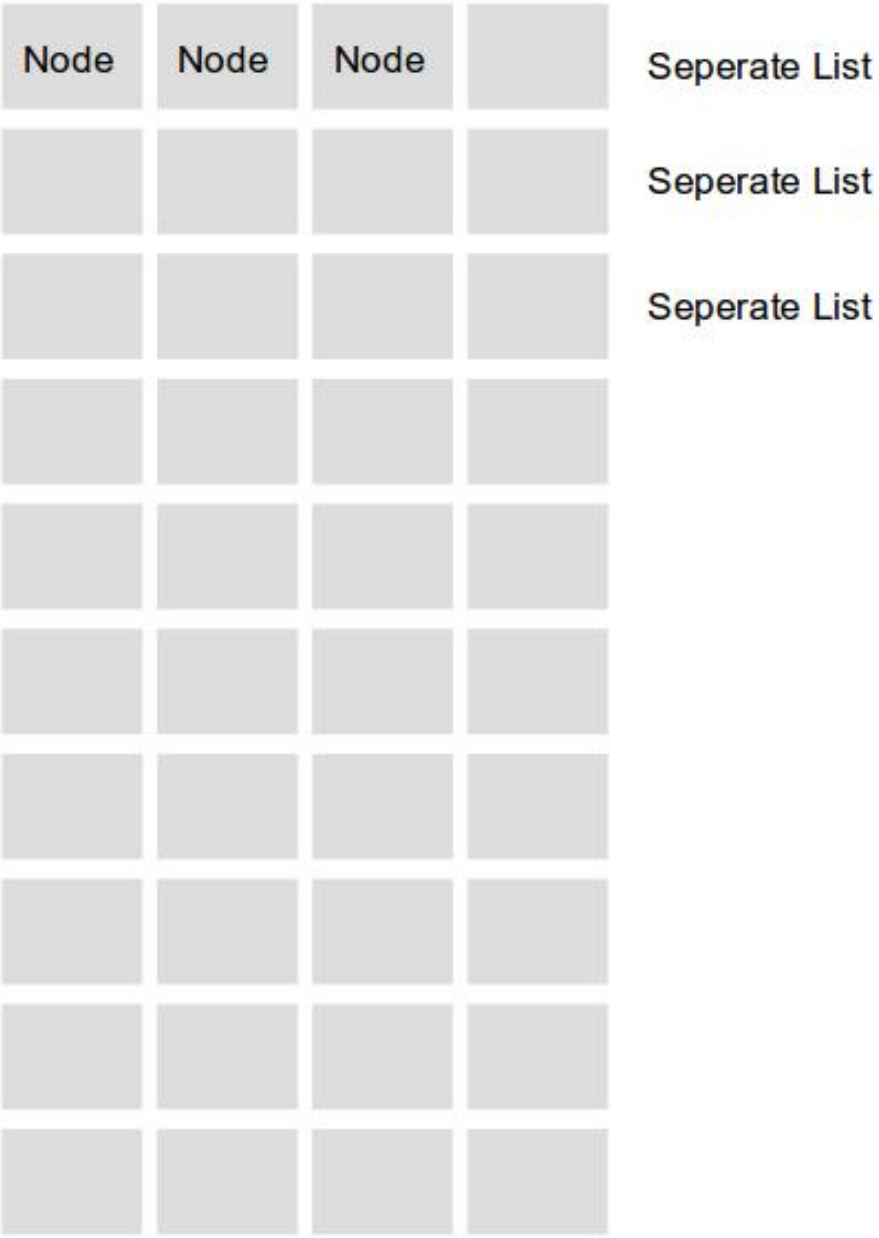
INDEX

- Data Structure
- Operations
- Frequency Identification
- Recency Identification
- Deploying ‘Stack Distance’

Data Structure

Double Linked List

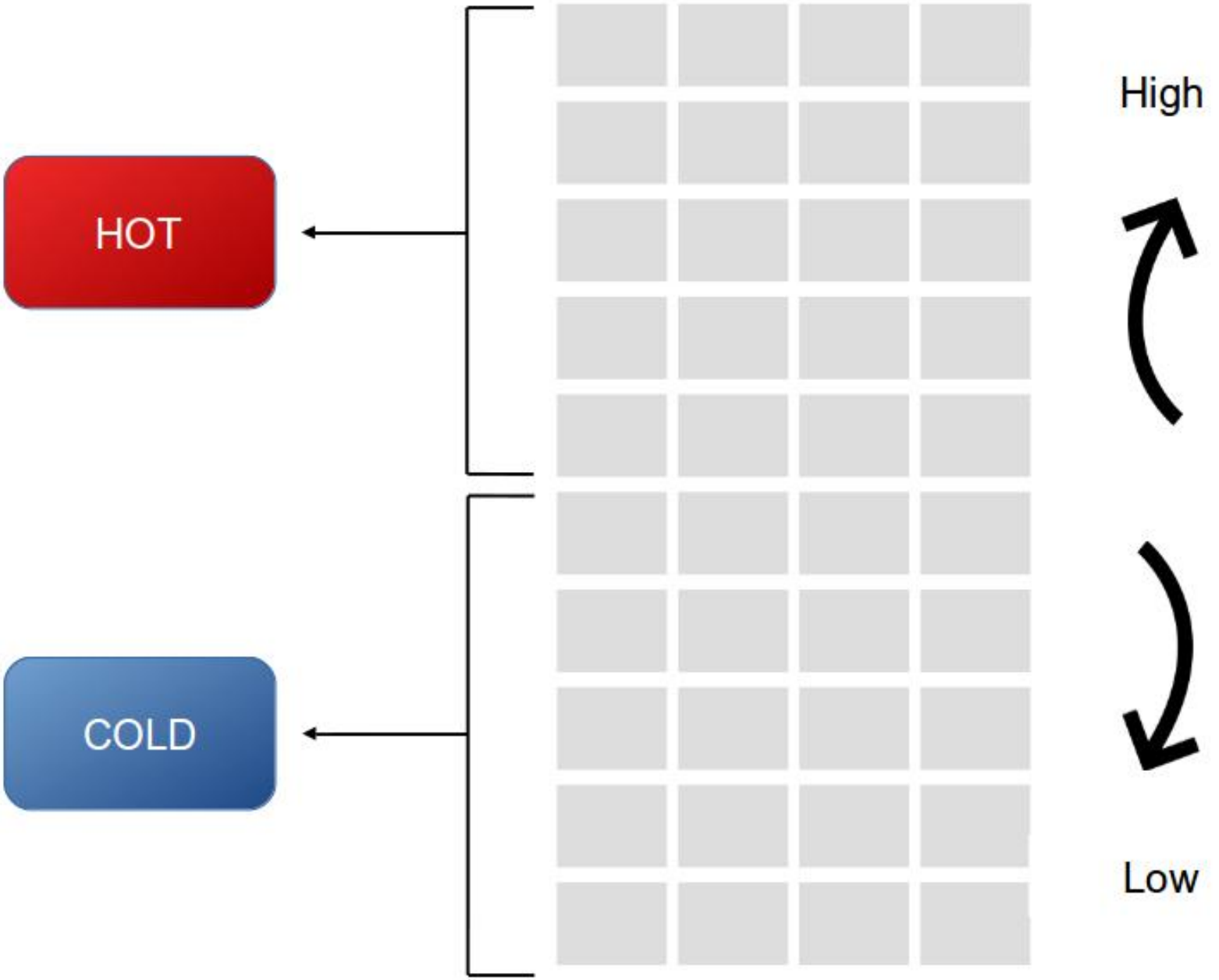




* Each List is
seperate from lists above and below

* Each List has
limit for maximum size

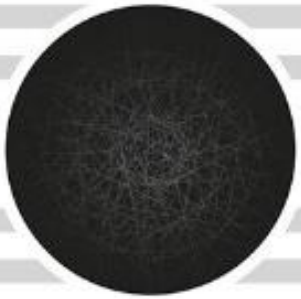
Data Structure



Data Structure

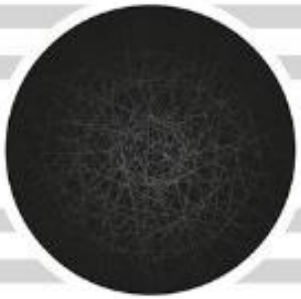
NODE

- int jump : how many levels this jumped previously
- address_t* blk_address : pointer to the block
  or a hash value of the block with smaller digits than address itself
- etc.

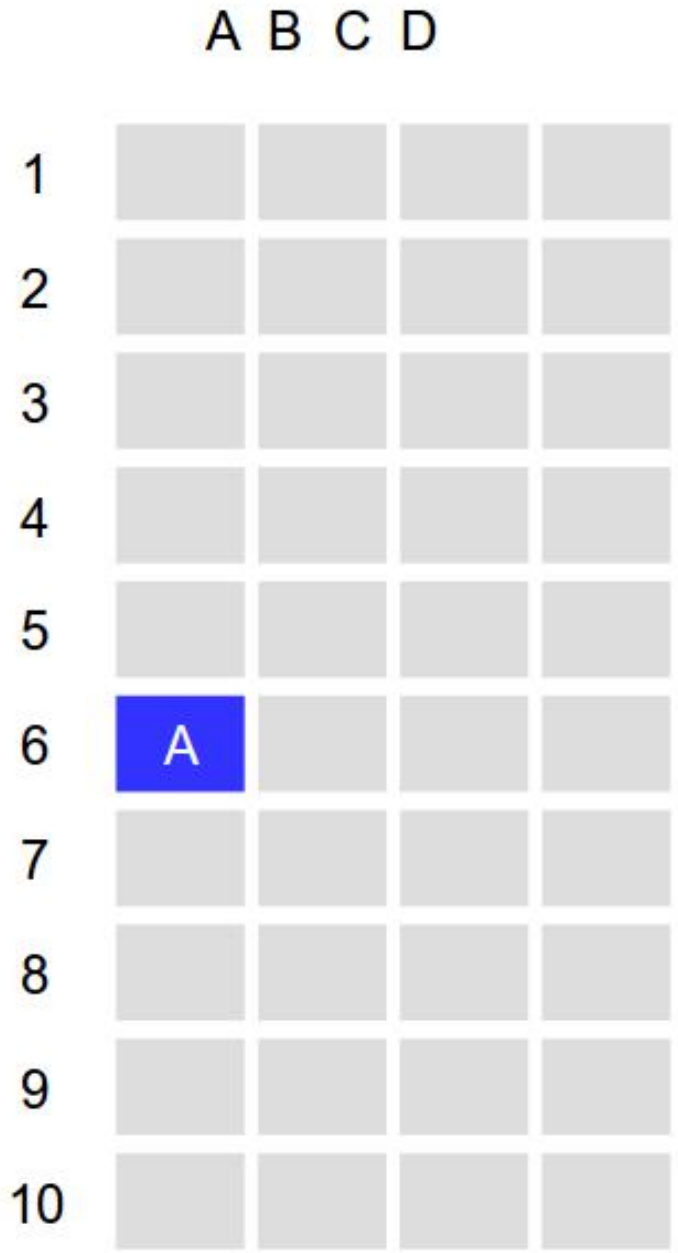


Operations

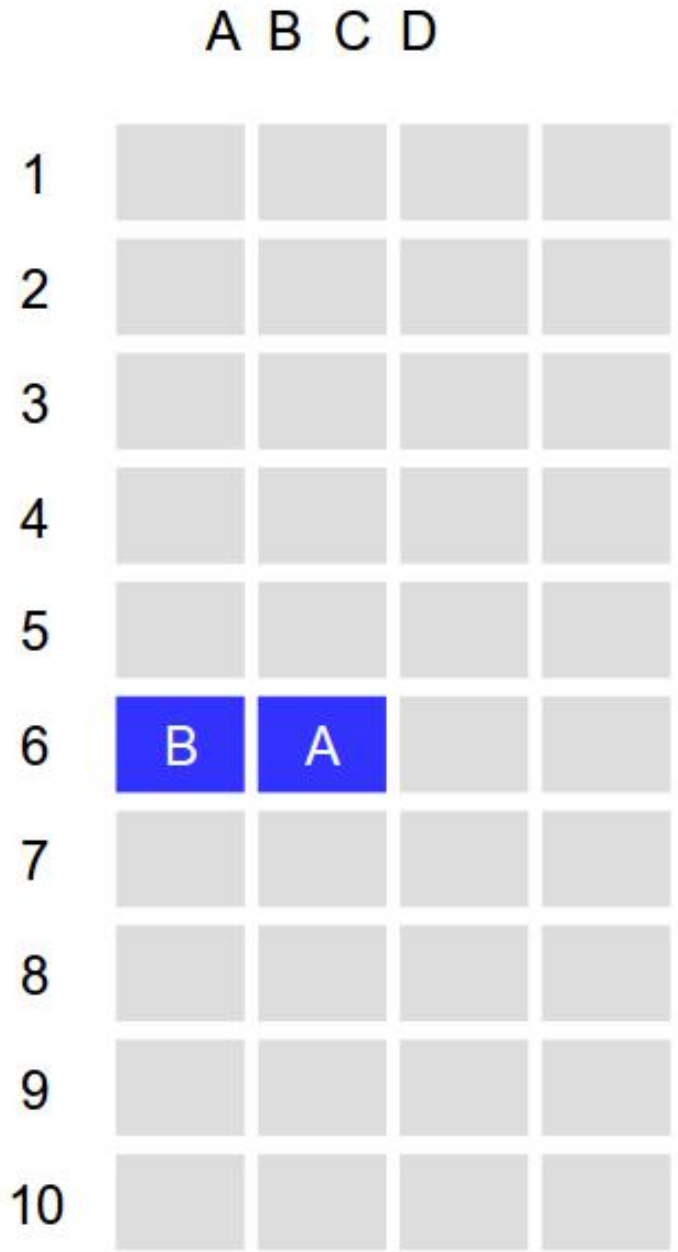
- Insert
- Remove
- Jump
  - Heat (special case of jump operation)
- Push
  - Down (special case of push operation)



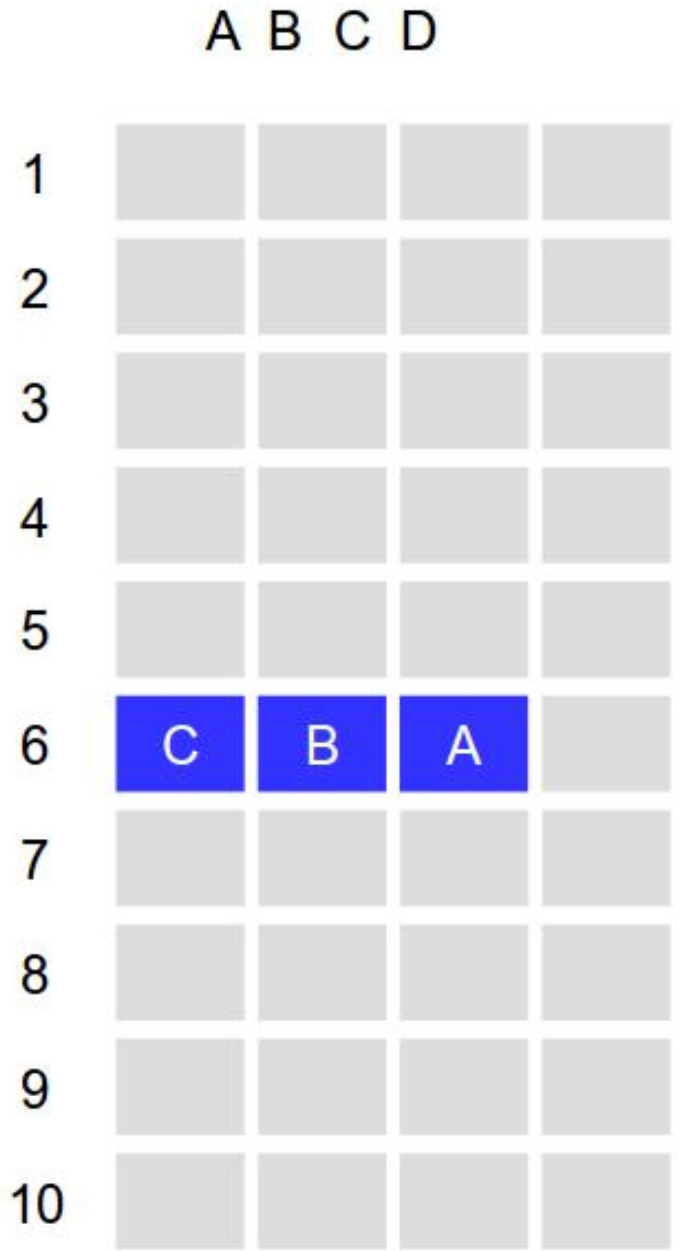
Operations – 1) Insert



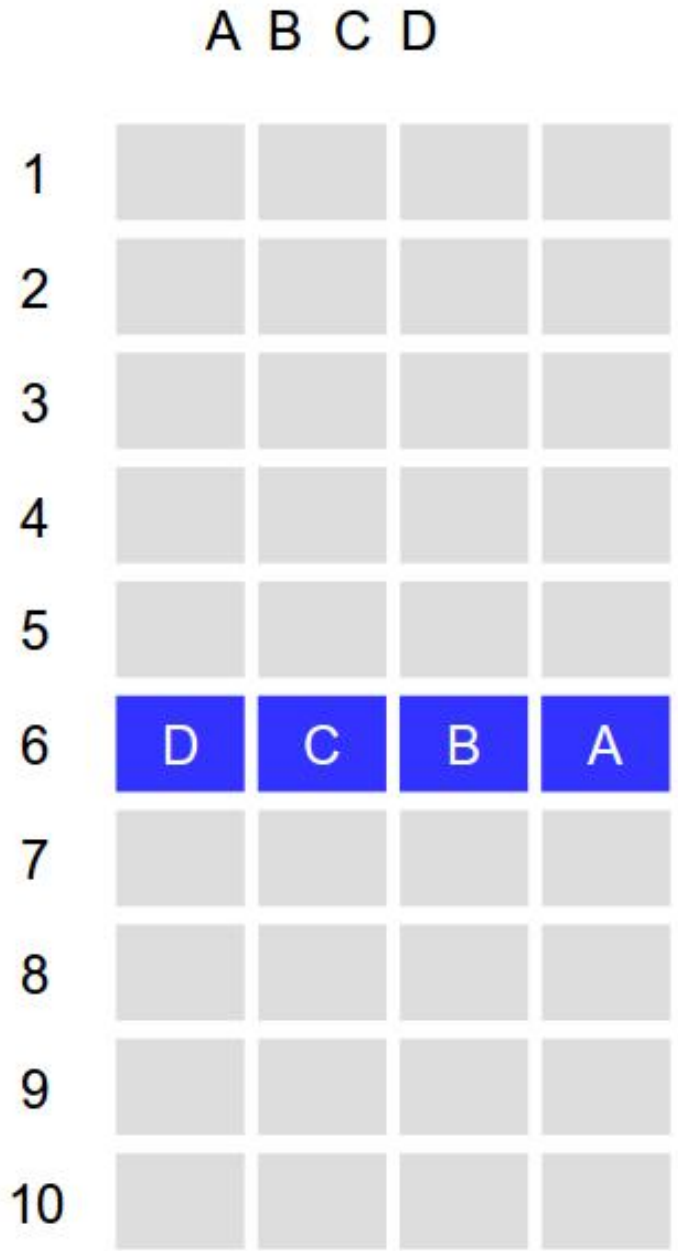
Operations – 1) Insert



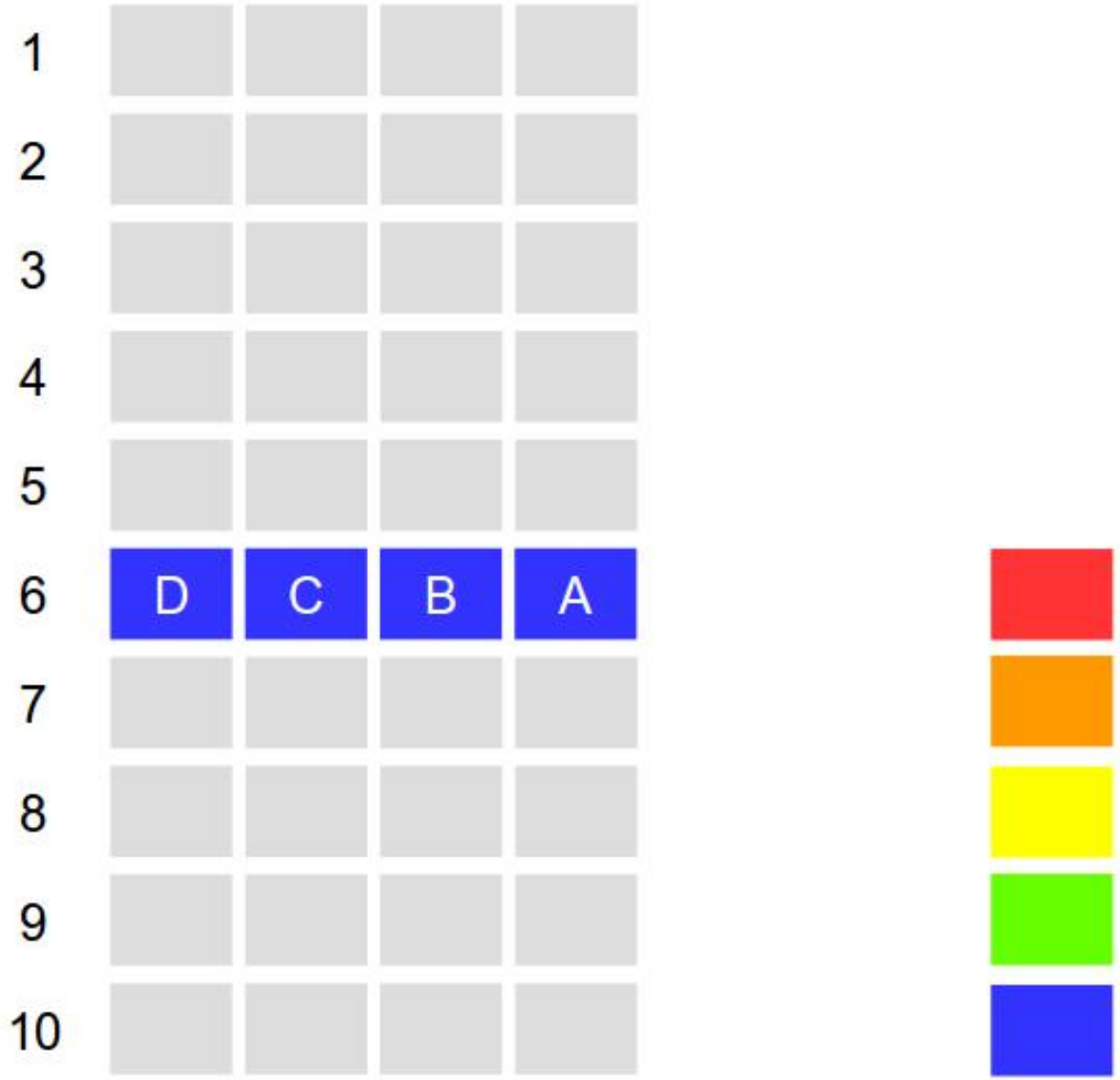
Operations – 1) Insert



Operations – 1) Insert

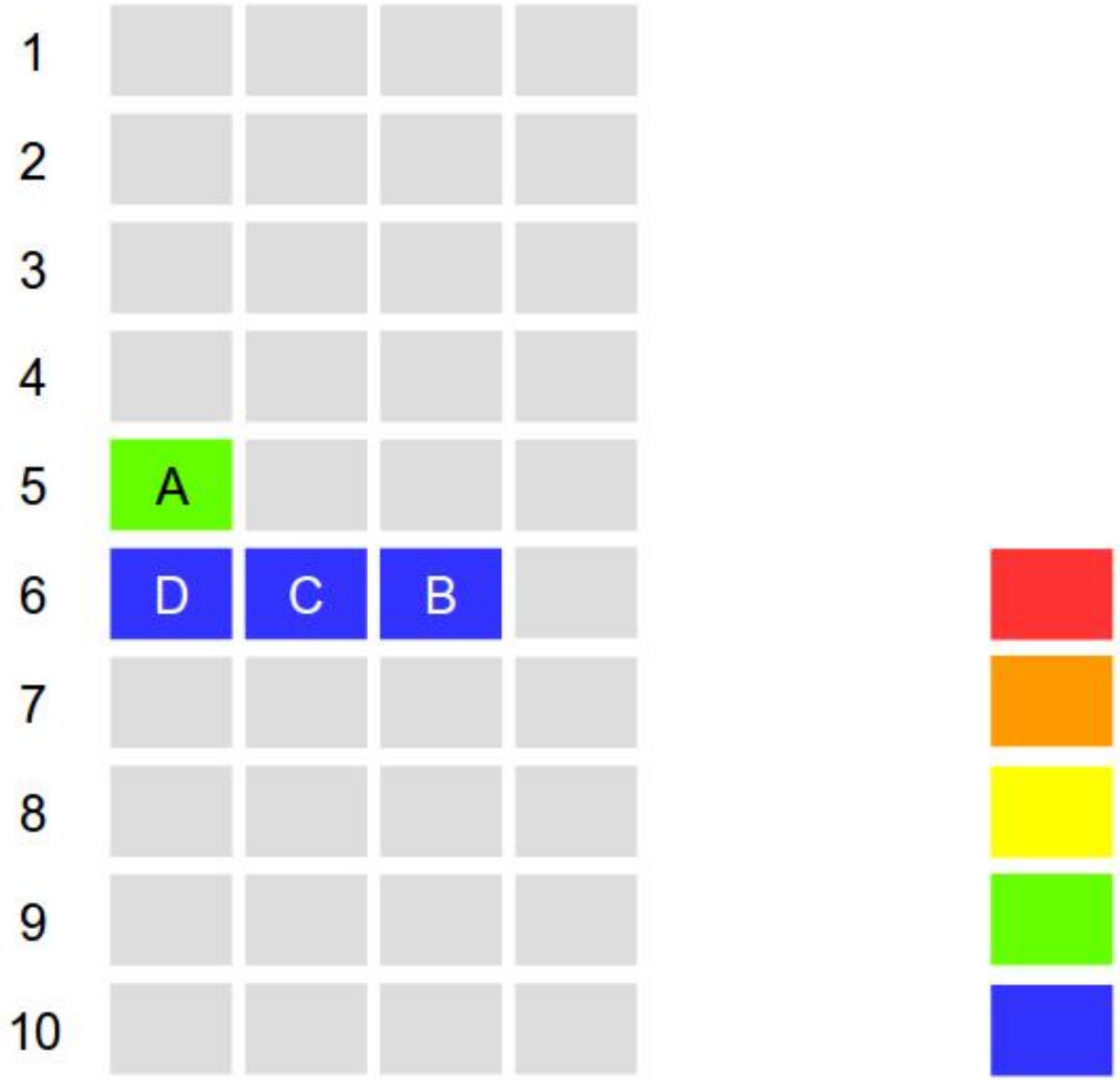


Operations – 3) Jump



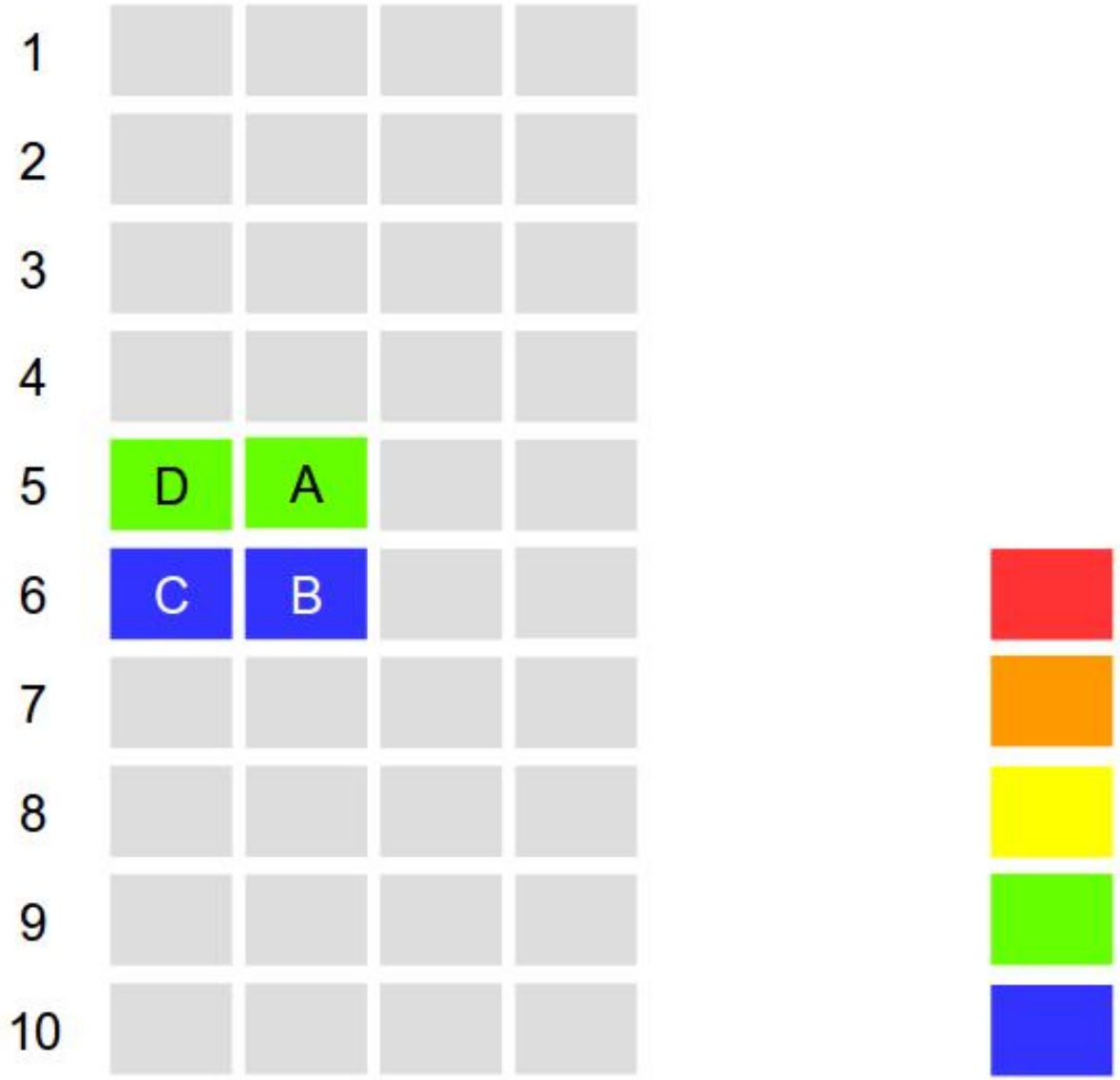
Operations – 3) Jump

A D D B A D



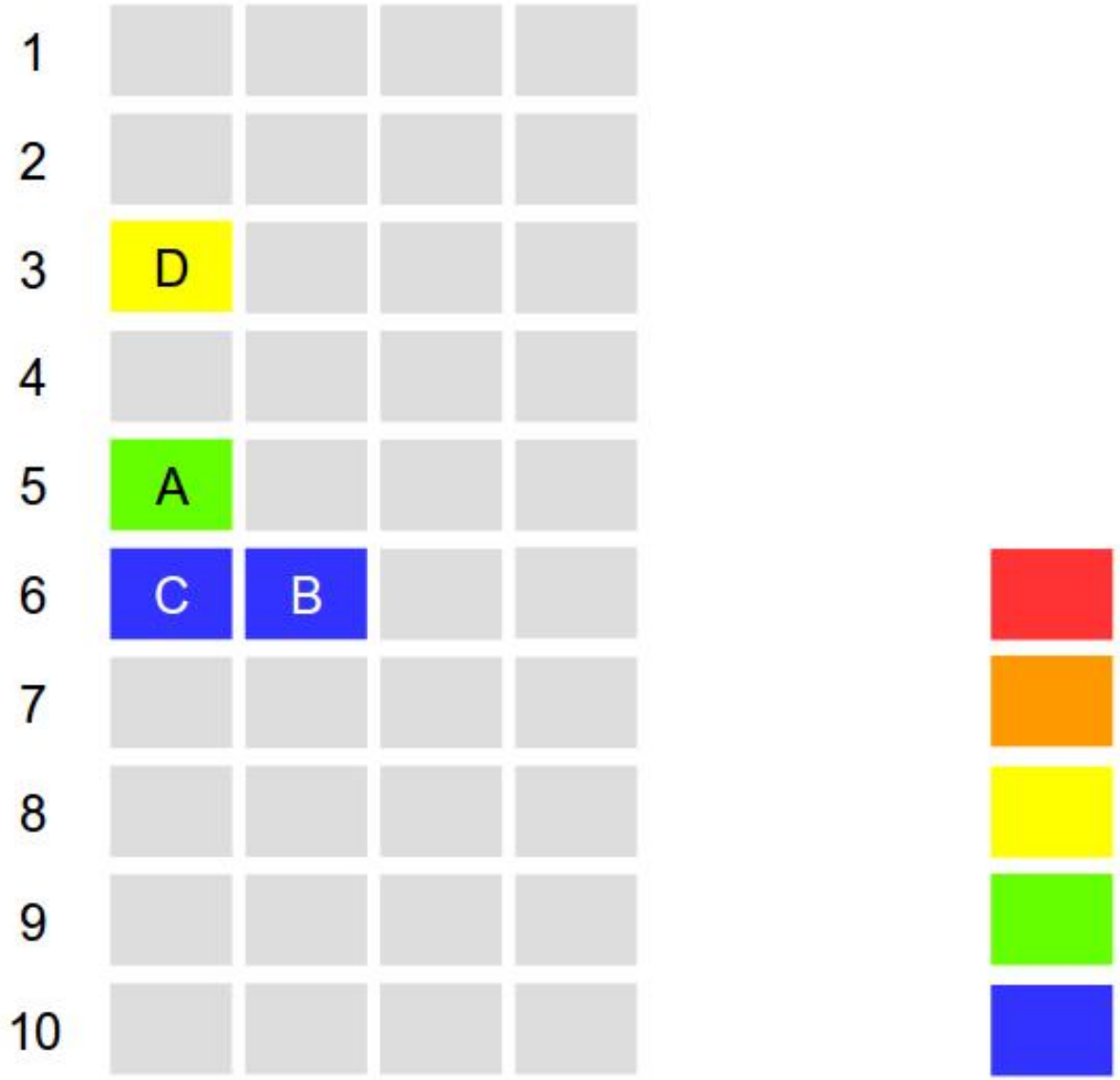
Operations – 3) Jump

A **D** D B A D

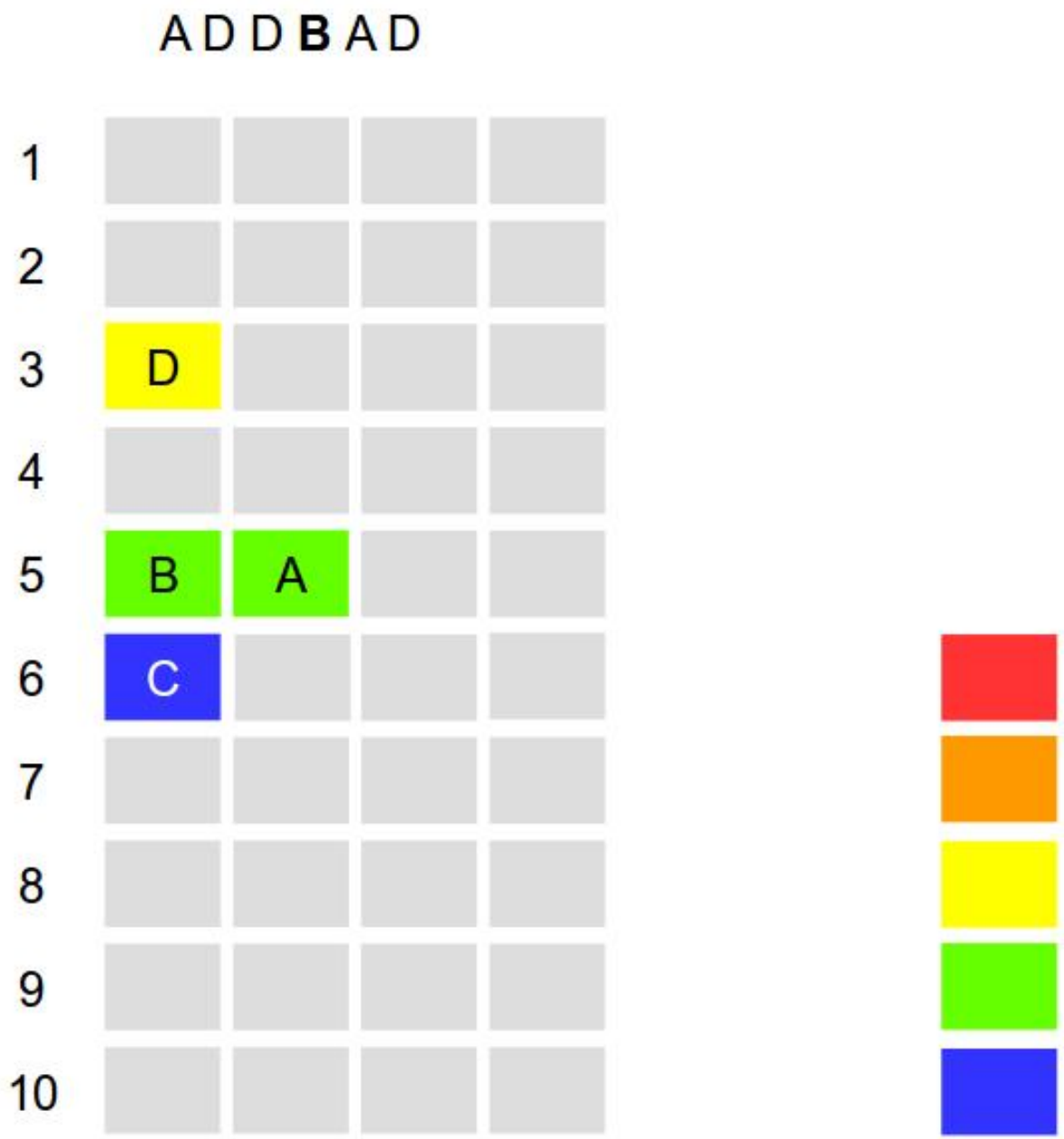


Operations – 3) Jump

A D **D** B A D

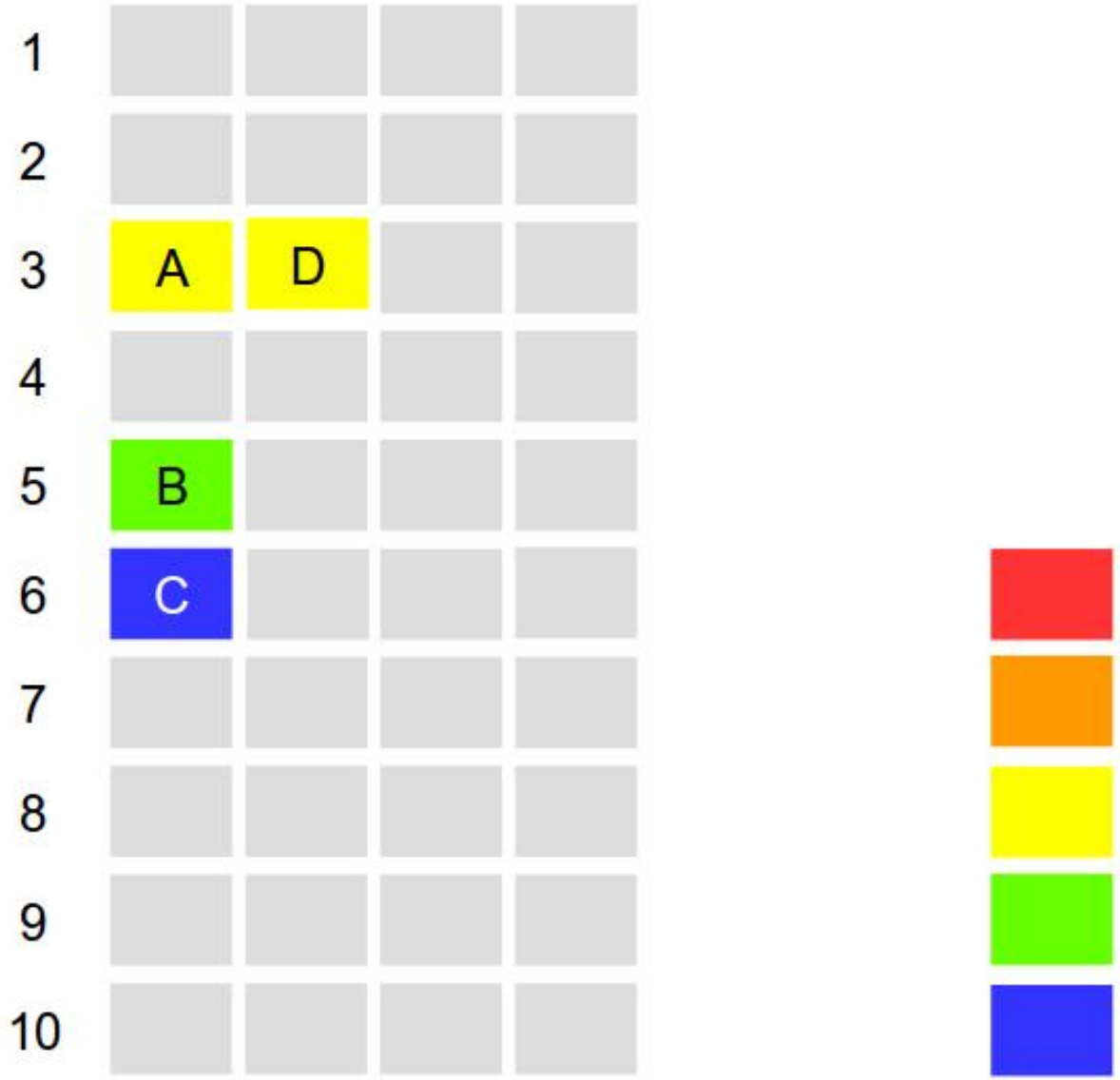


Operations – 3) Jump



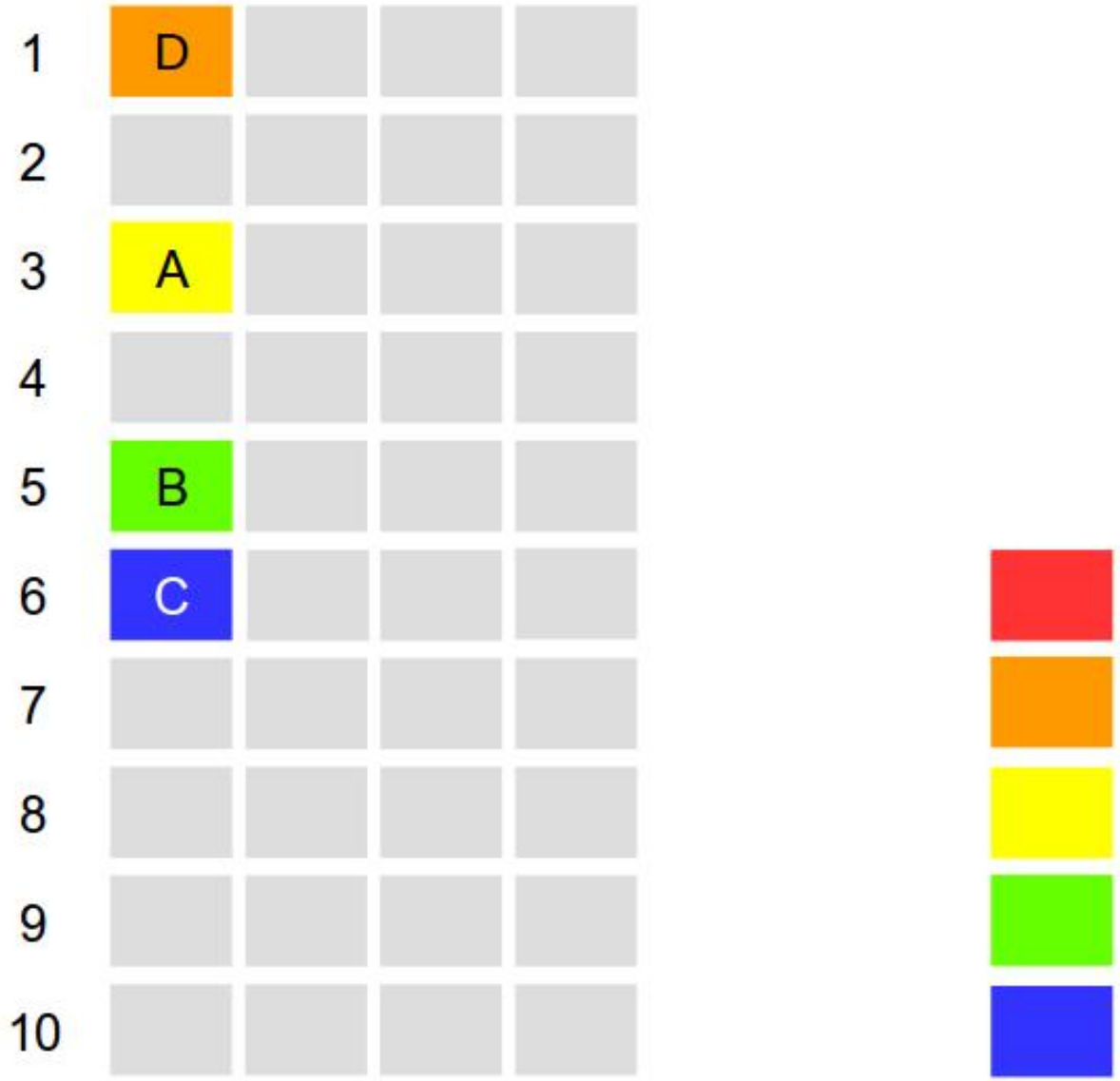
Operations – 3) Jump

A D D B **A** D

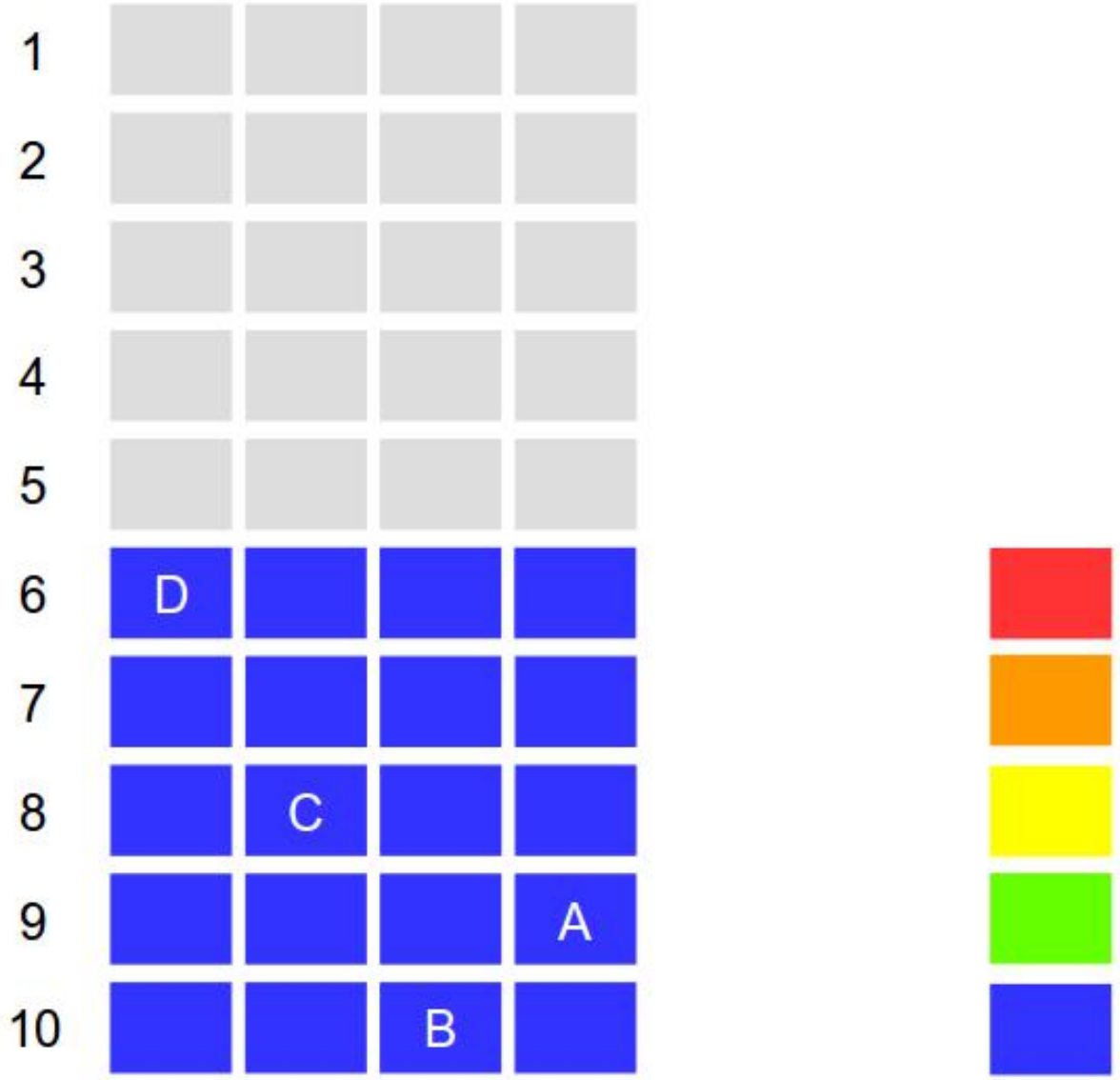


Operations – 3) Jump

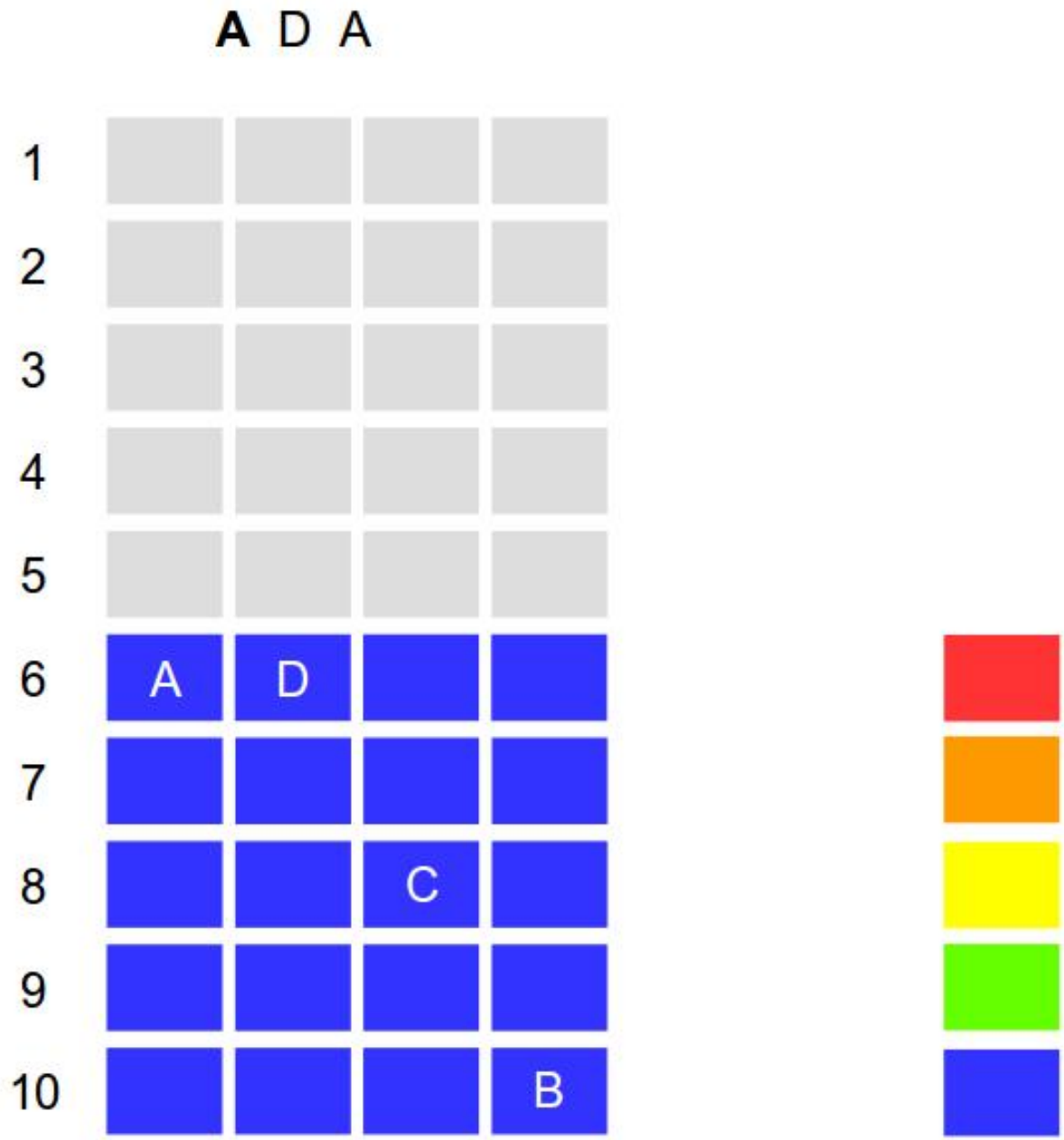
A D D B A **D**



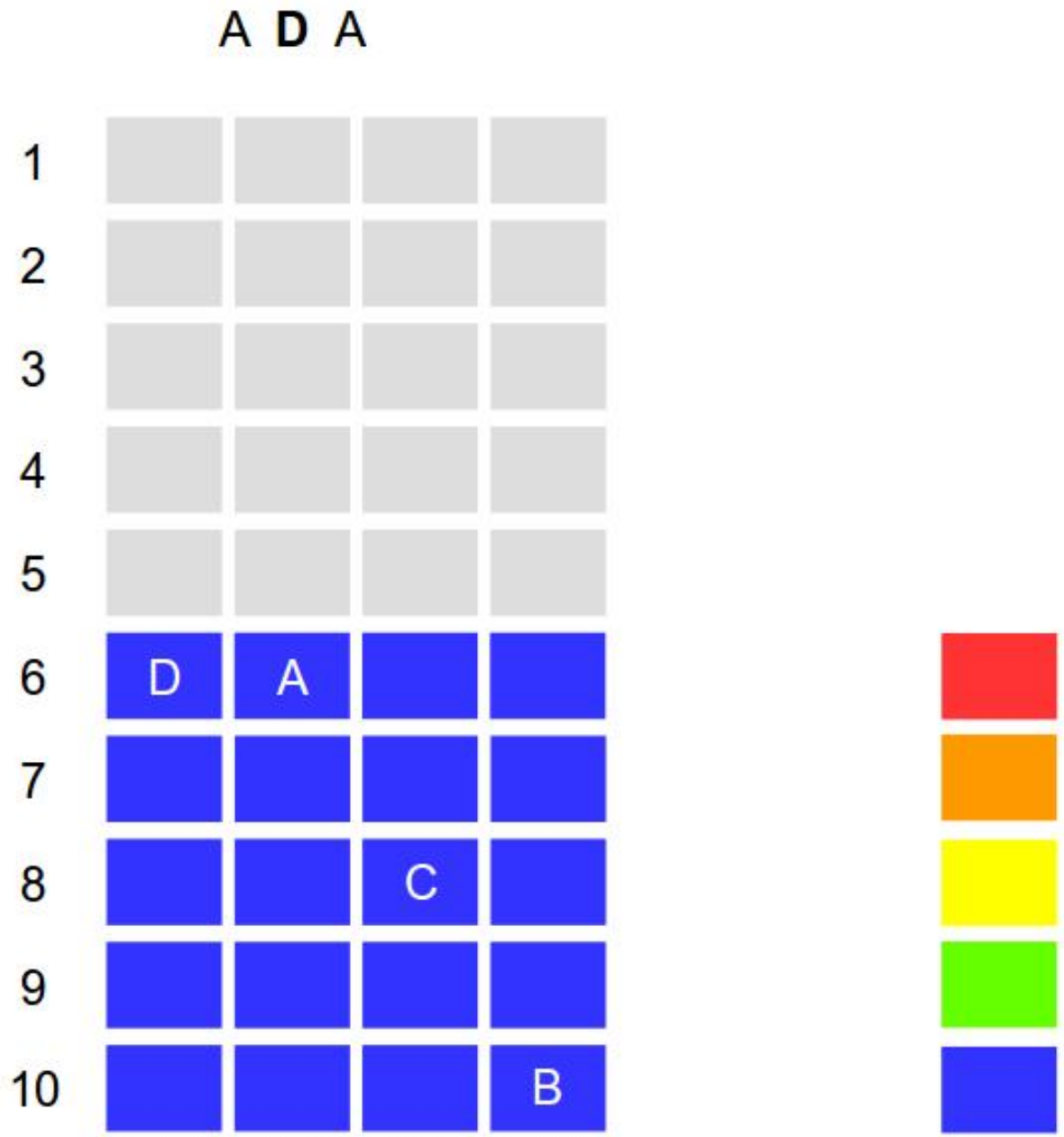
Operations – 3-1) Heat



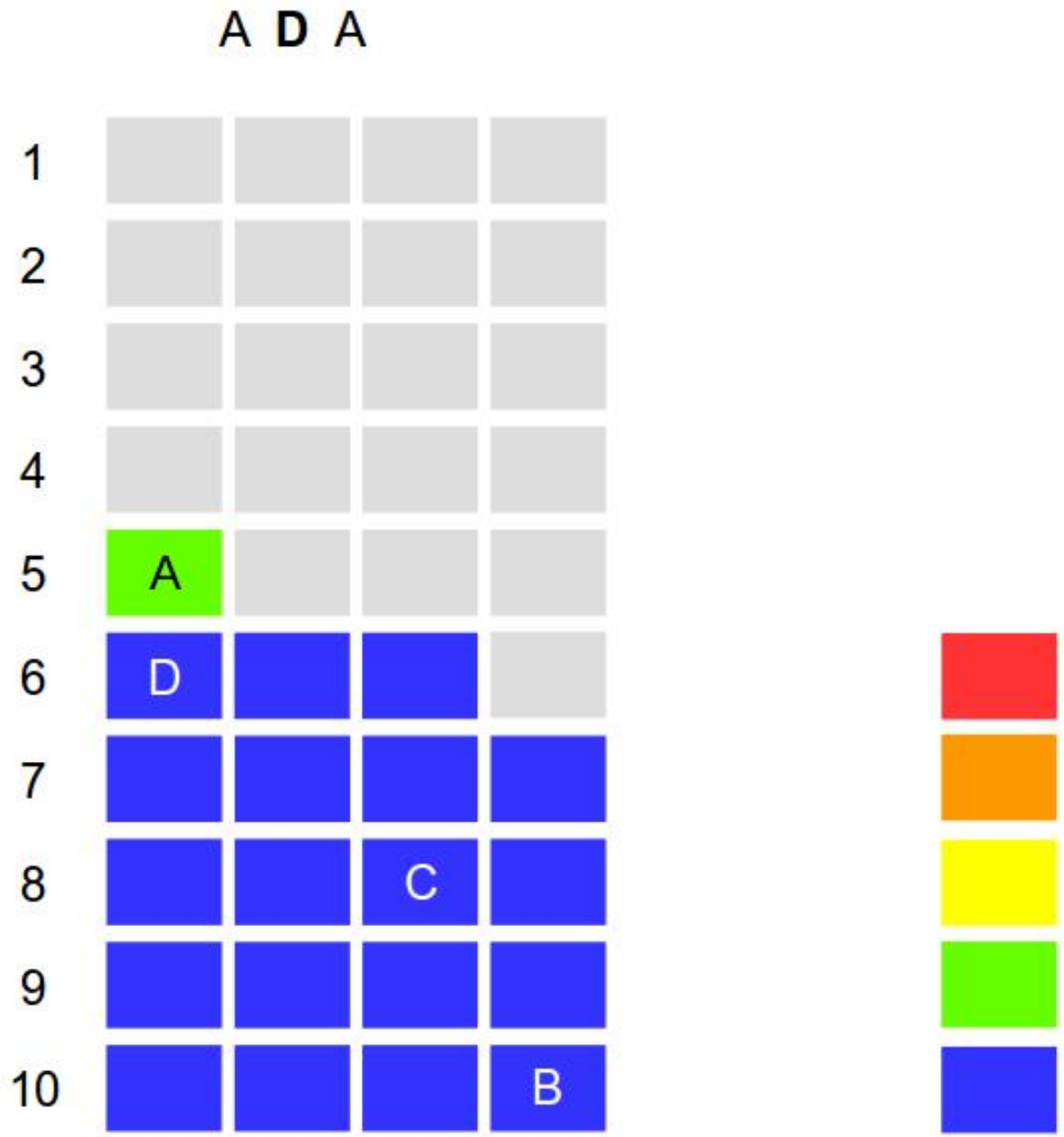
Operations – 3-1) Heat



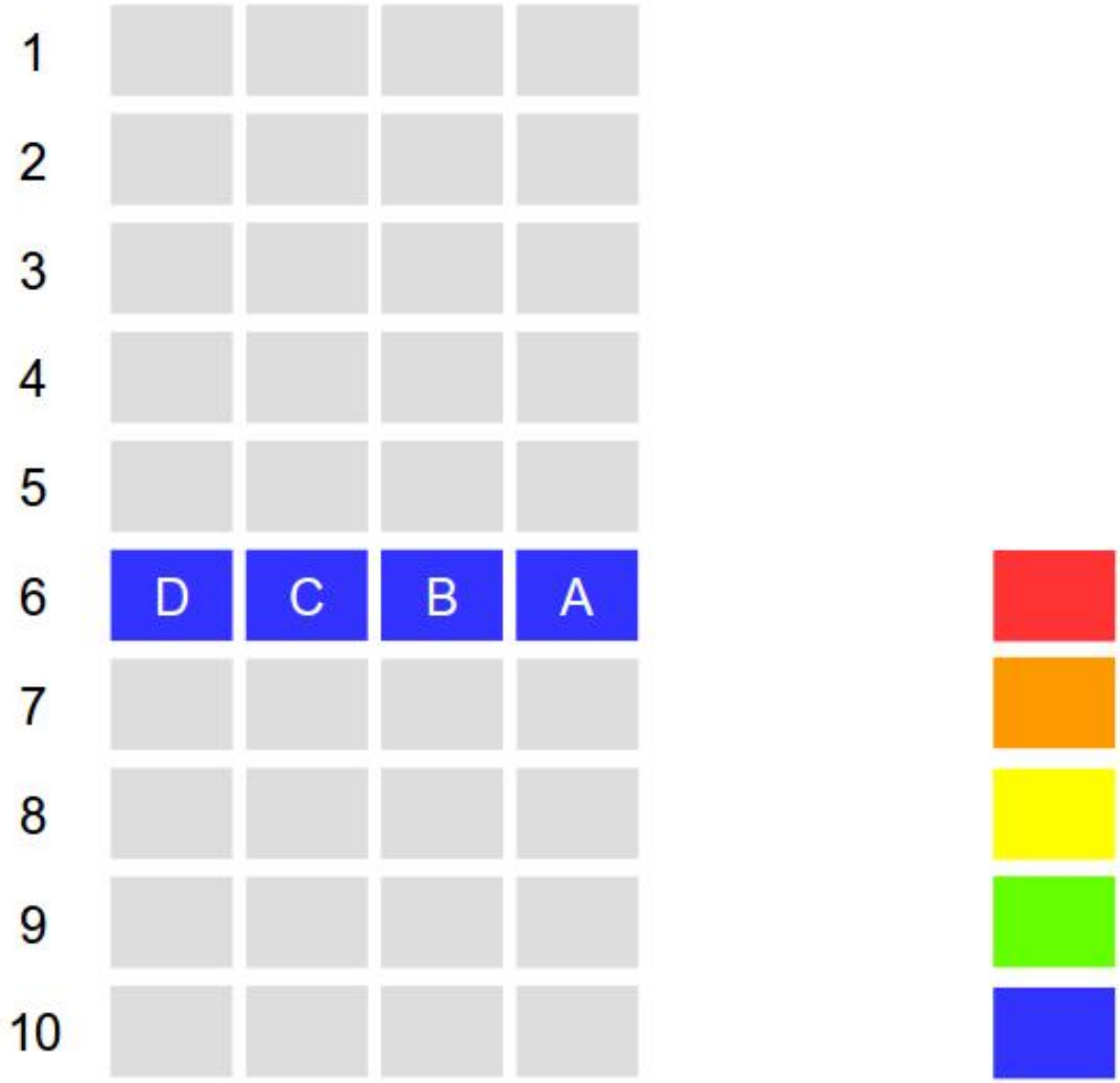
Operations – 3-1) Heat



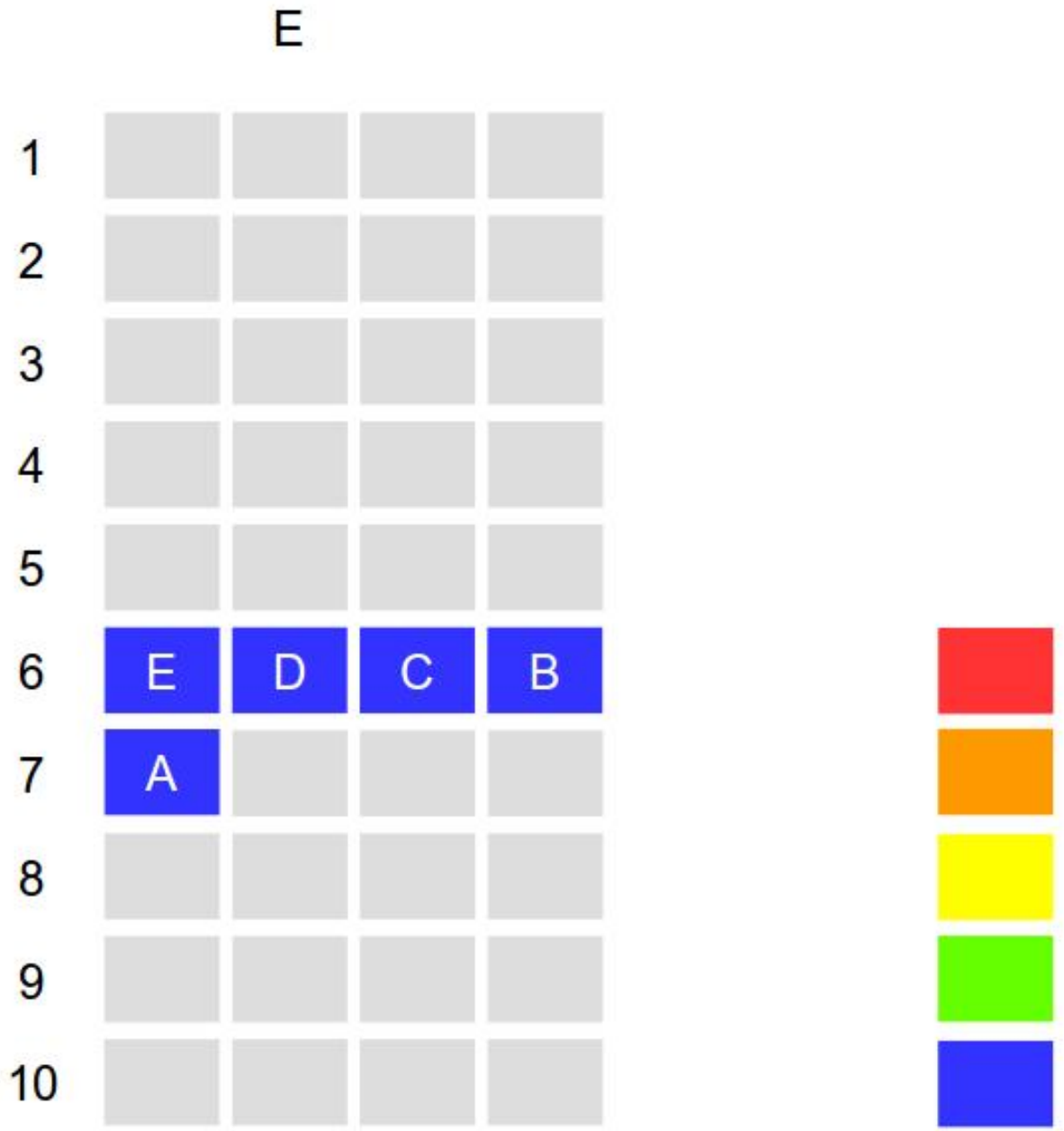
Operations – 3-1) Heat



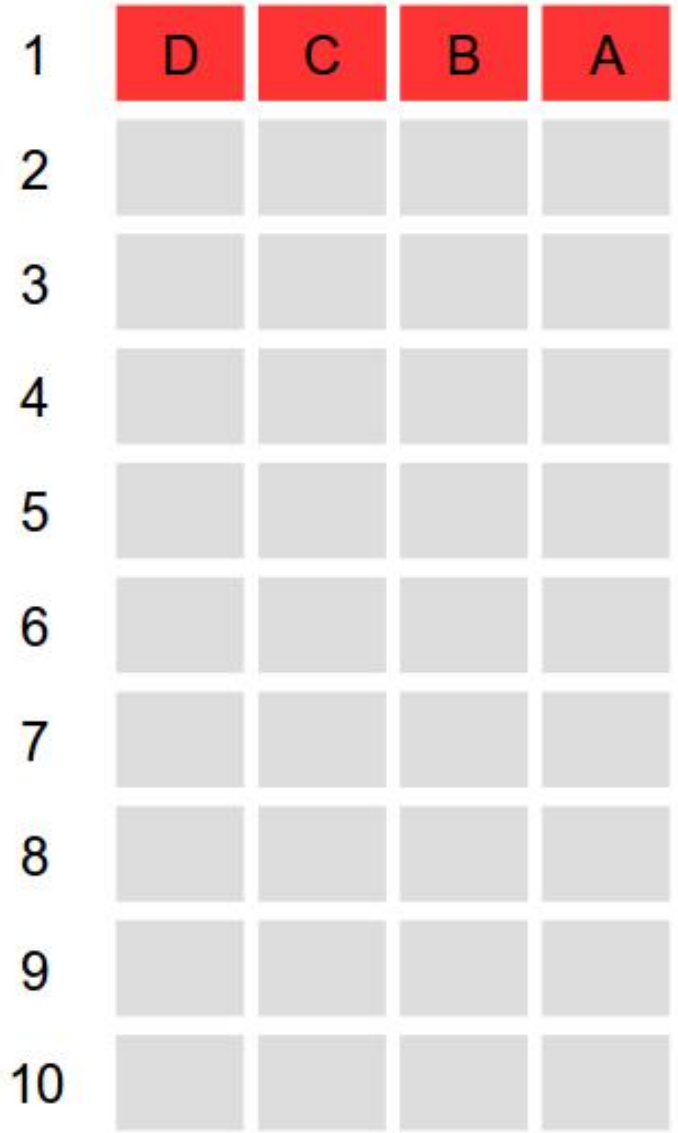
Operations – 4) Push



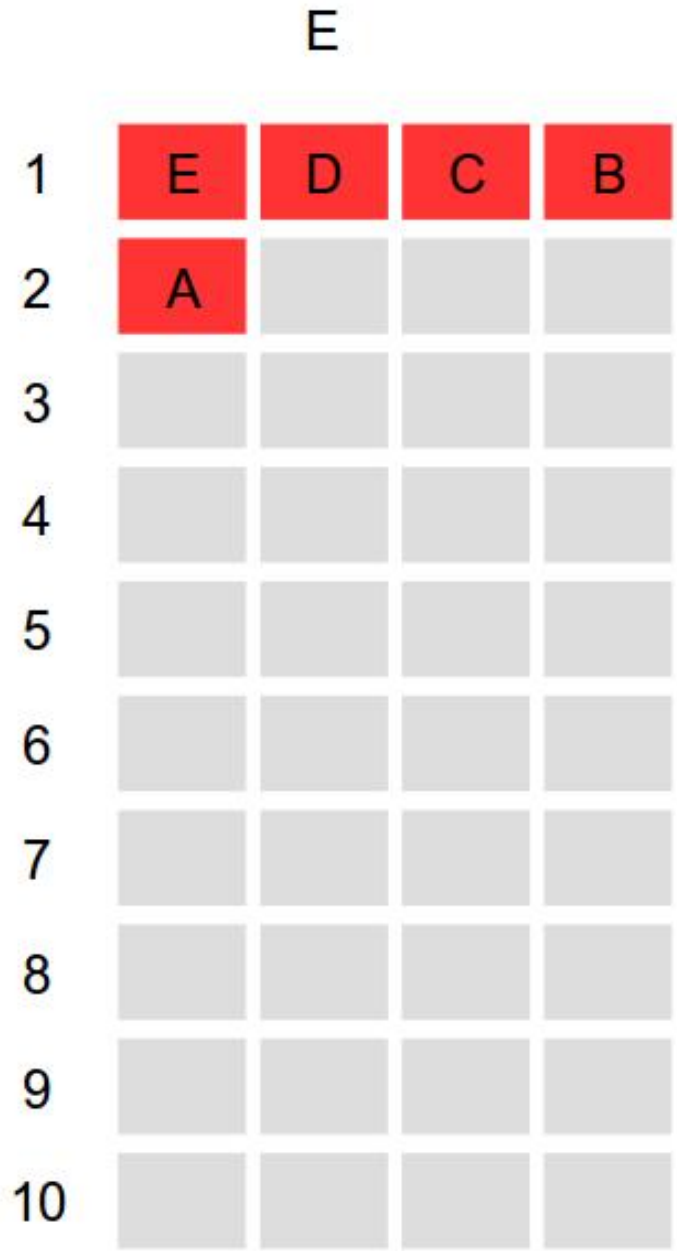
Operations – 4) Push



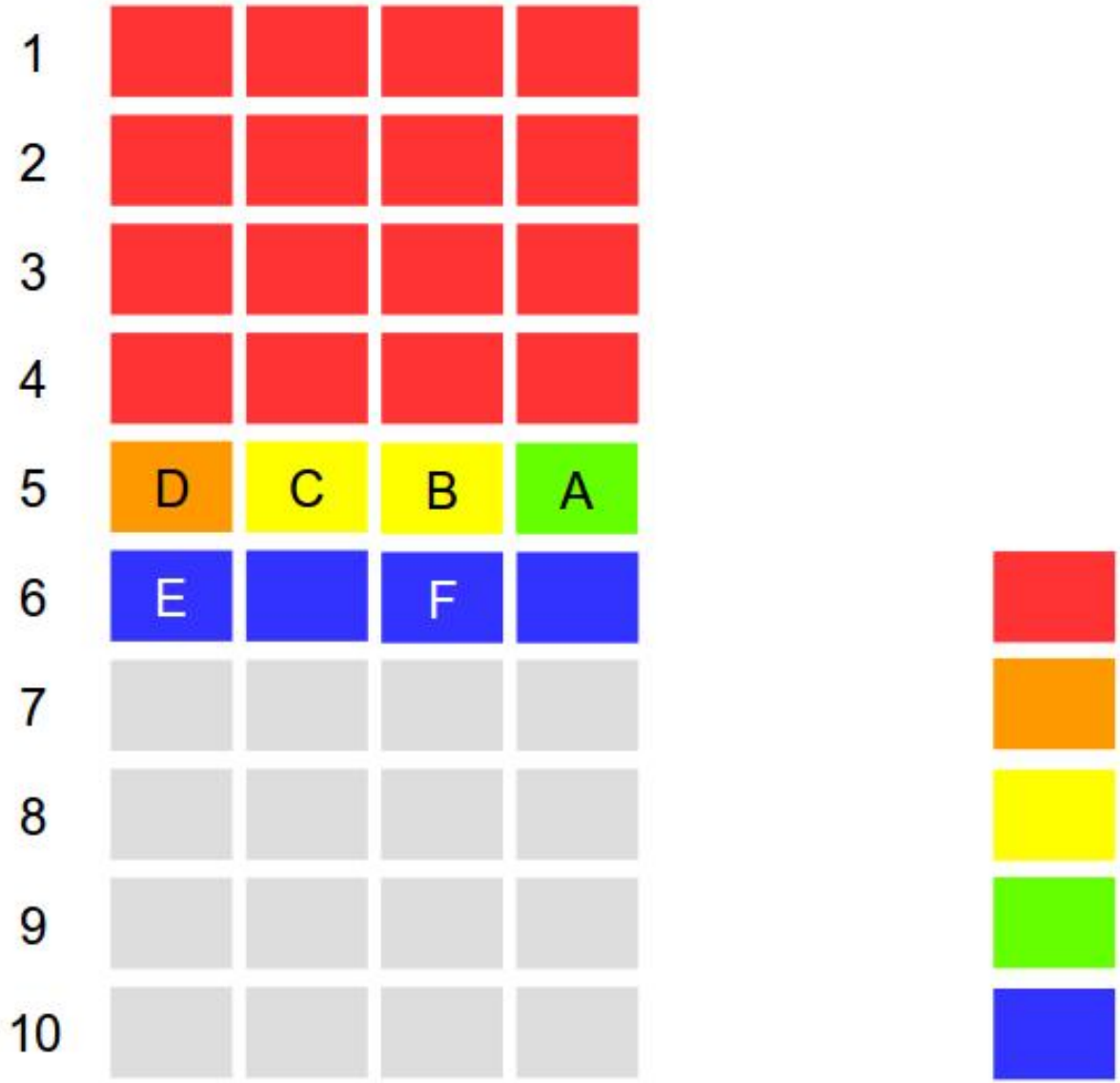
Operations – 4) Push



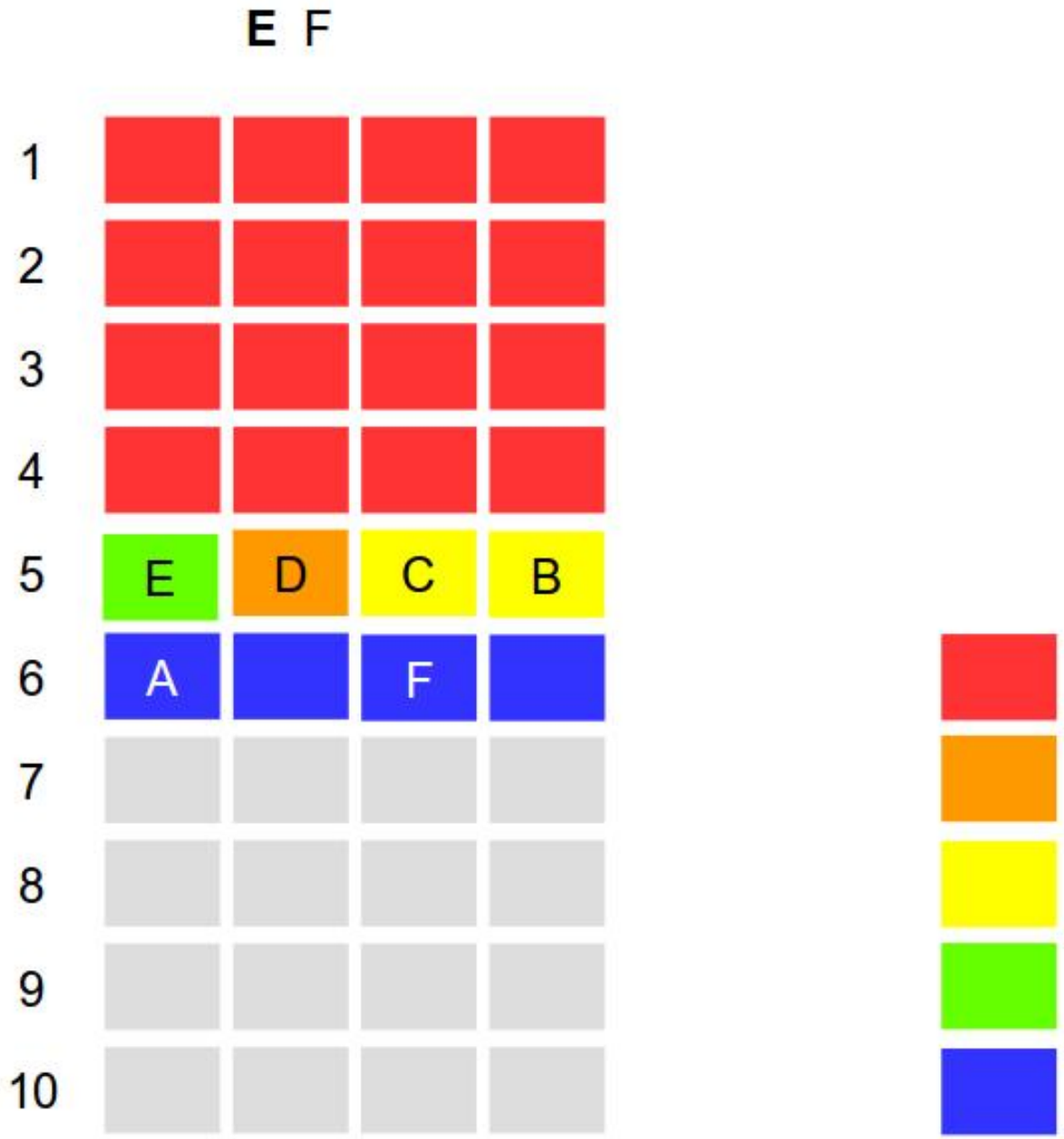
Operations – 4) Push



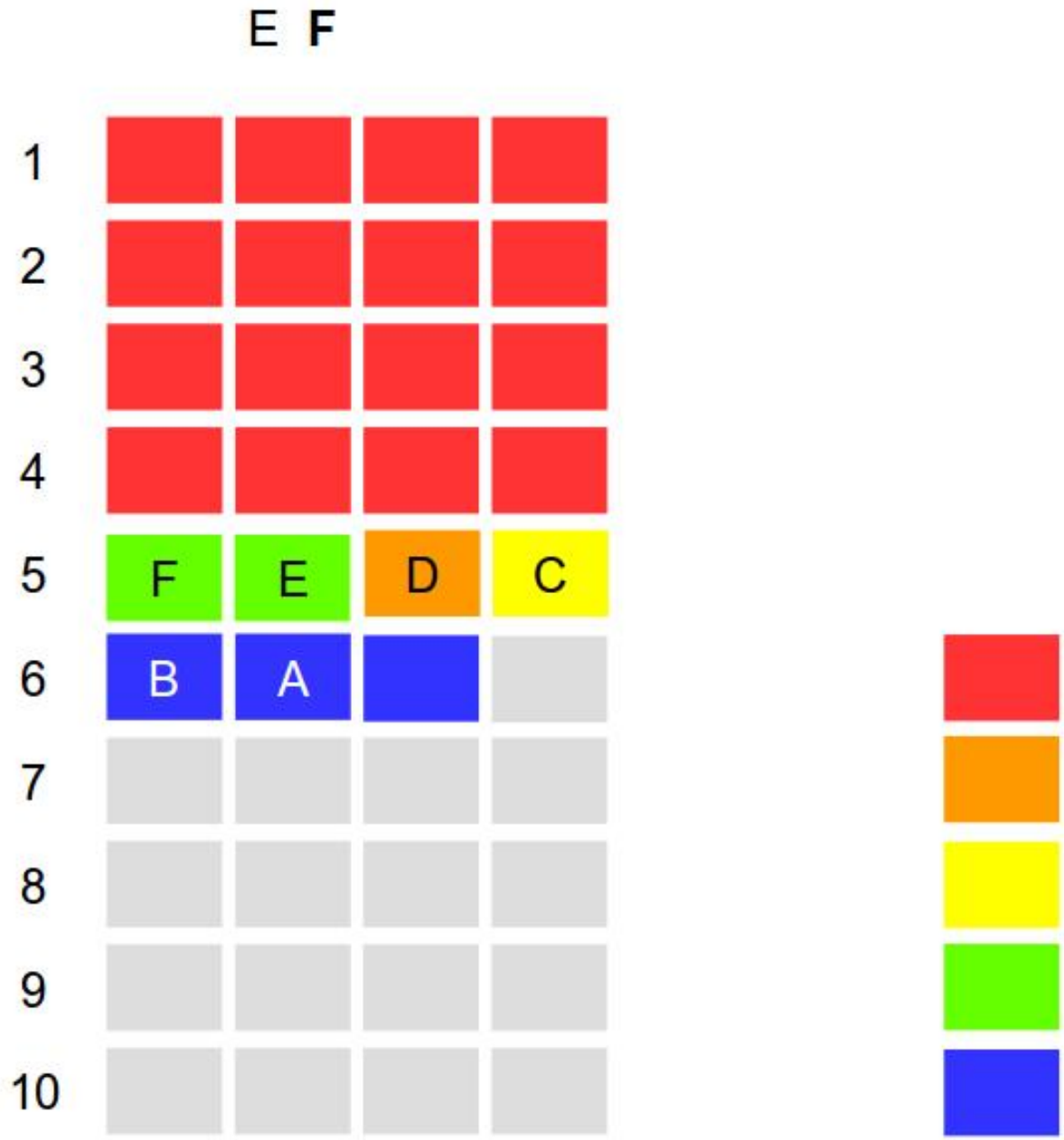
Operations – 4-1) Down



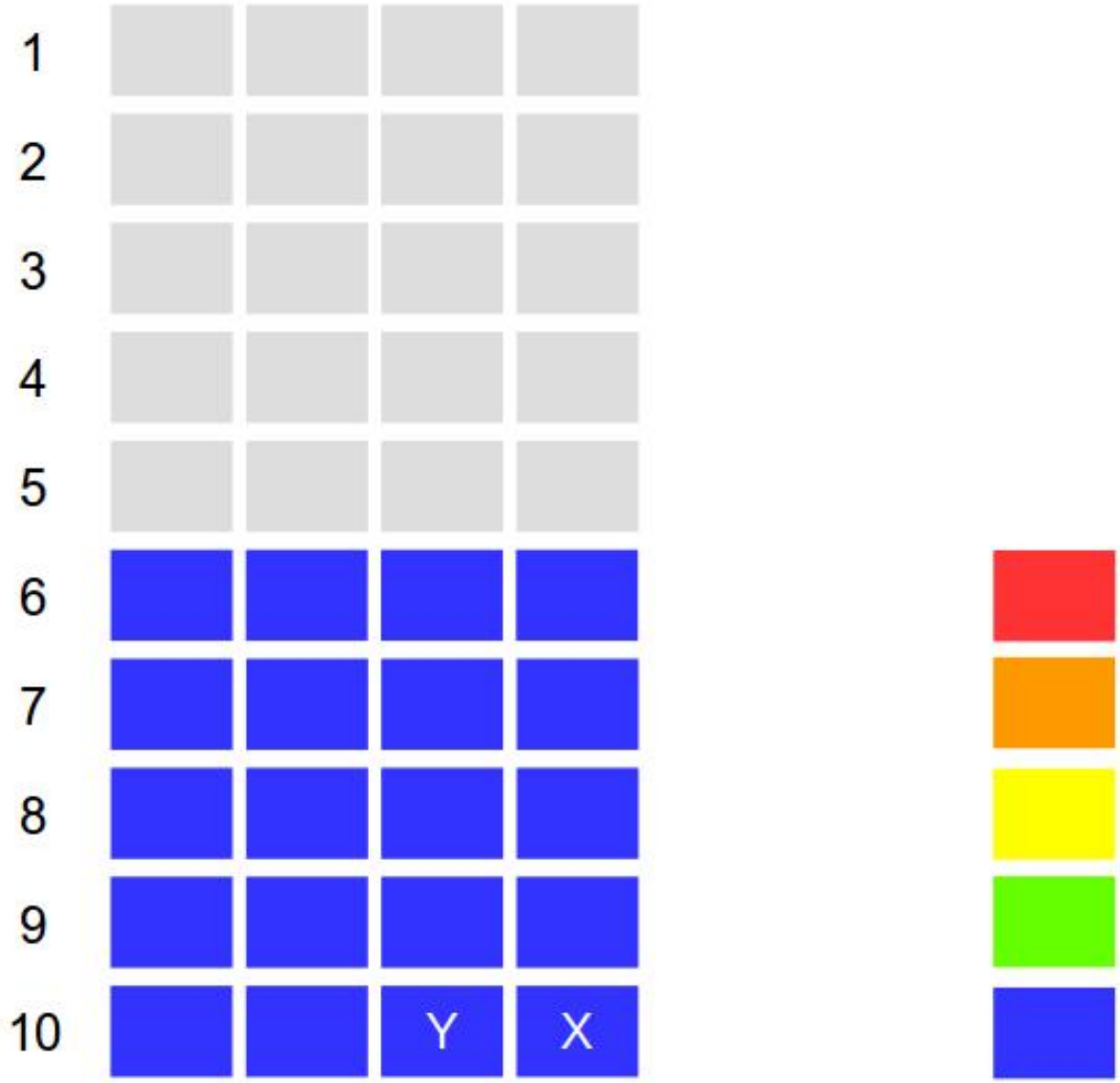
Operations – 4-1) Down



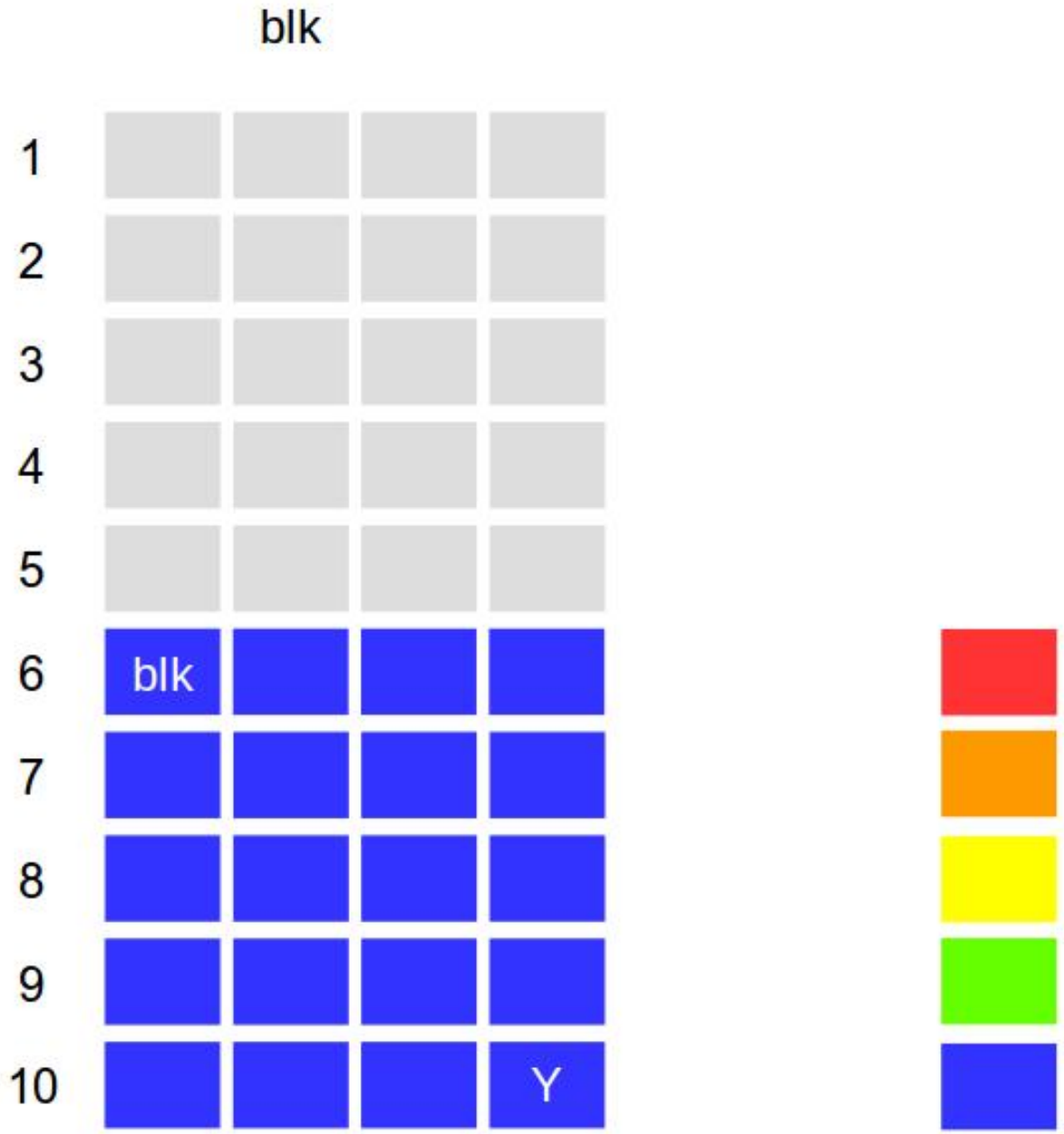
Operations – 4-1) Down



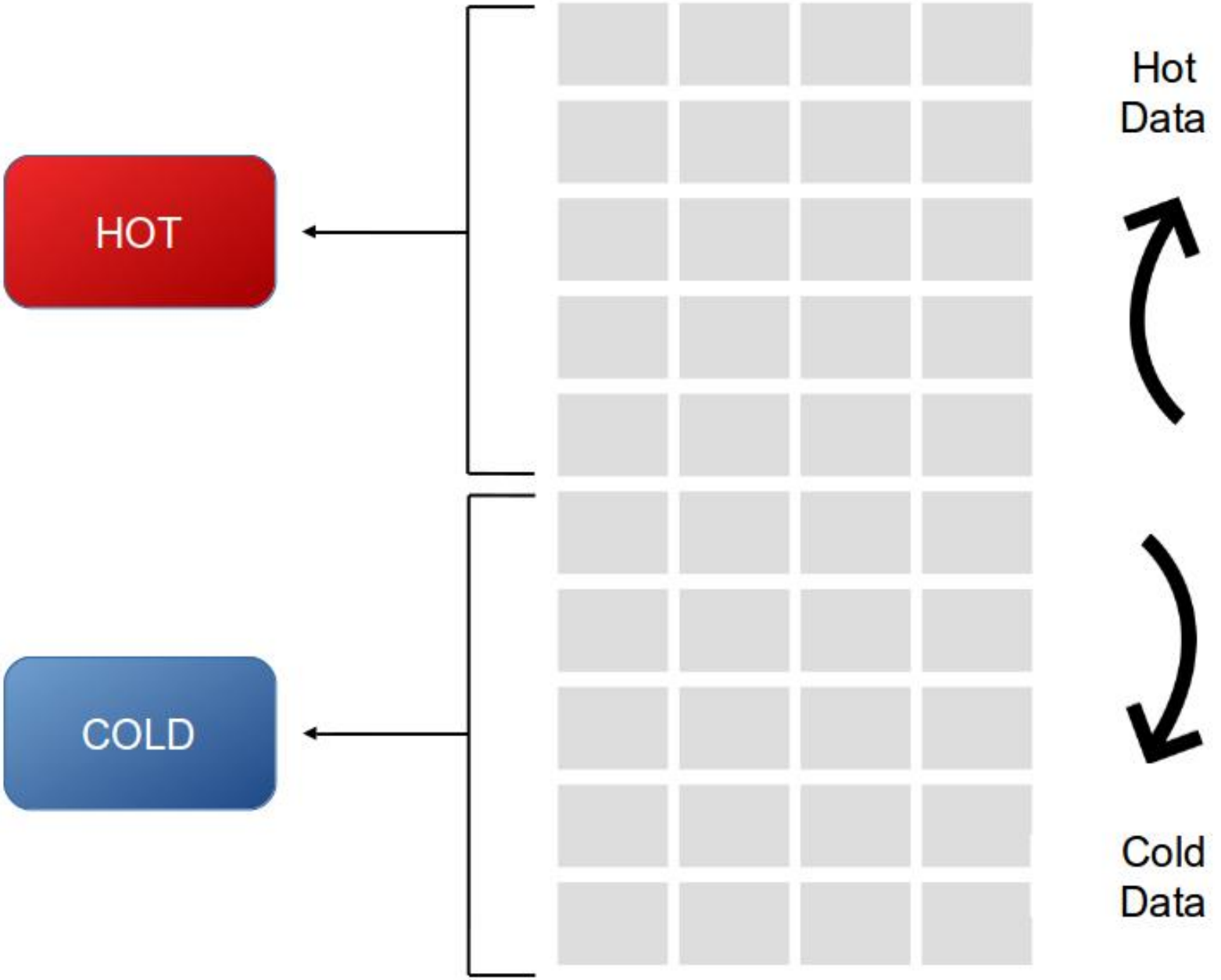
Operations – 2) Remove



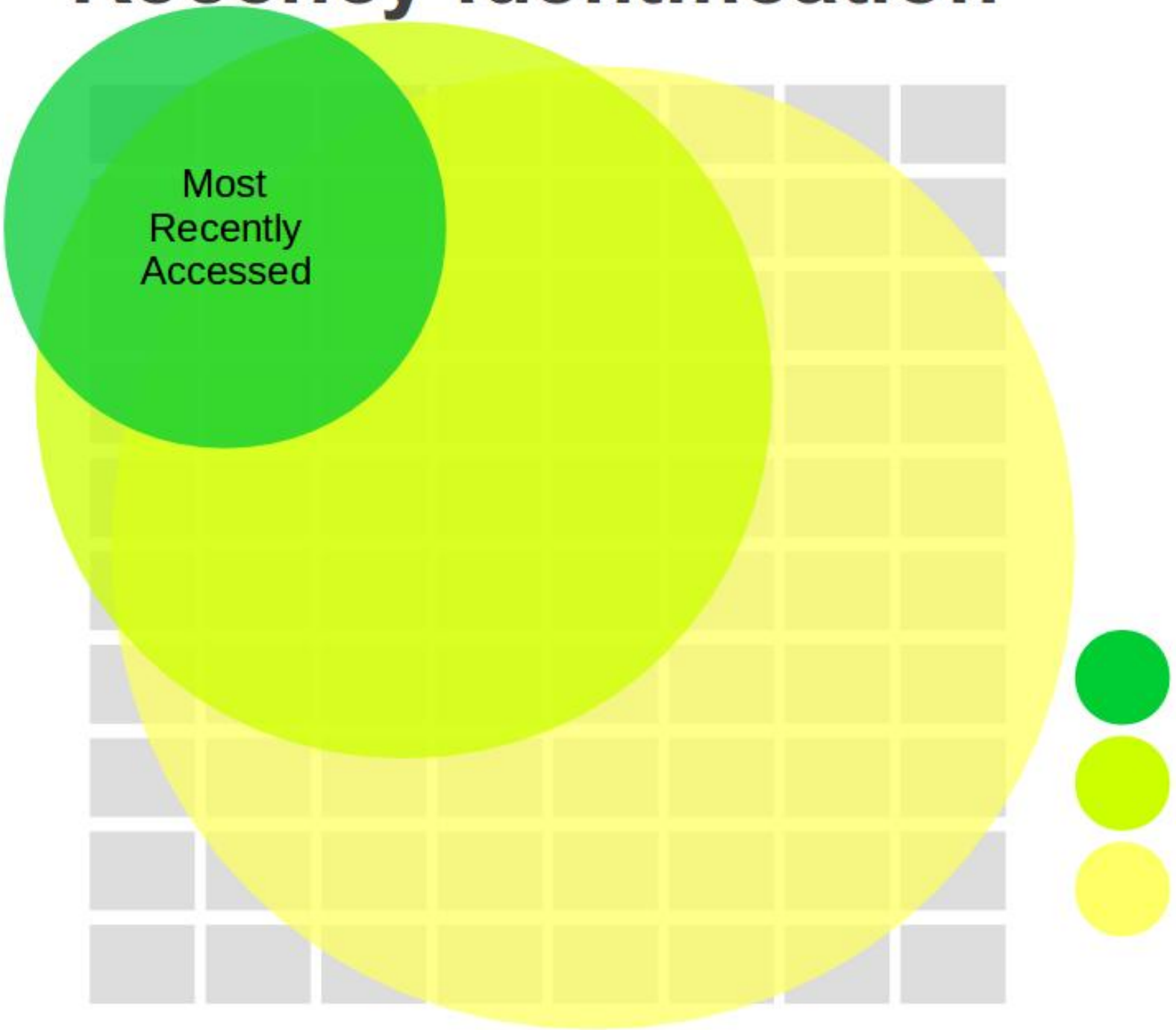
Operations – 2) Remove



Frequency identification



Recency identification



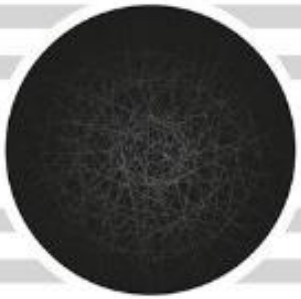
Deploying ‘Stack Distance’

Idea 1

=> Variable Maximum Size of Each List

Idea 2

=> …

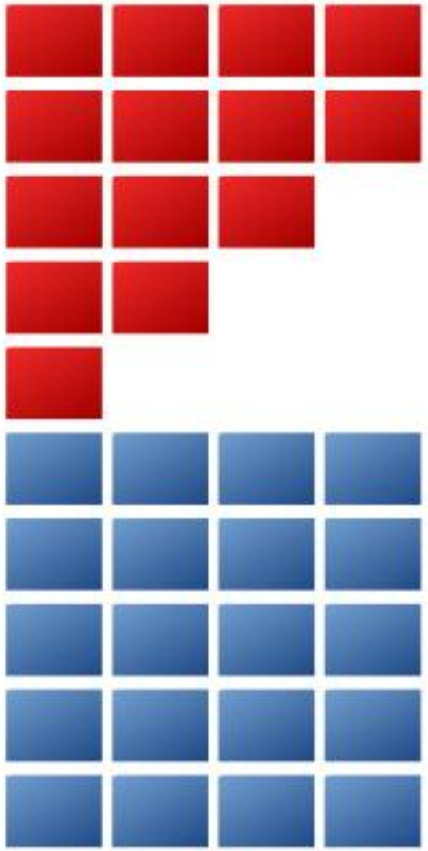


Deploying ‘Stack Distance’

If (stack distance > threashold) then :
increase HOT area sz_limit

Deploying ‘Stack Distance’

If (stack distance > threashold) then :
decrease HOT area sz_limit



Thank you