

# Analysis of memory requirements for a sequential implementation

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**Panasonic Corporation**

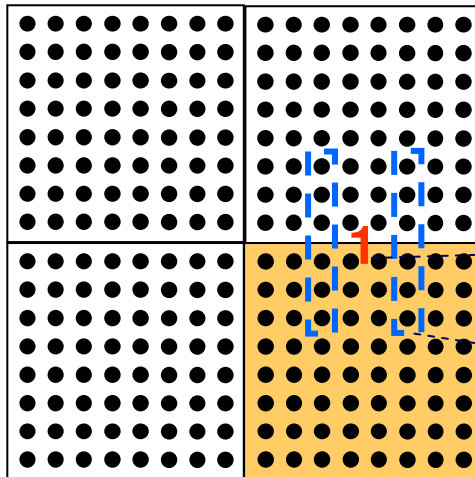
**Panasonic ideas for life**

*5th JCT-VC meeting, Geneva 16.-23. March 2011*

- Analysis for a coding unit CU of the size 8x8
- Analysis for a coding unit CU of the size 16x16
- Analysis for a coding unit CU of the size 32x32
- Summary

# Proposed deblocking steps for a CU of size 8x8

3

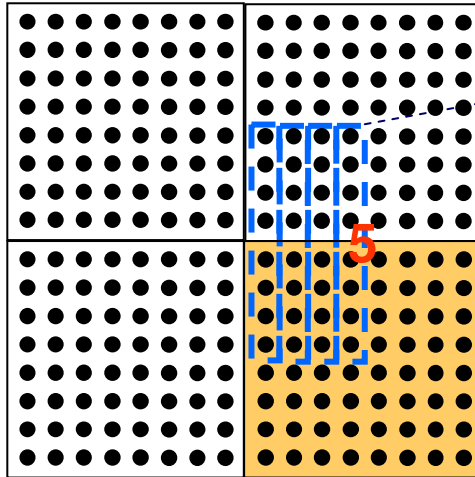


Number of bits required  
to store a decision

Compute decision filter  
on/off and store

# Proposed deblocking steps for a CU of size 8x8

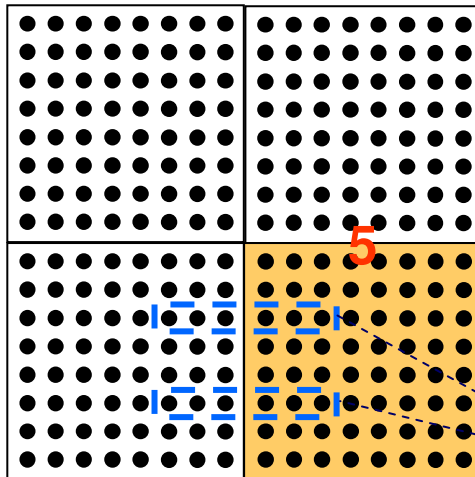
4



Compute decisions weak/strong filter and store

# Proposed deblocking steps for a CU of size 8x8

5

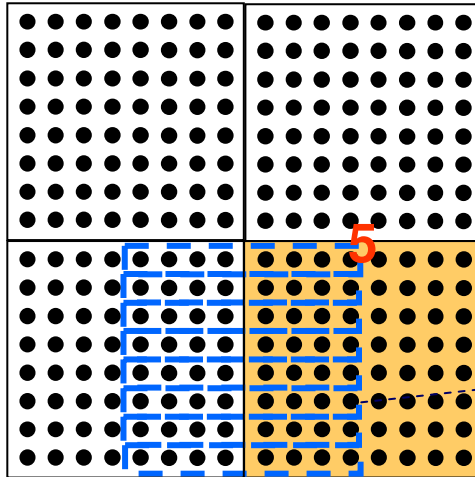


This shows worst case:  
5 bit

Compute decision filter on/off

# Proposed deblocking steps for a CU of size 8x8

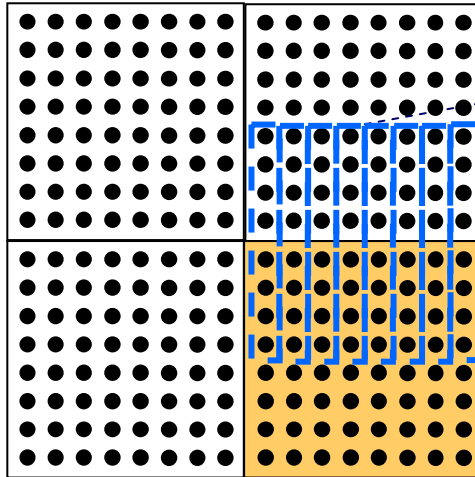
6



Compute decisions weak/strong filter and filter

# Proposed deblocking steps for a CU of size 8x8

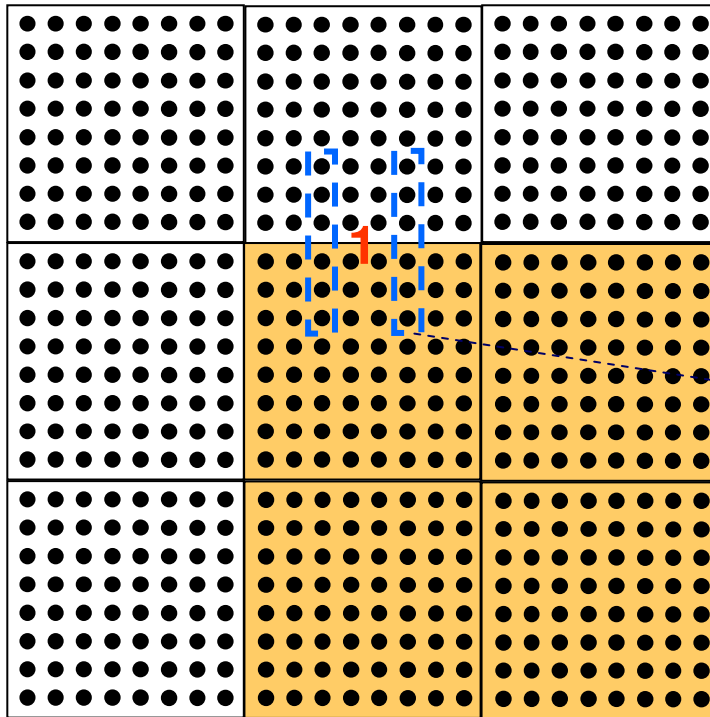
7



Retrieve decisions from storage and filter  
(1 bit)

# Proposed deblocking steps for a CU of size

8

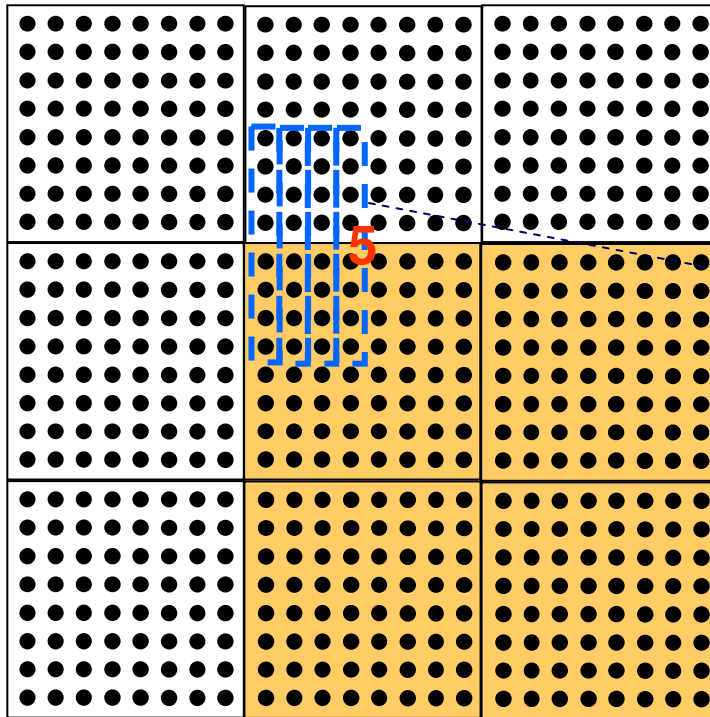


Compute decision filter  
on/off and store



# Proposed deblocking steps for a CU of size

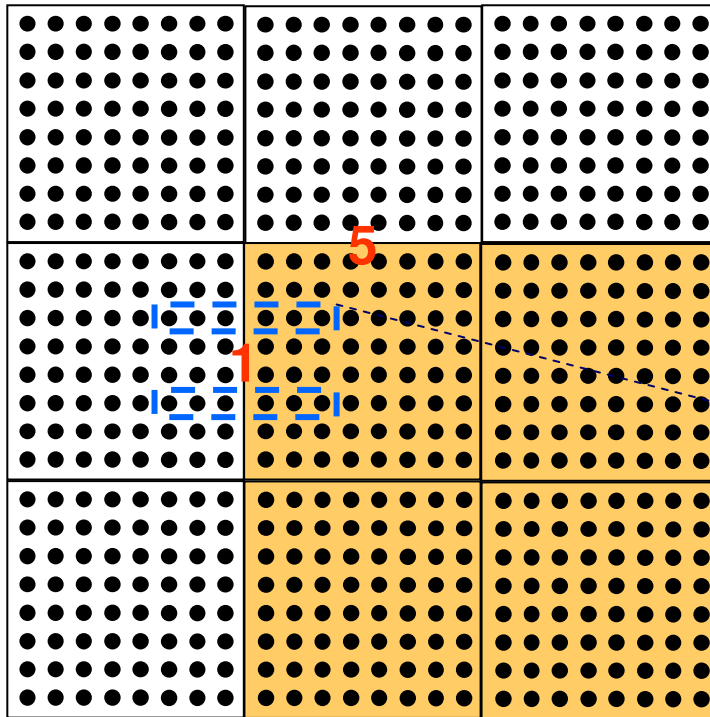
9



Compute decisions weak/strong  
filter and store

# Proposed deblocking steps for a CU of size

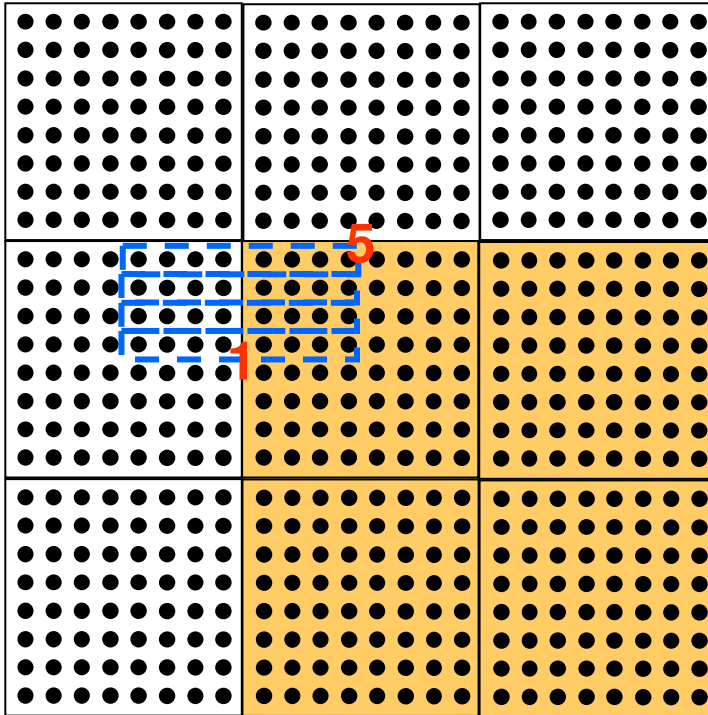
10



Compute decision filter on/off

# Proposed deblocking steps for a CU of size

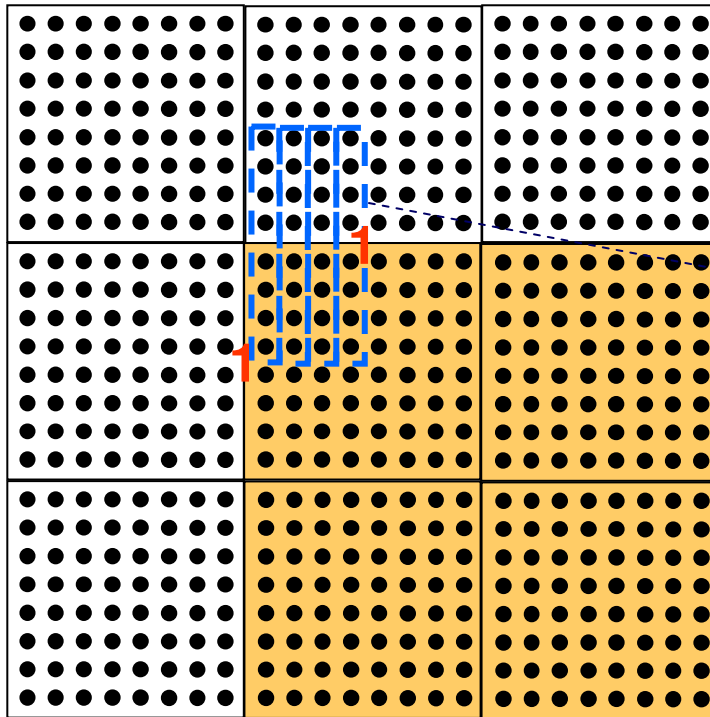
11



Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size 12

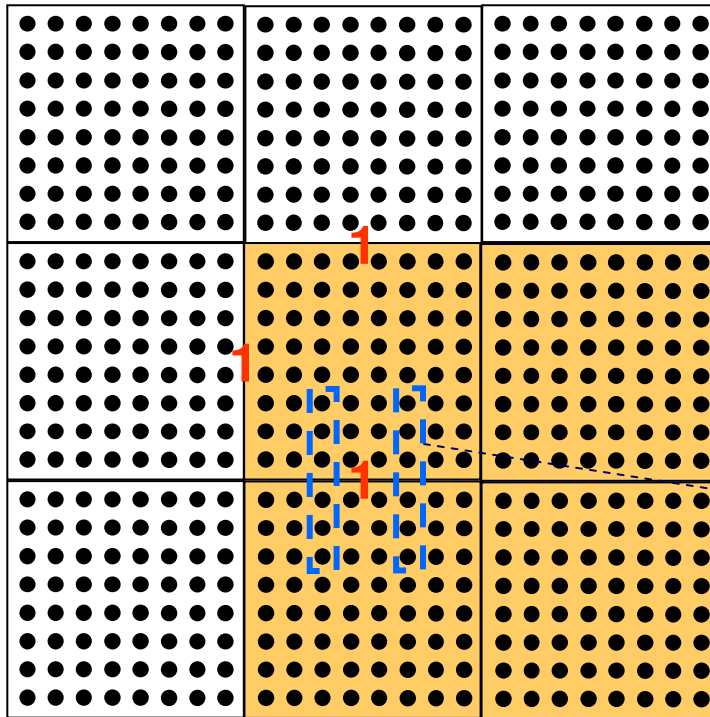
12



### Retrieve decisions and filter

# Proposed deblocking steps for a CU of size

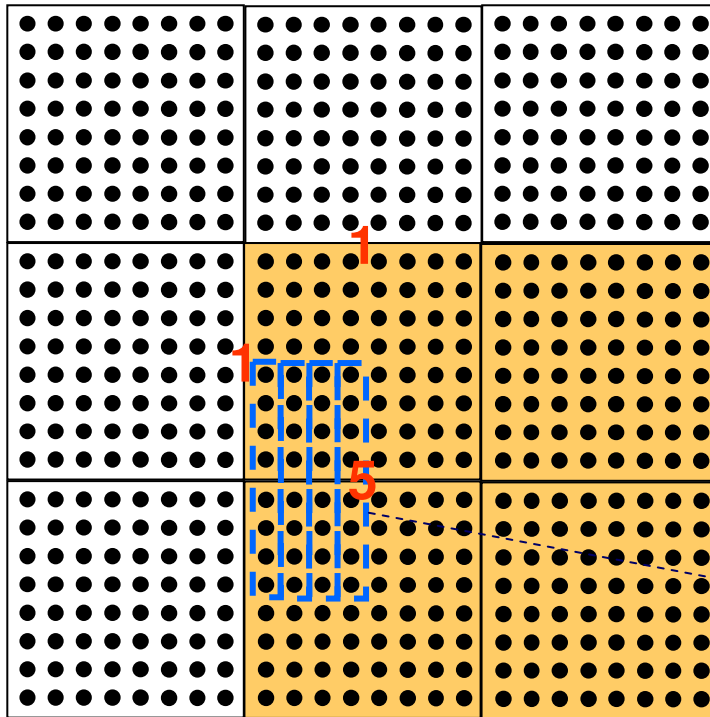
13



Compute decision filter  
on/off and store

# Proposed deblocking steps for a CU of size

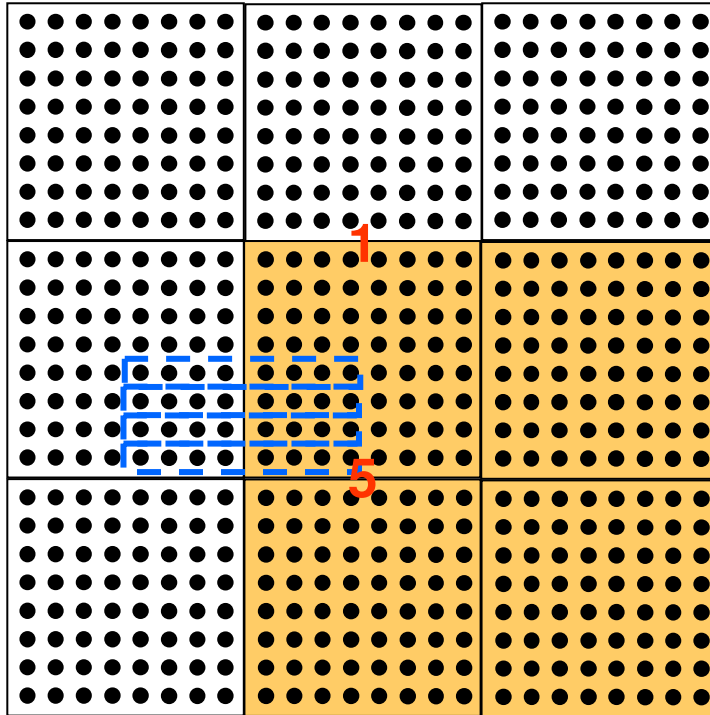
14



Compute decisions weak/strong  
filter and store

# Proposed deblocking steps for a CU of size

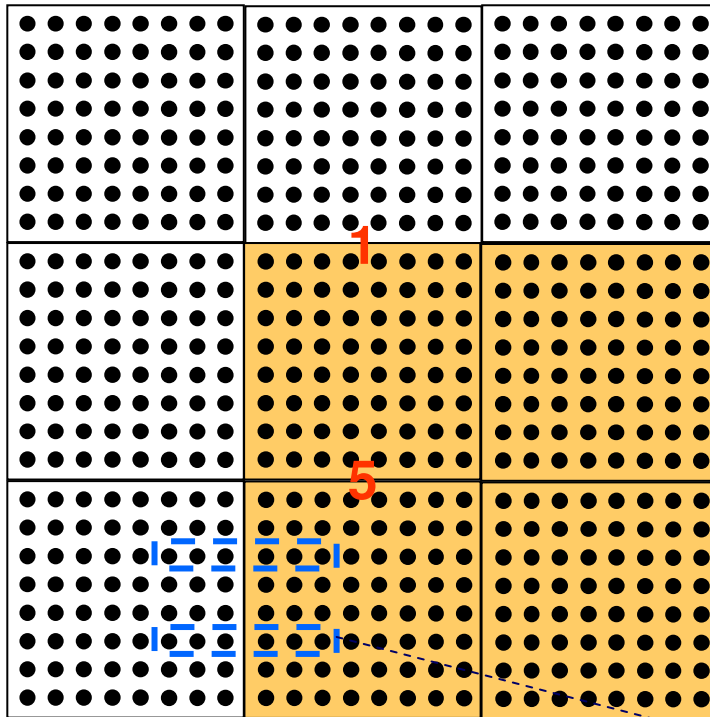
15



Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size

16

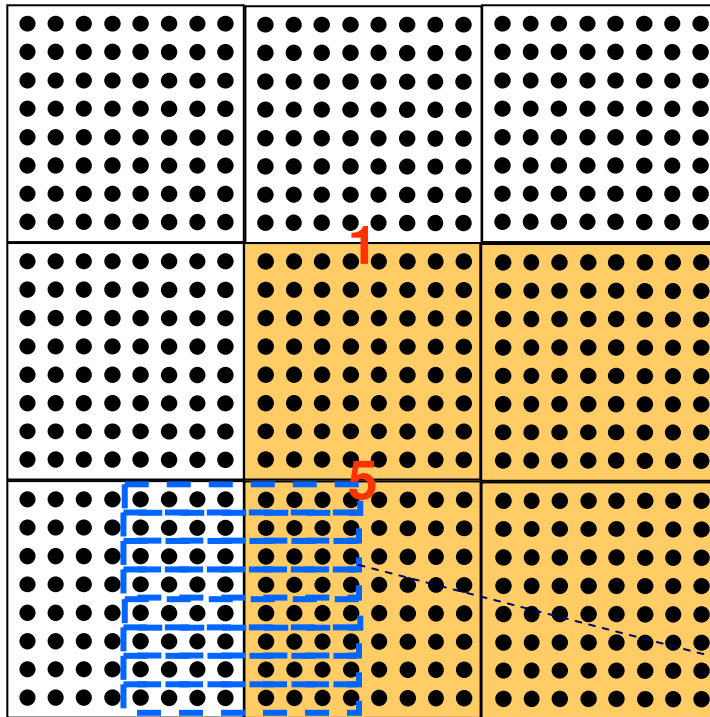


Compute decision filter on/off



# Proposed deblocking steps for a CU of size

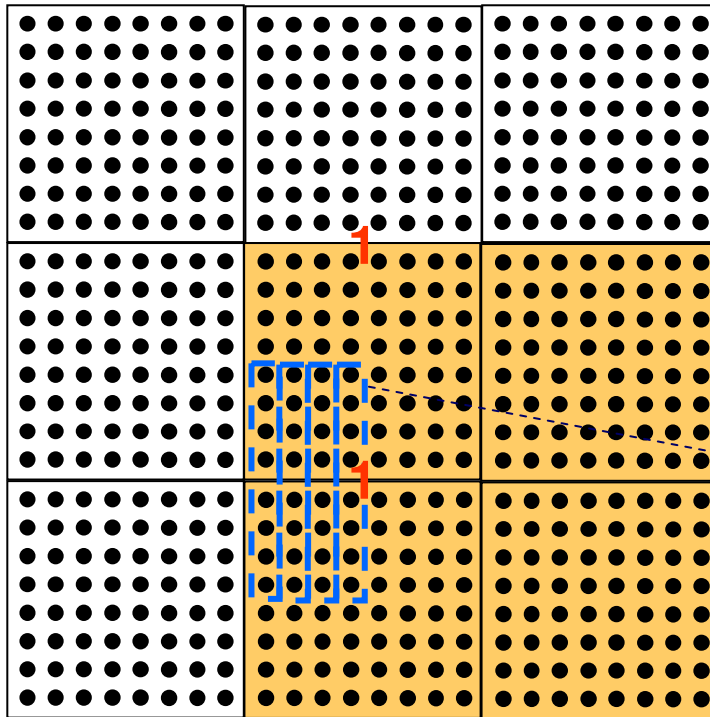
17



Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size

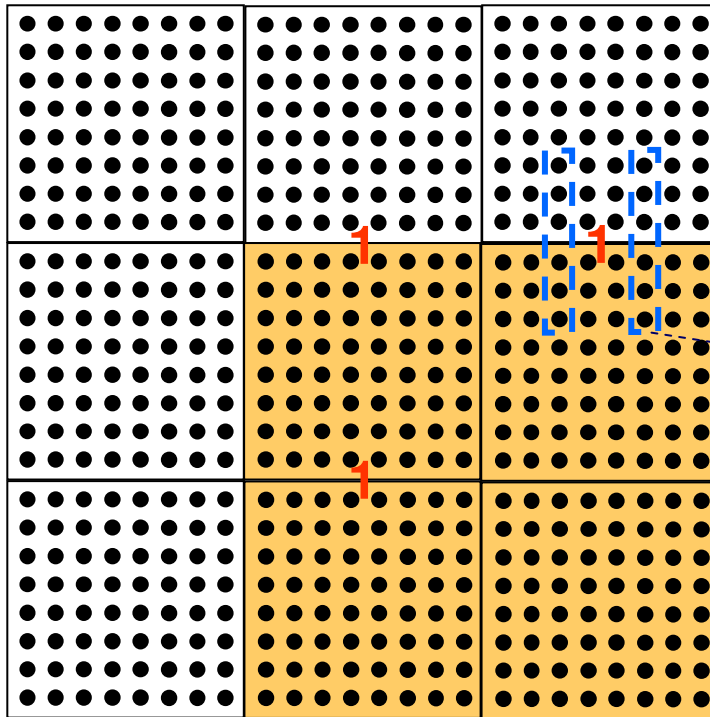
18



Retrieve decisions and filter

# Proposed deblocking steps for a CU of size

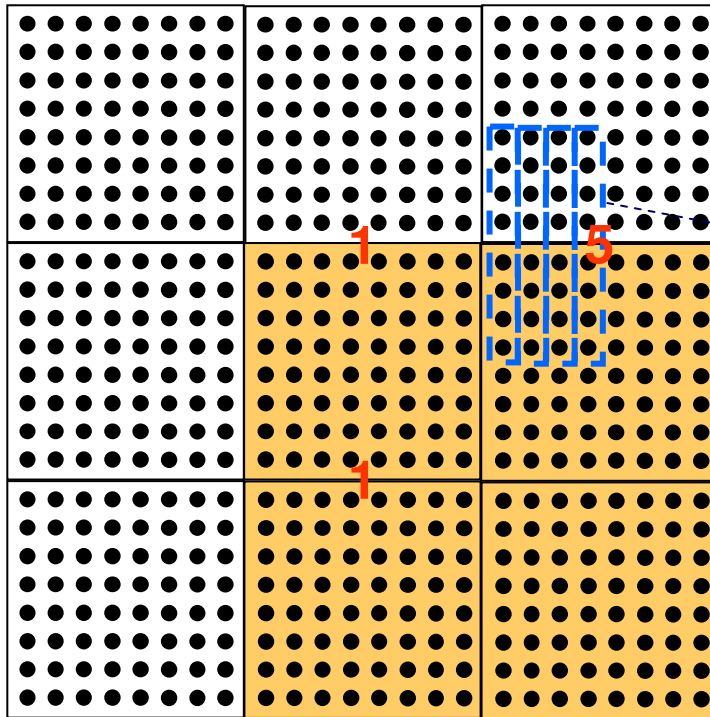
19



Compute decision filter  
on/off and store

# Proposed deblocking steps for a CU of size

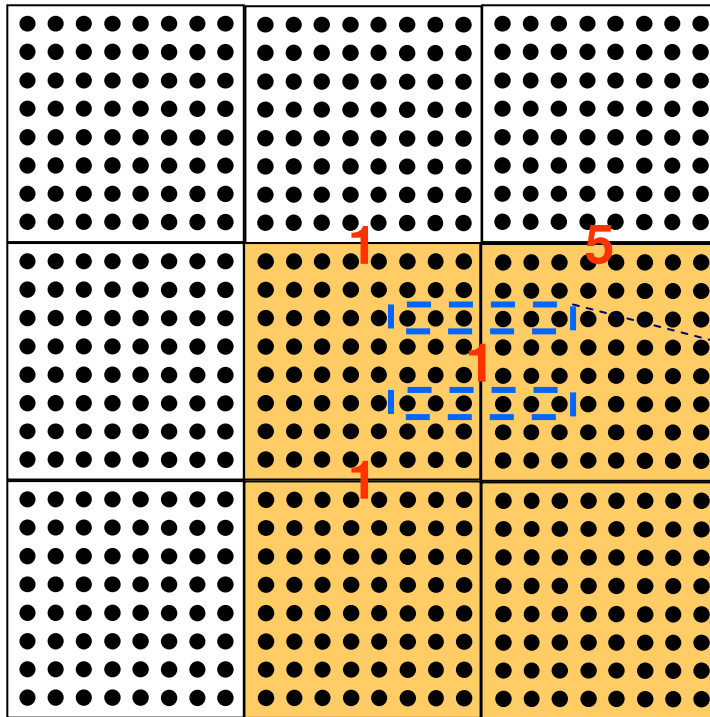
20



Compute decisions weak/strong  
filter and store

# Proposed deblocking steps for a CU of size

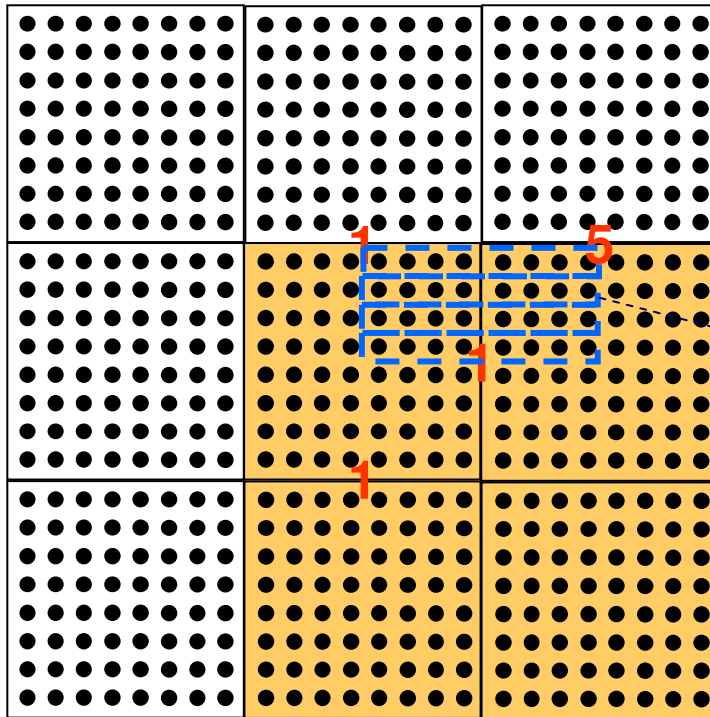
21



Compute decision filter on/off

# Proposed deblocking steps for a CU of size

22

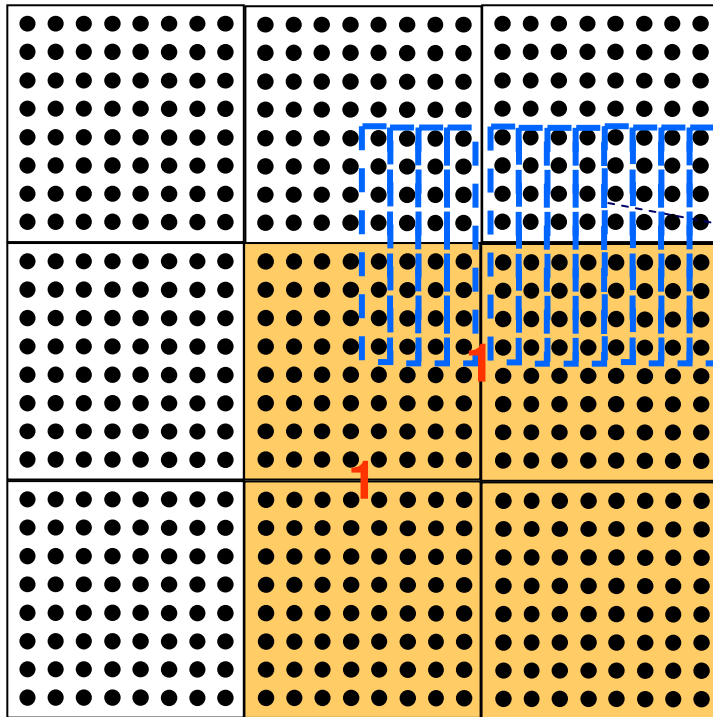


This shows worst case:  
8 bit

Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size

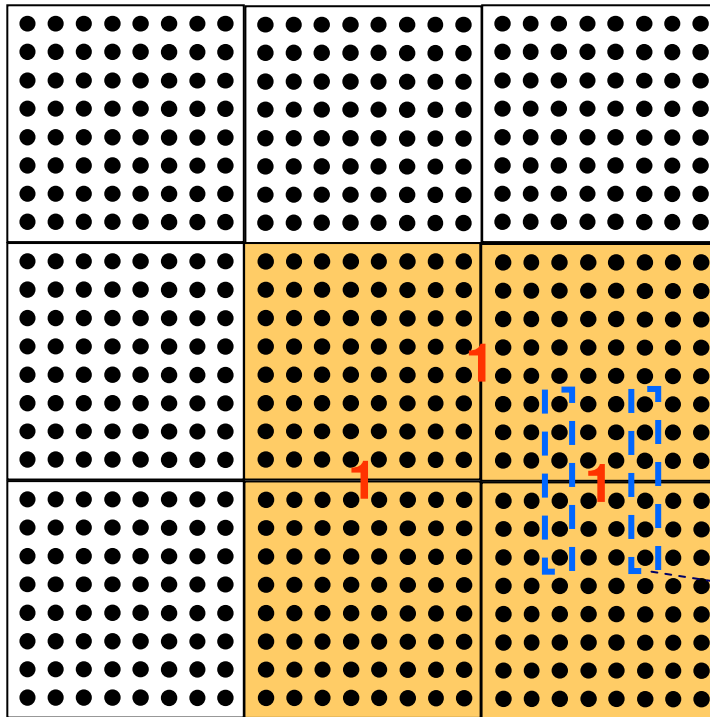
23



Retrieve decisions and filter

# Proposed deblocking steps for a CU of size

24

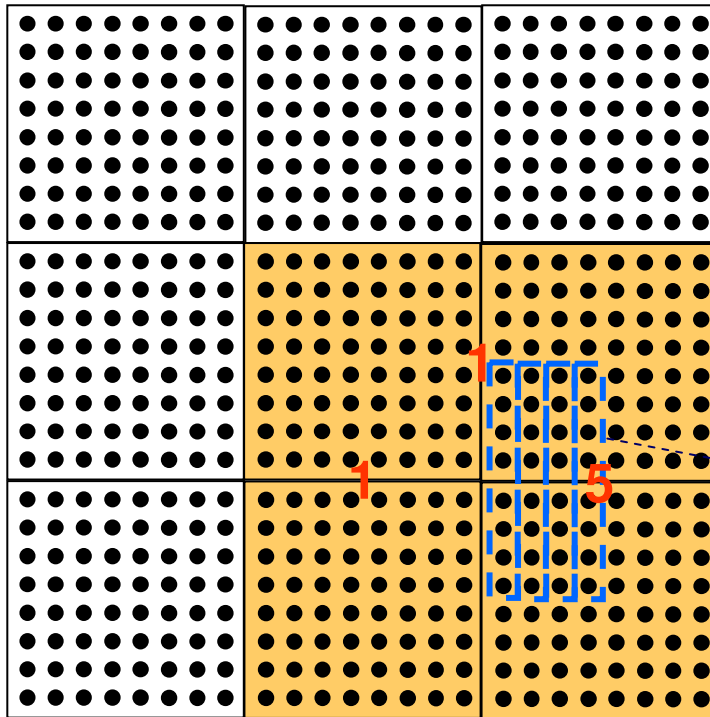


Compute decision filter  
on/off and store



# Proposed deblocking steps for a CU of size

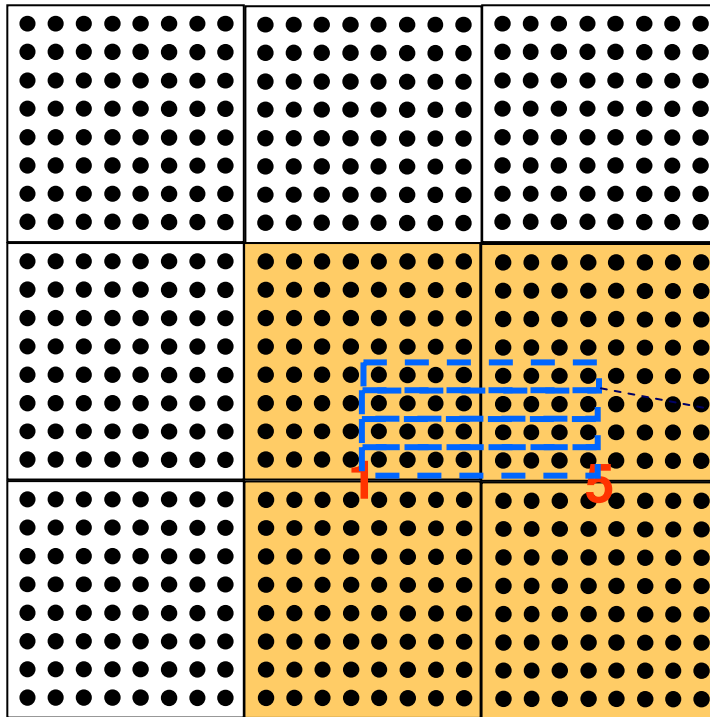
25



Compute decisions weak/strong  
filter and store

# Proposed deblocking steps for a CU of size

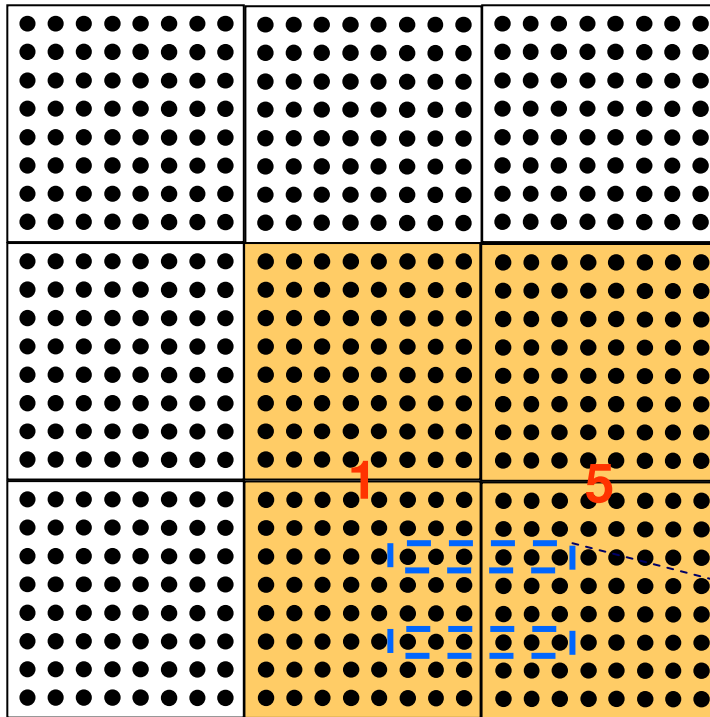
26



Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size

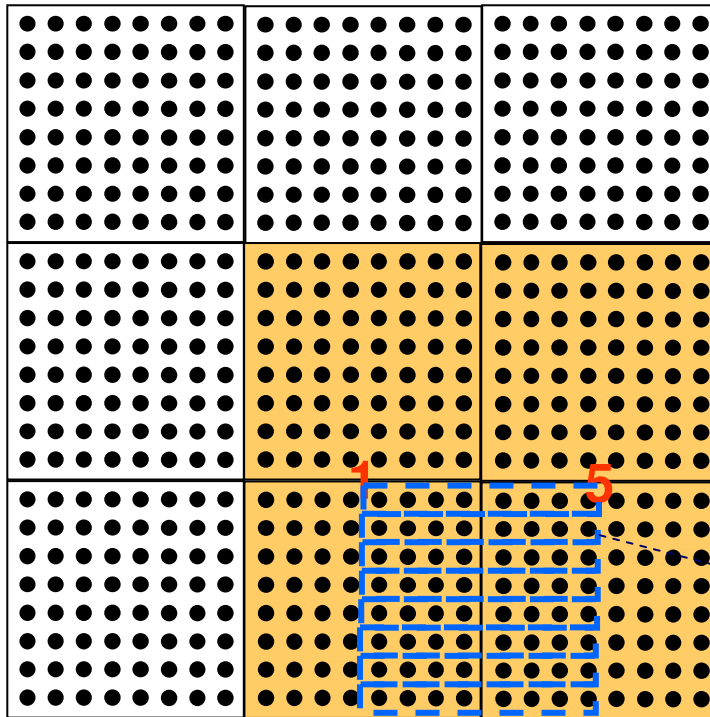
27



Compute decision filter on/off

# Proposed deblocking steps for a CU of size

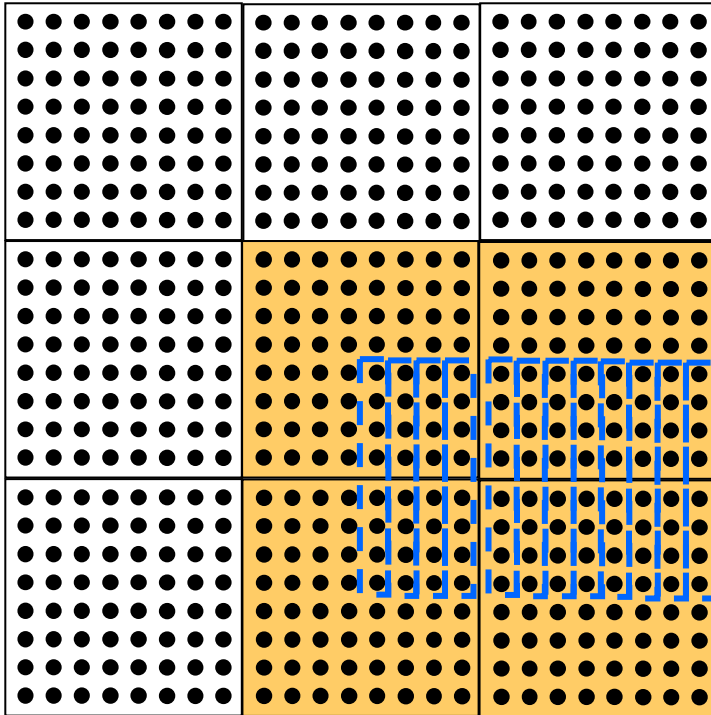
28



Compute decisions  
weak/strong filter and filter

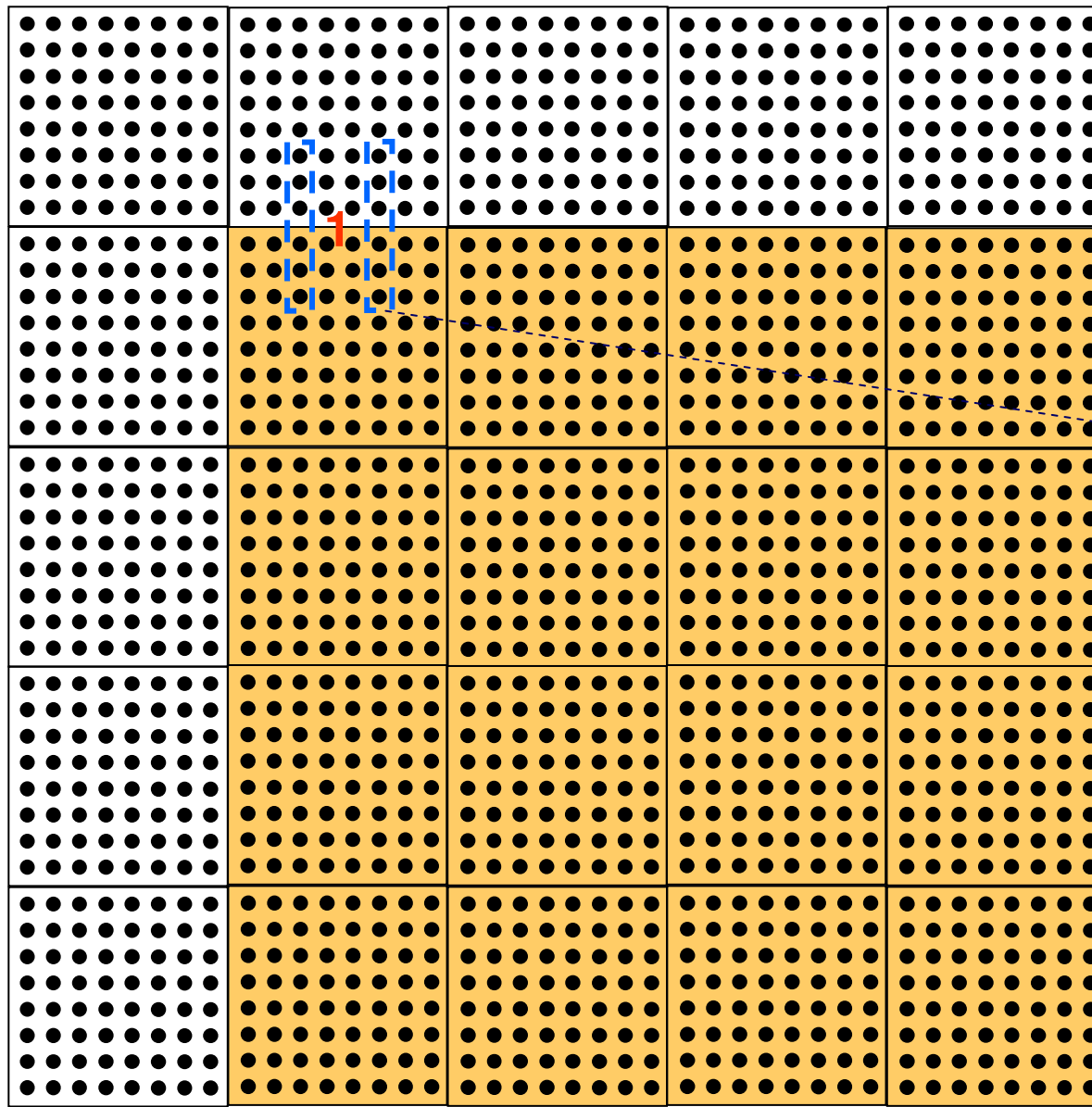
# Proposed deblocking steps for a CU of size

29



# Proposed deblocking steps for a CU of size

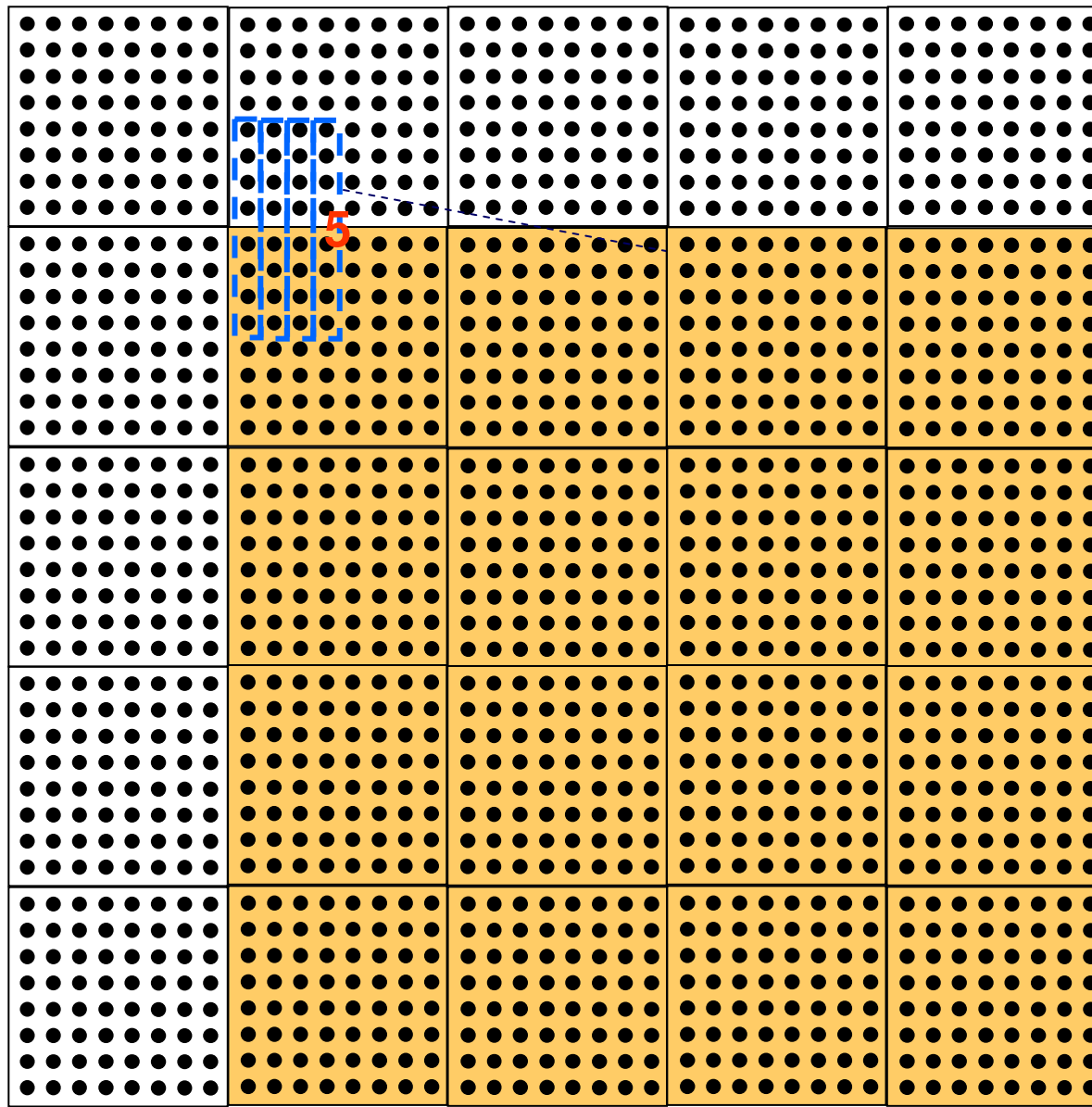
30



Compute decision filter  
on/off and store

# Proposed deblocking steps for a CU of size

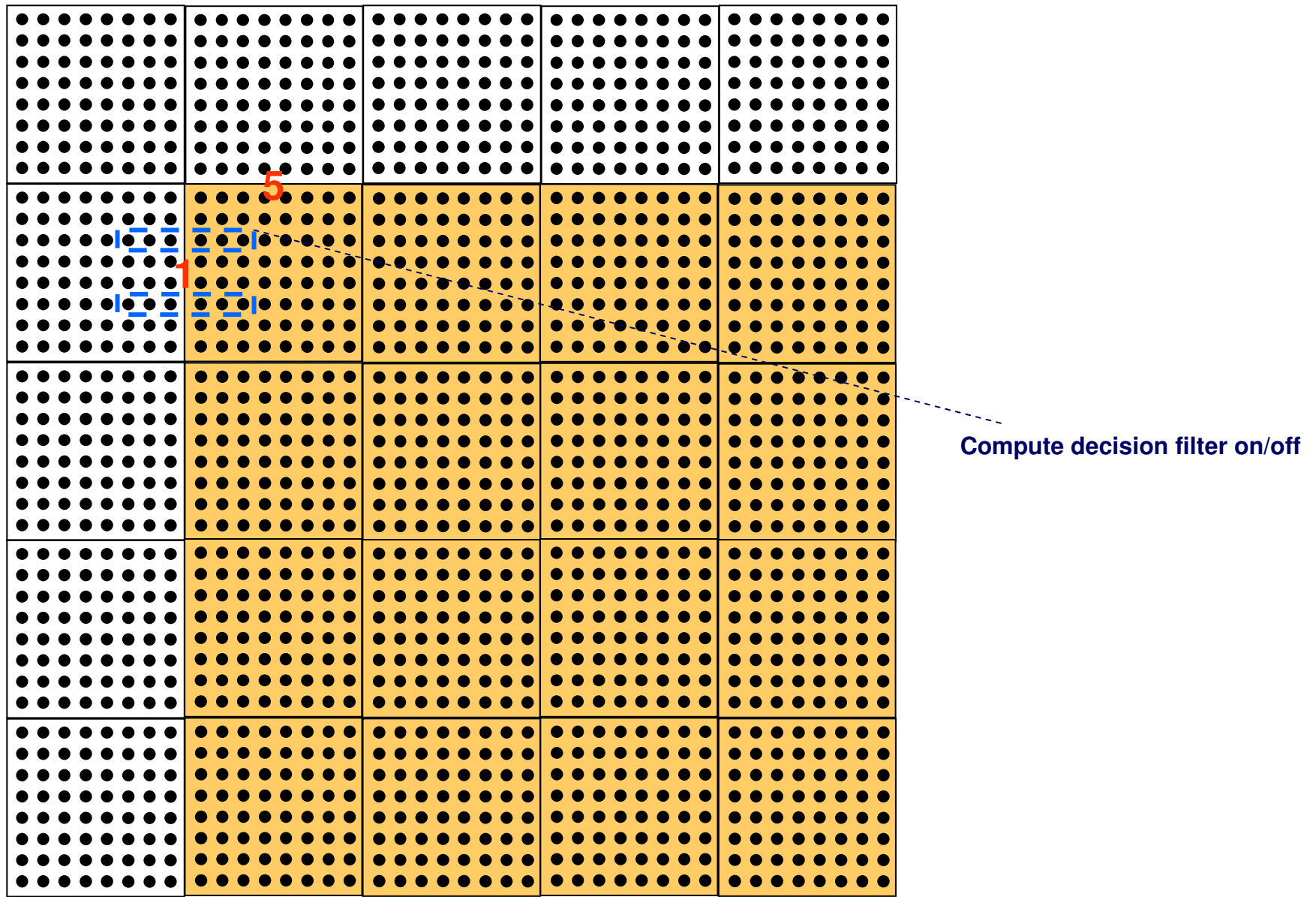
31



Compute decisions weak/strong  
filter and store

# Proposed deblocking steps for a CU of size

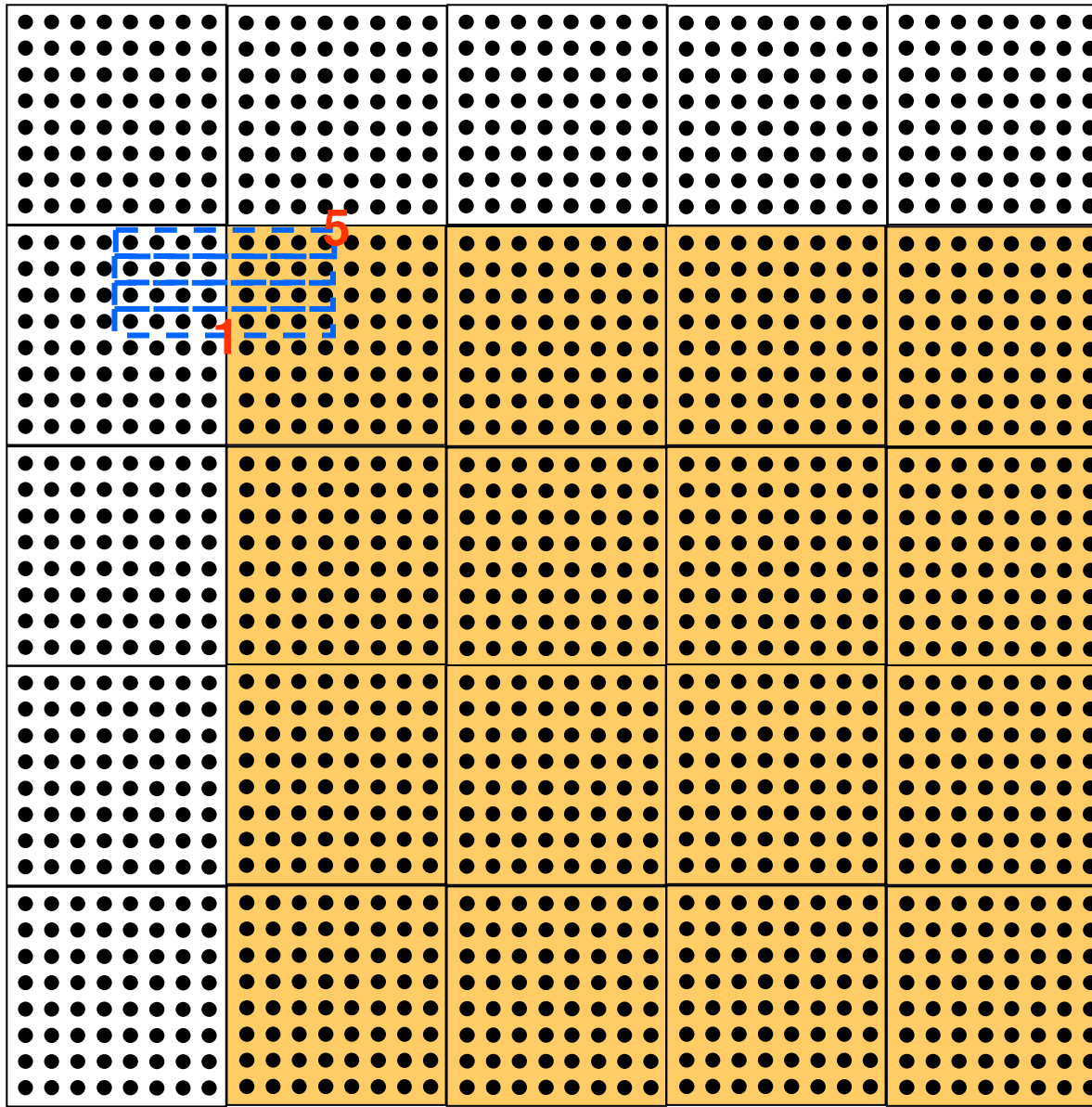
32





# Proposed deblocking steps for a CU of size

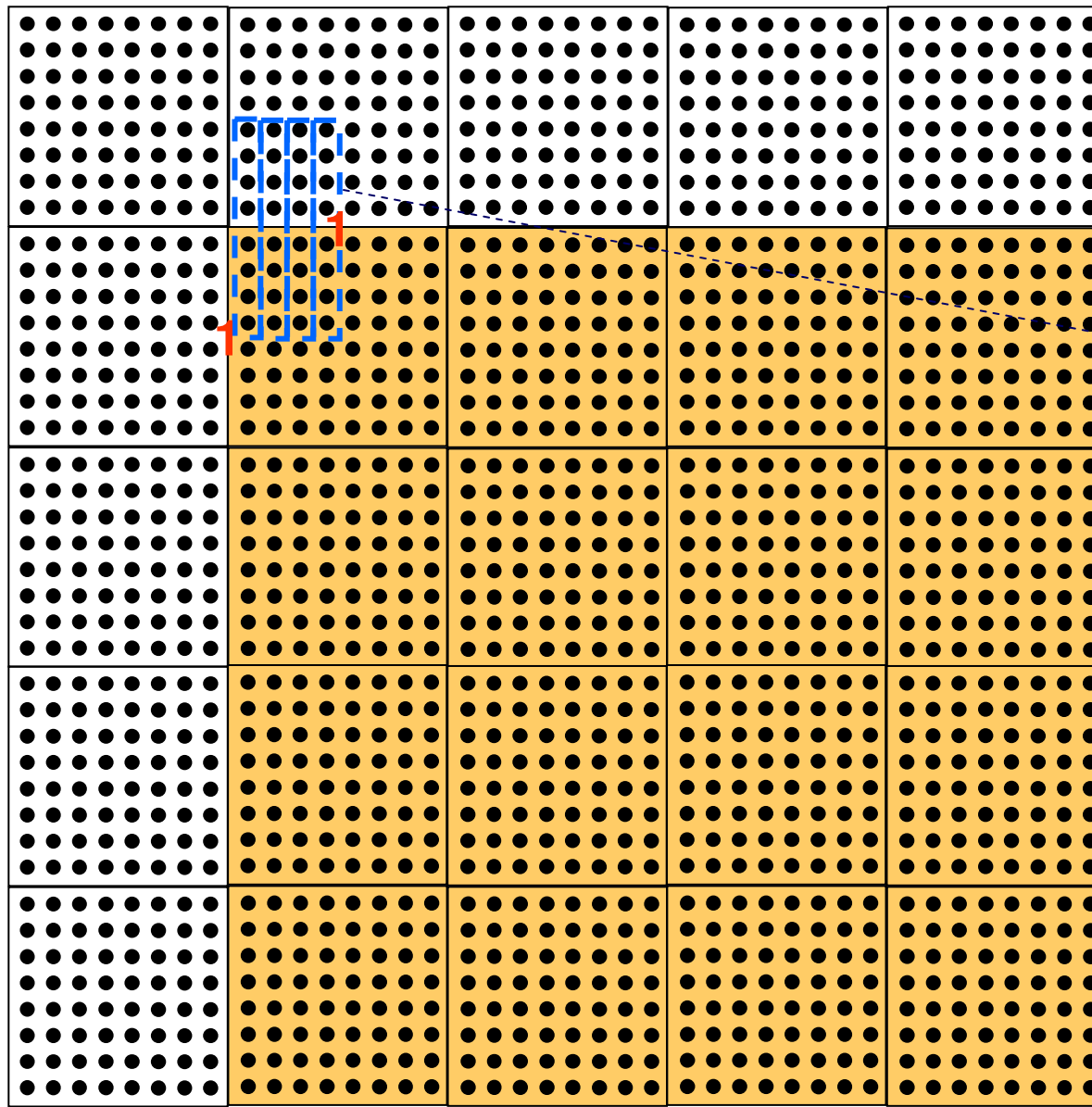
33



Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size

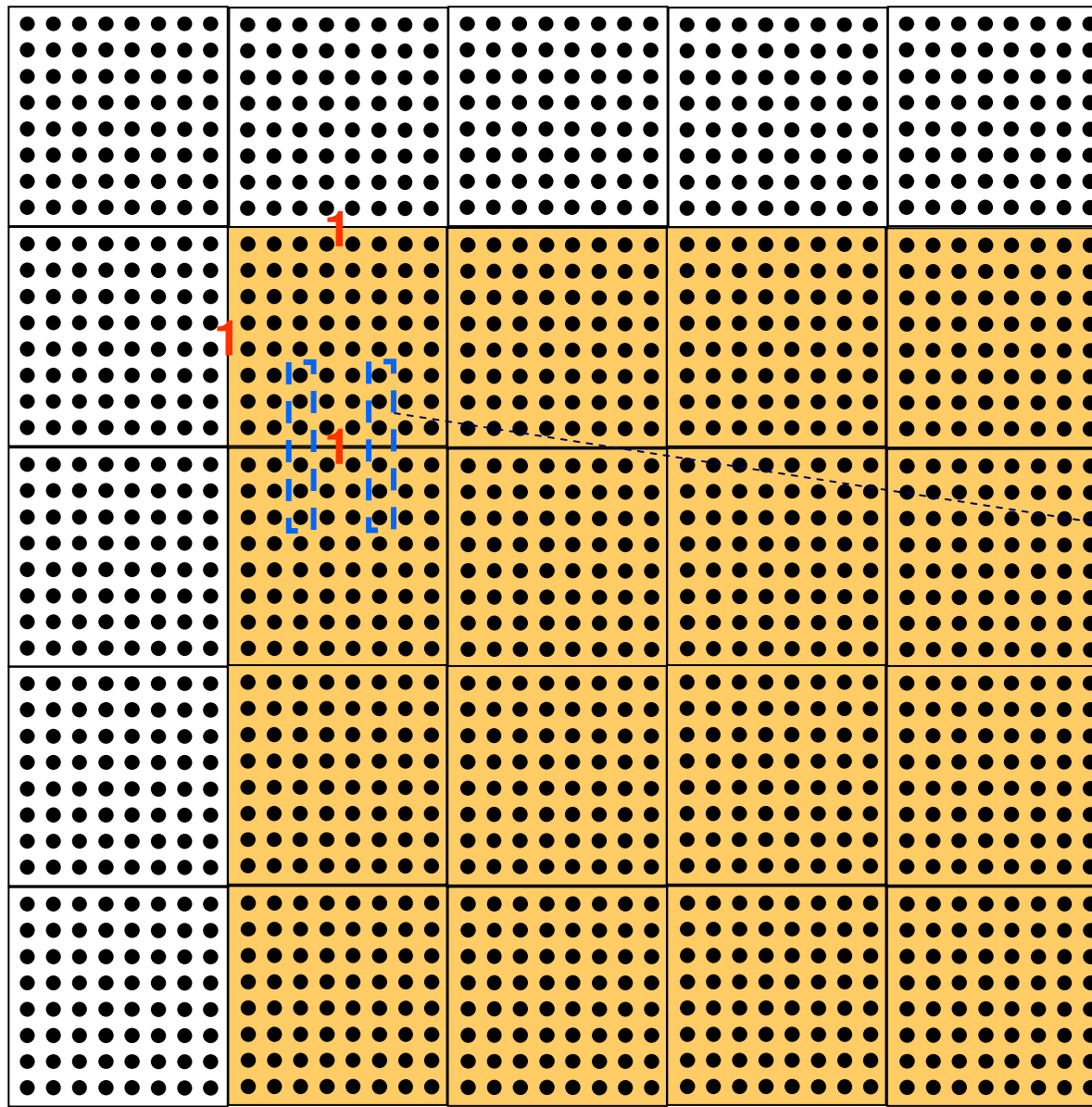
34



Retrieve decisions and filter

# Proposed deblocking steps for a CU of size

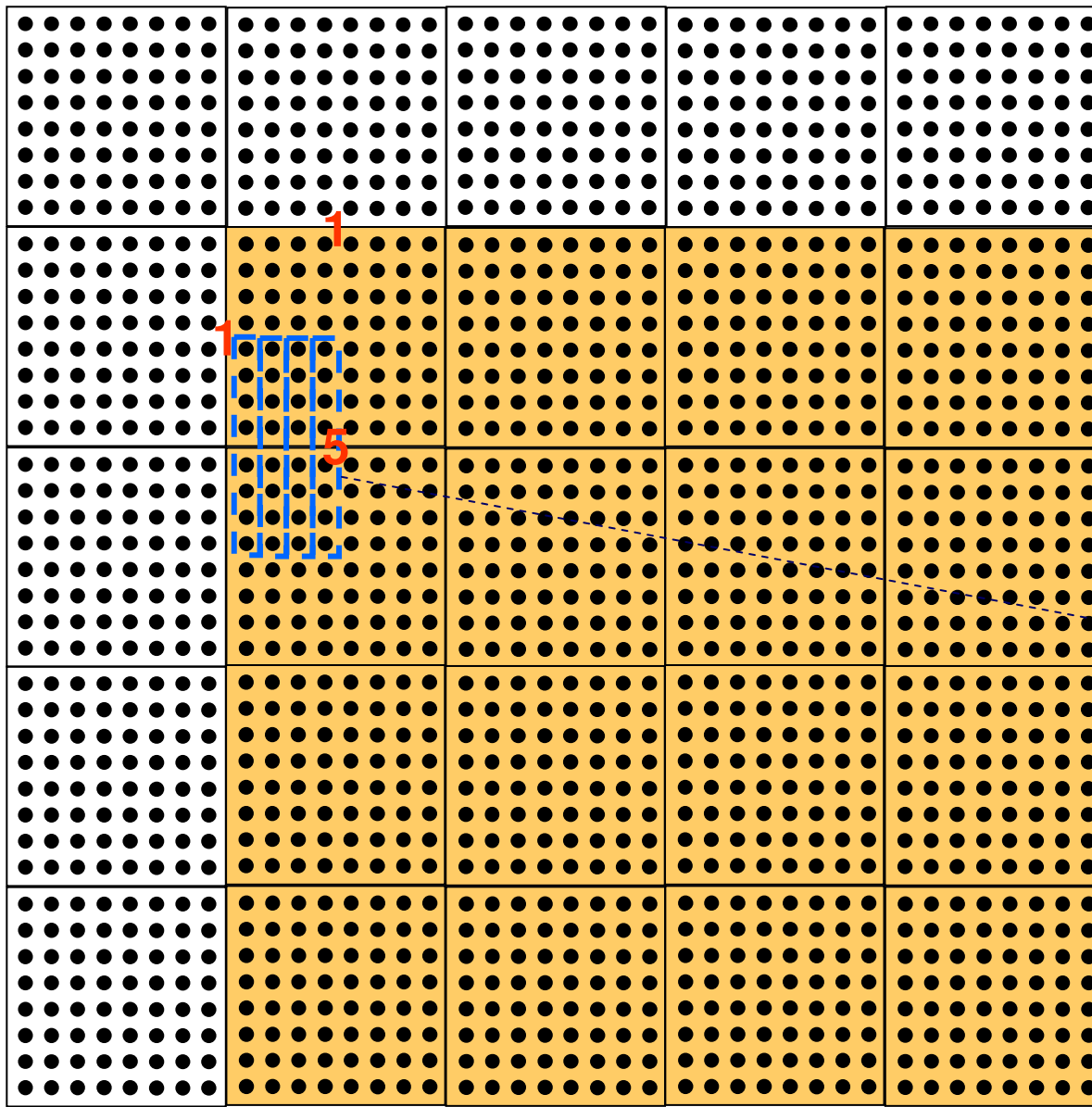
35



Compute decision filter  
on/off and store

# Proposed deblocking steps for a CU of size

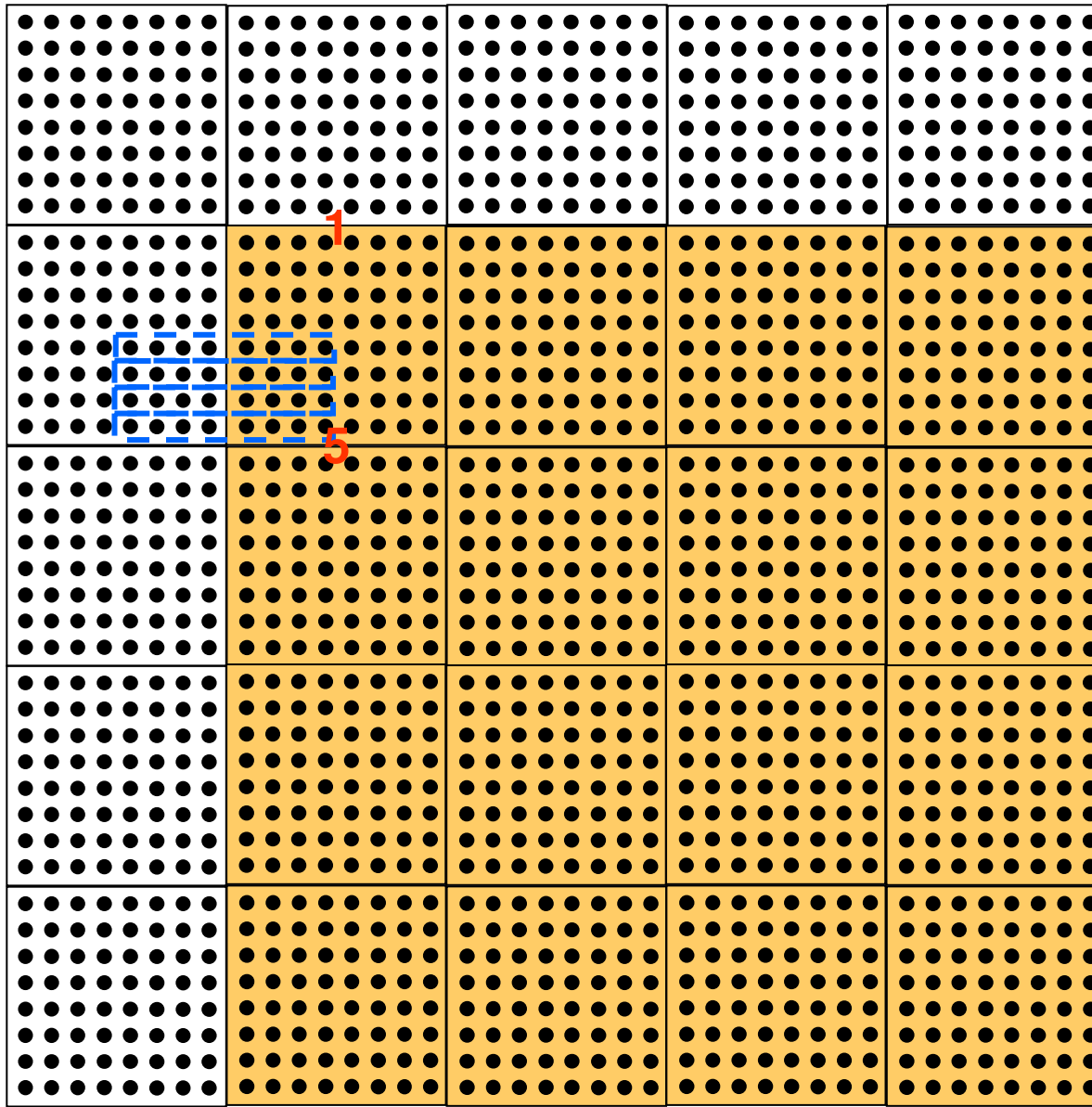
36



Compute decisions weak/strong  
filter and store

# Proposed deblocking steps for a CU of size

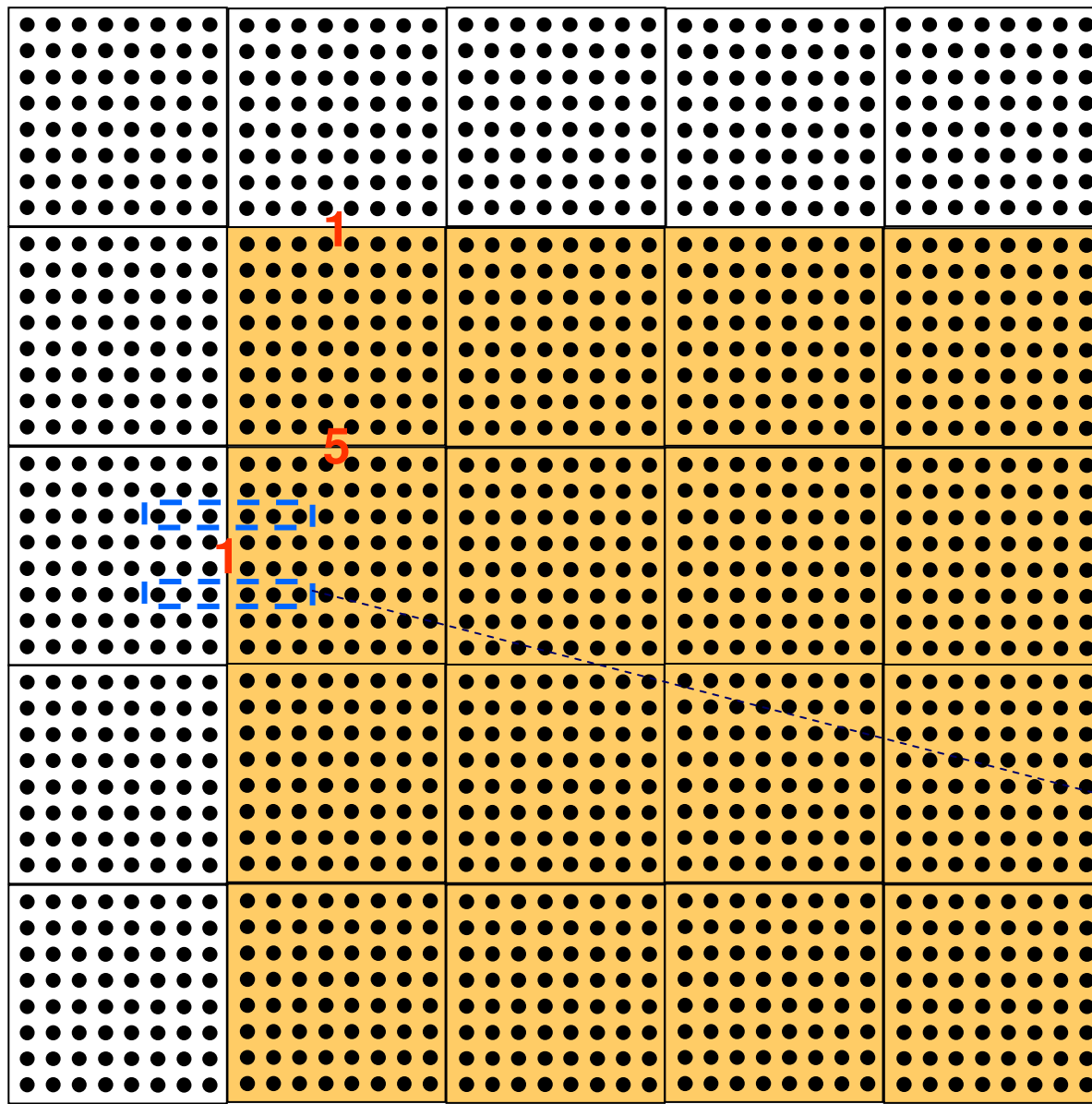
37



Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size

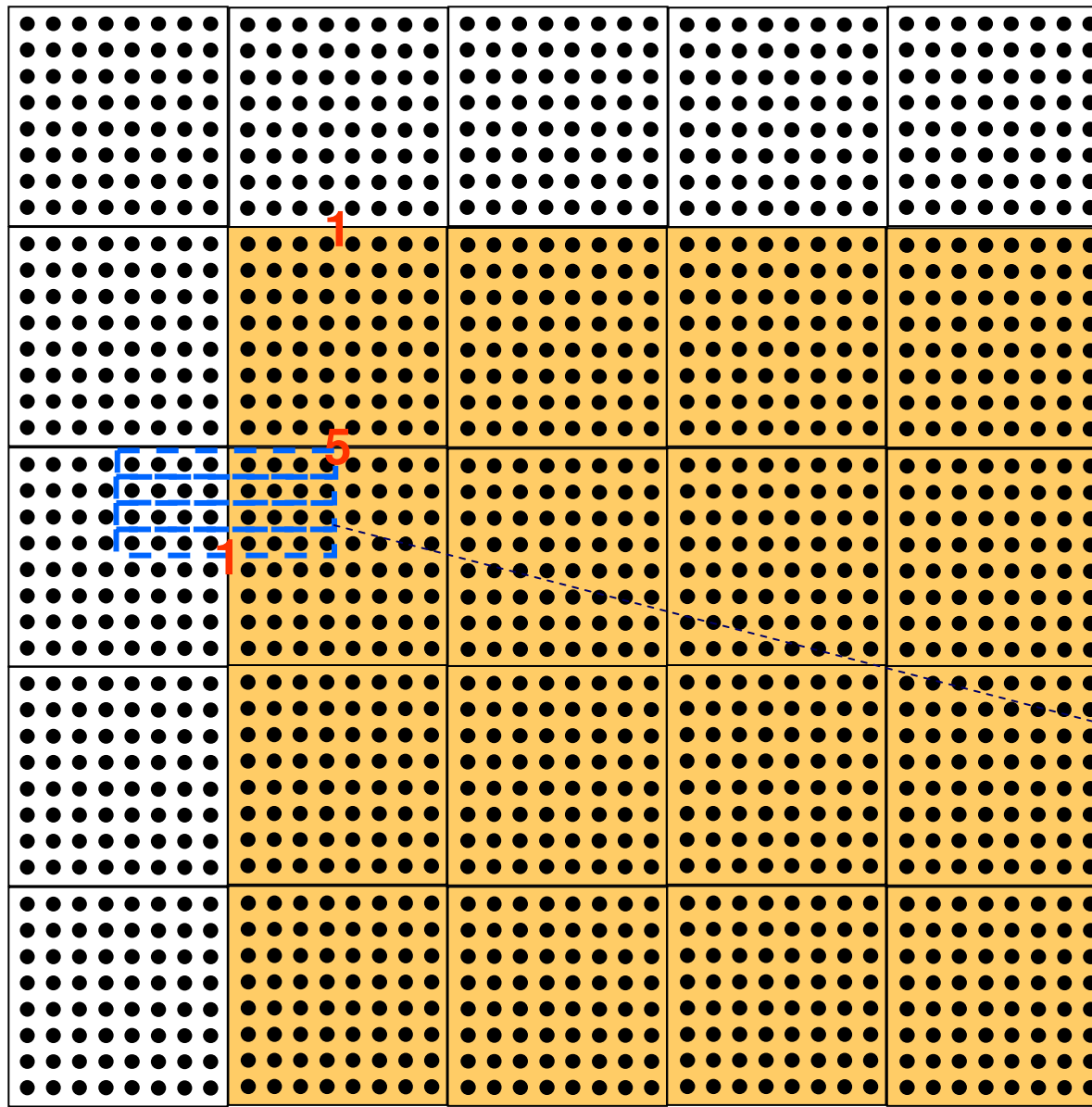
38



Compute decision filter on/off

# Proposed deblocking steps for a CU of size

39

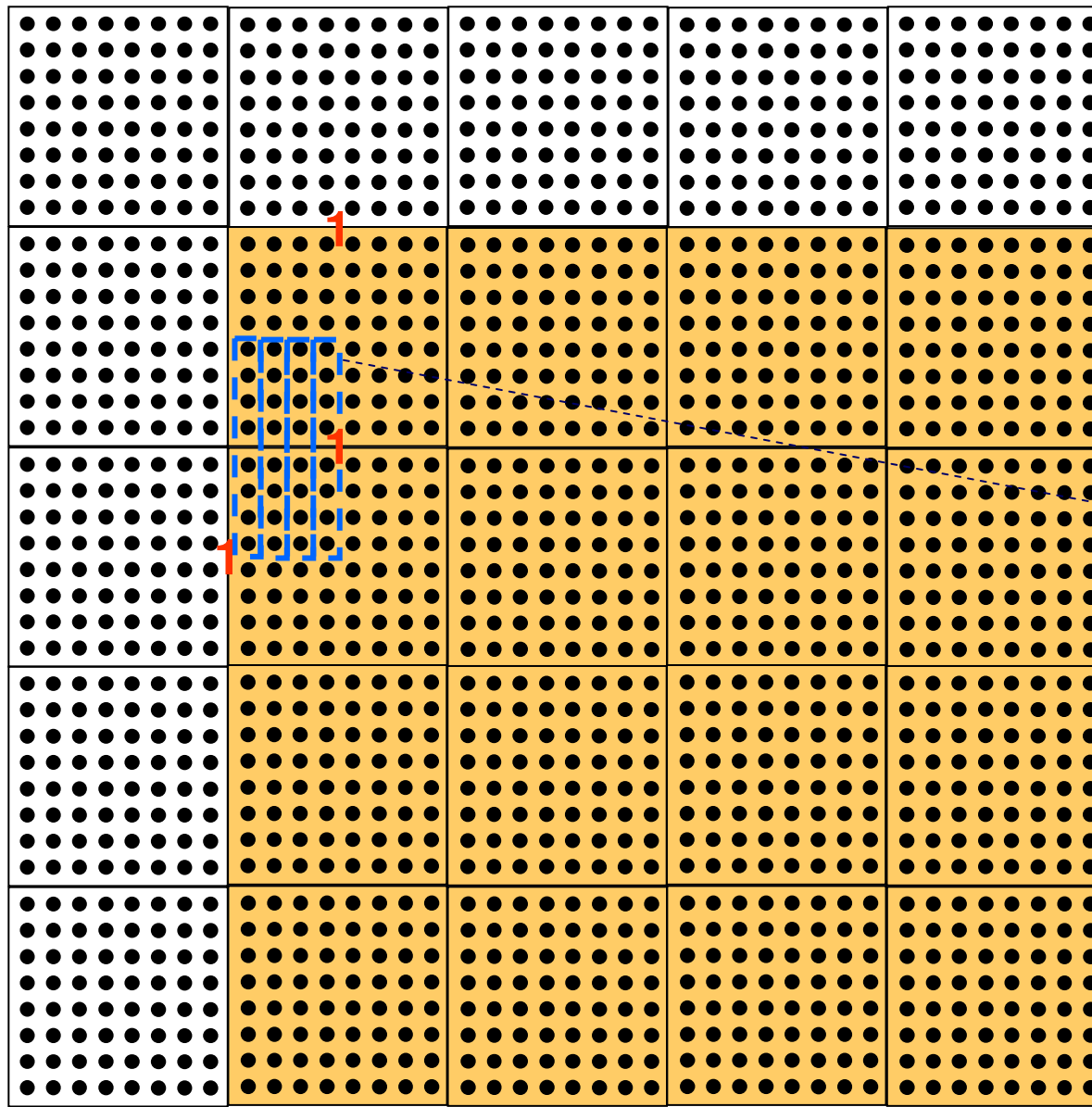


Compute decisions  
weak/strong filter and filter



# Proposed deblocking steps for a CU of size

40

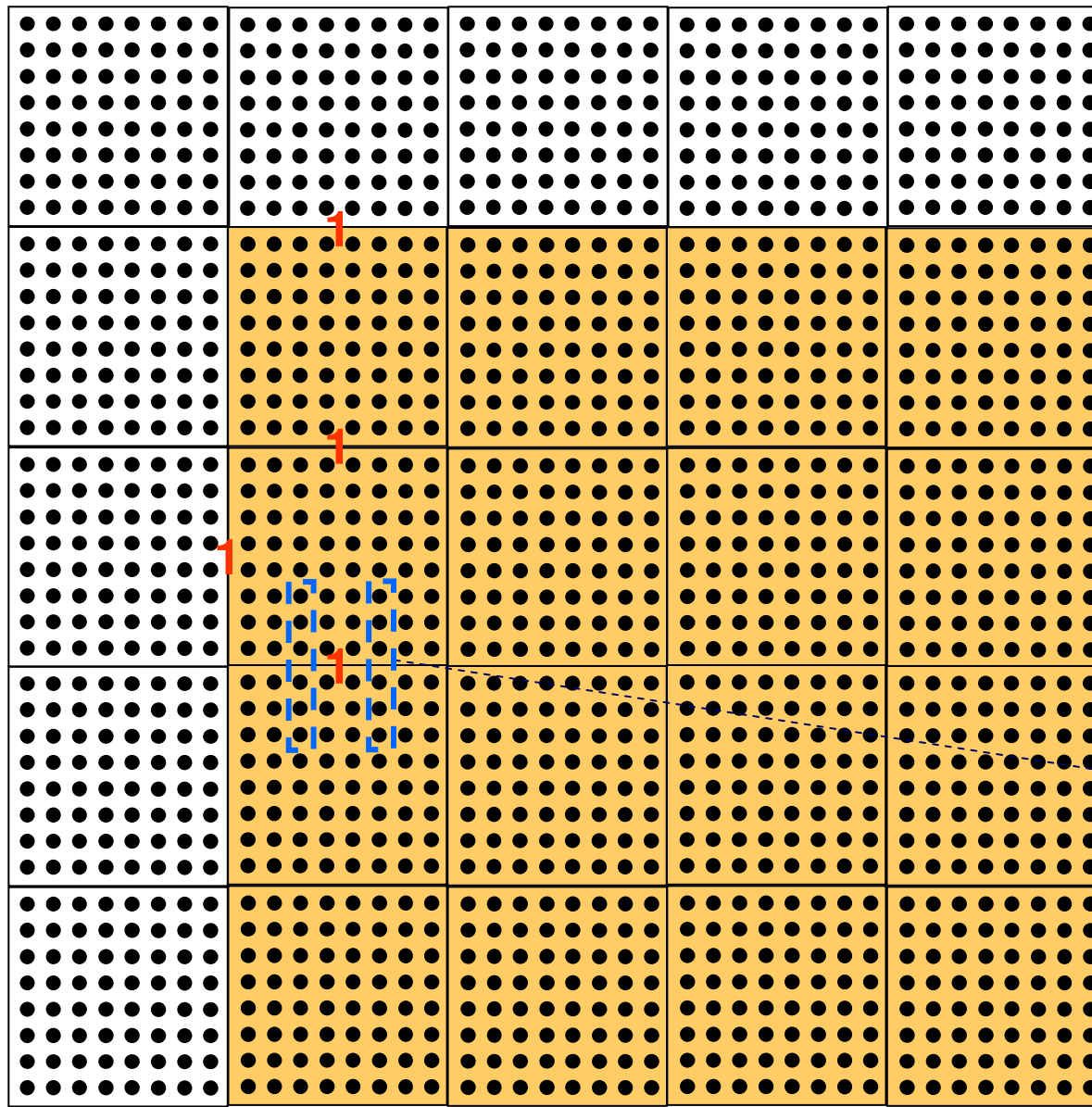


Retrieve decisions and filter



# Proposed deblocking steps for a CU of size

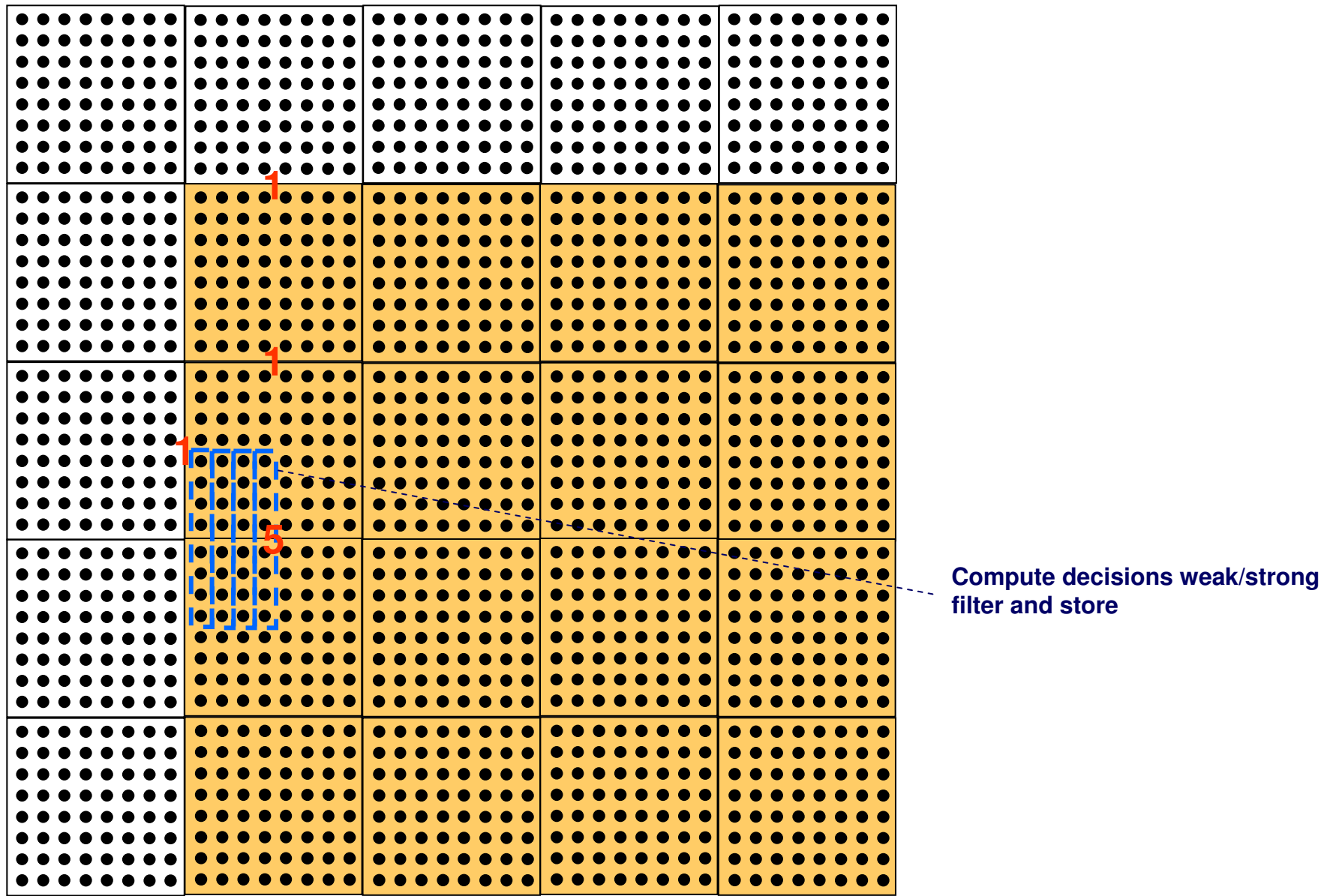
41



Compute decision filter  
on/off and store

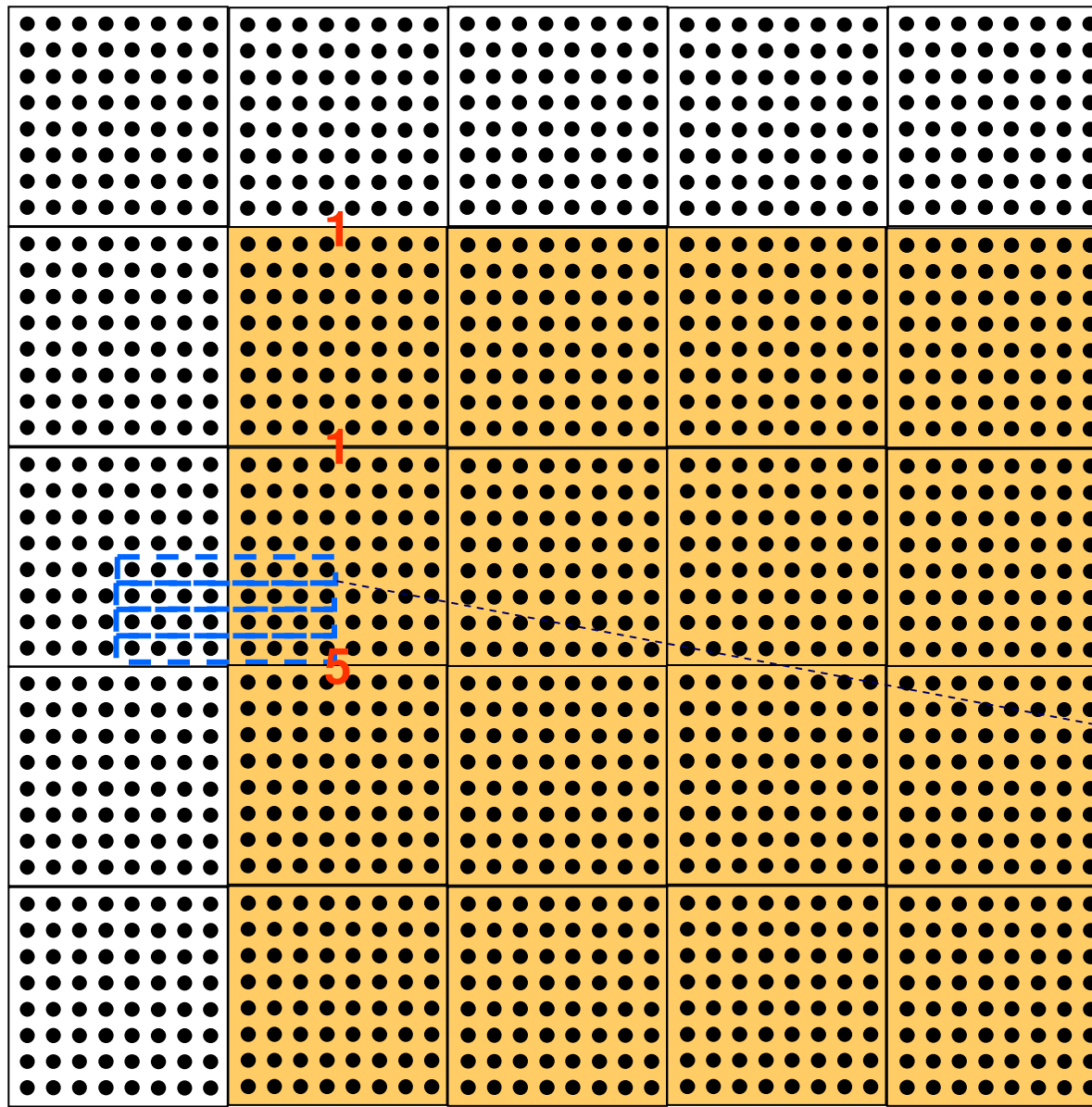
# Proposed deblocking steps for a CU of size

42



# Proposed deblocking steps for a CU of size

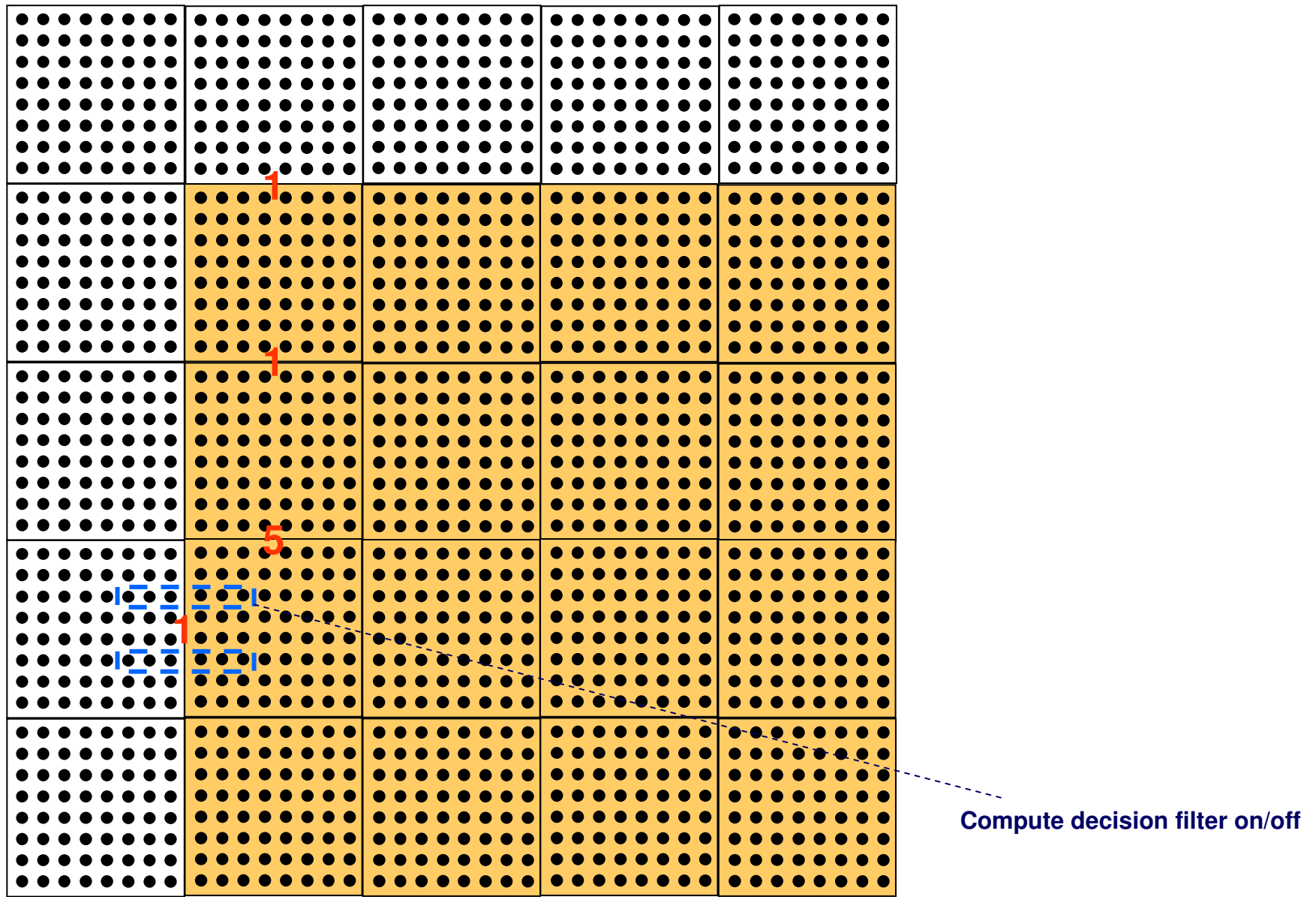
43



Compute decisions  
weak/strong filter and filter

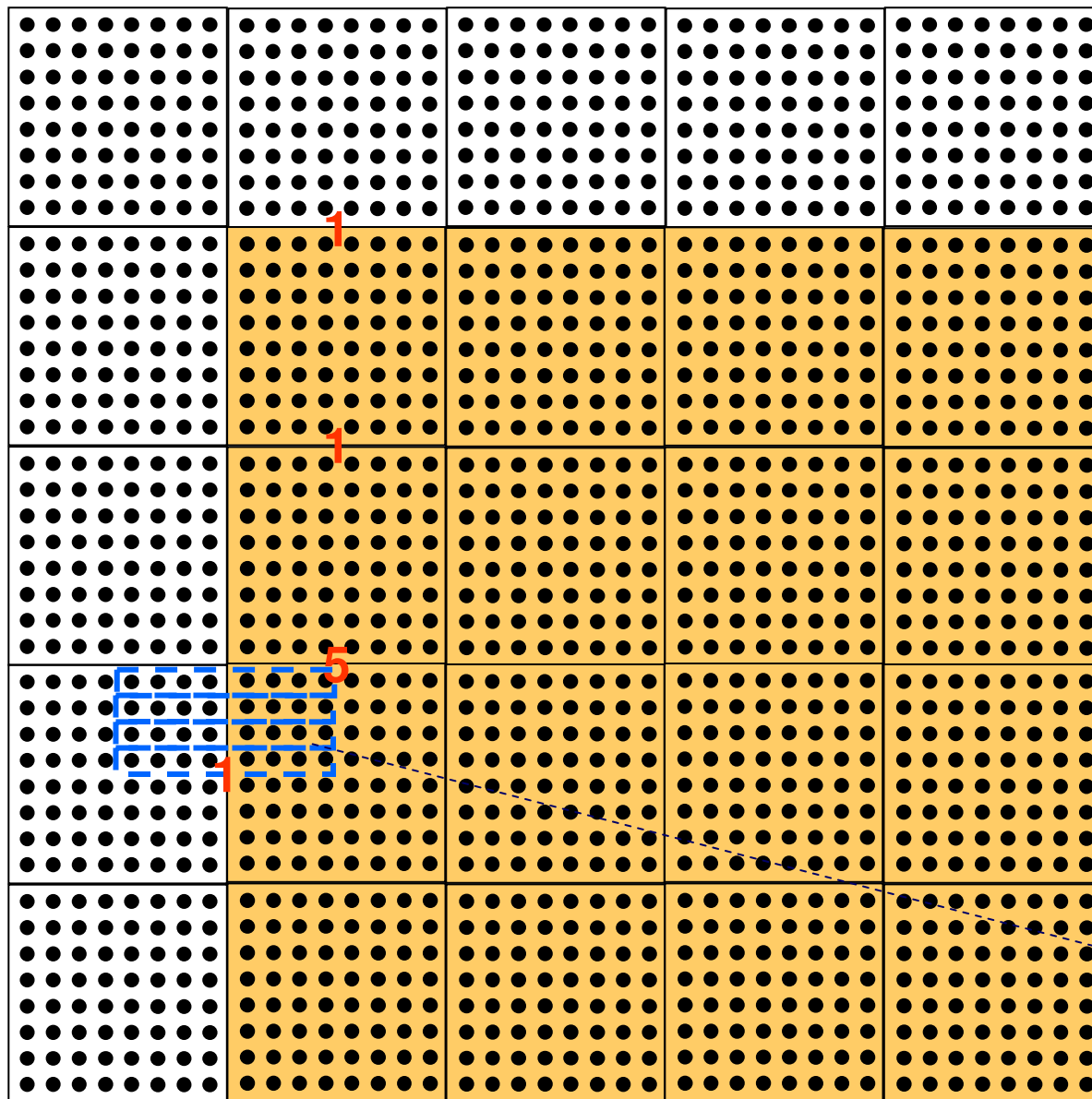
# Proposed deblocking steps for a CU of size

44



# Proposed deblocking steps for a CU of size

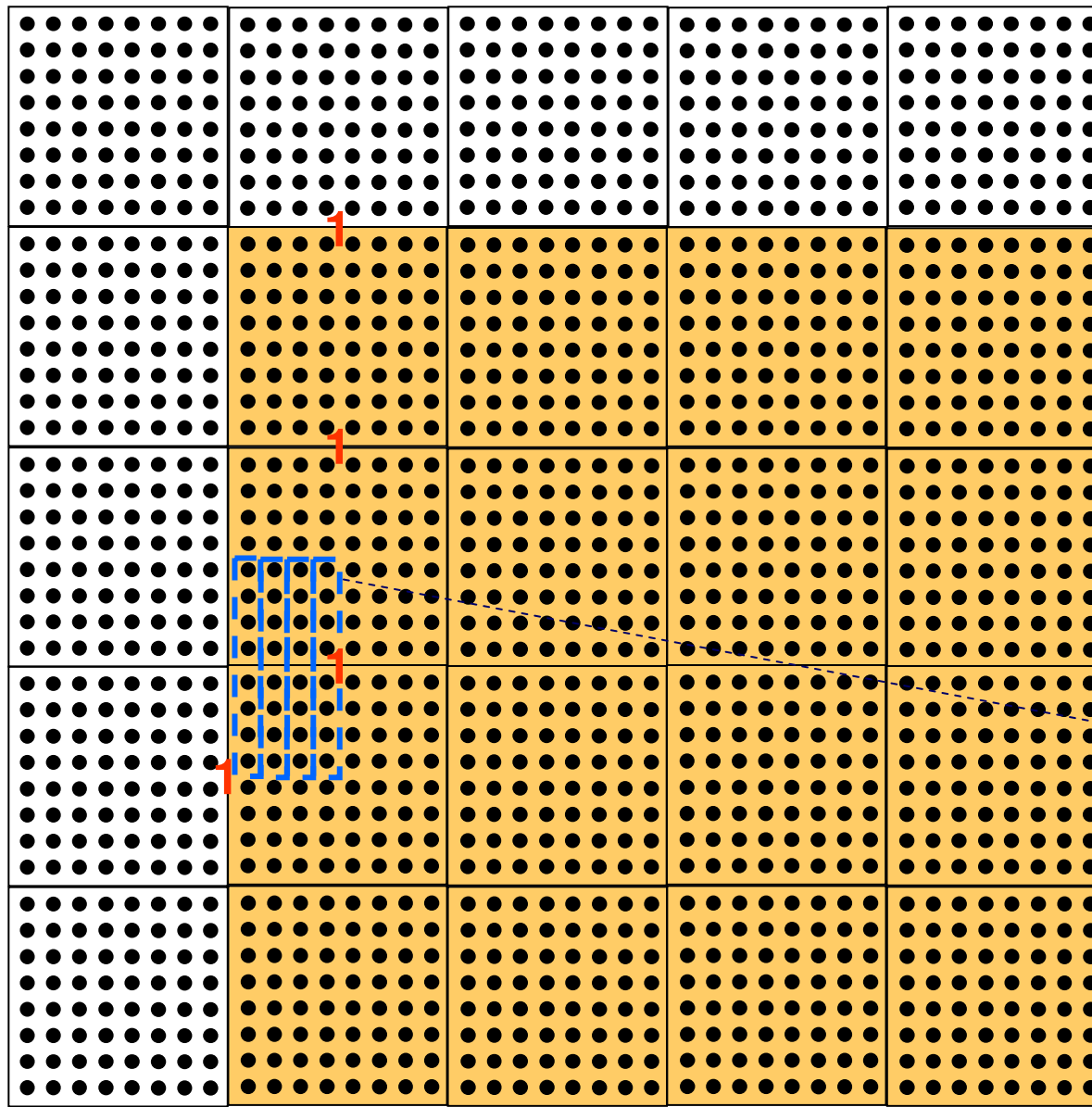
45



Compute decisions  
weak/strong filter and filter

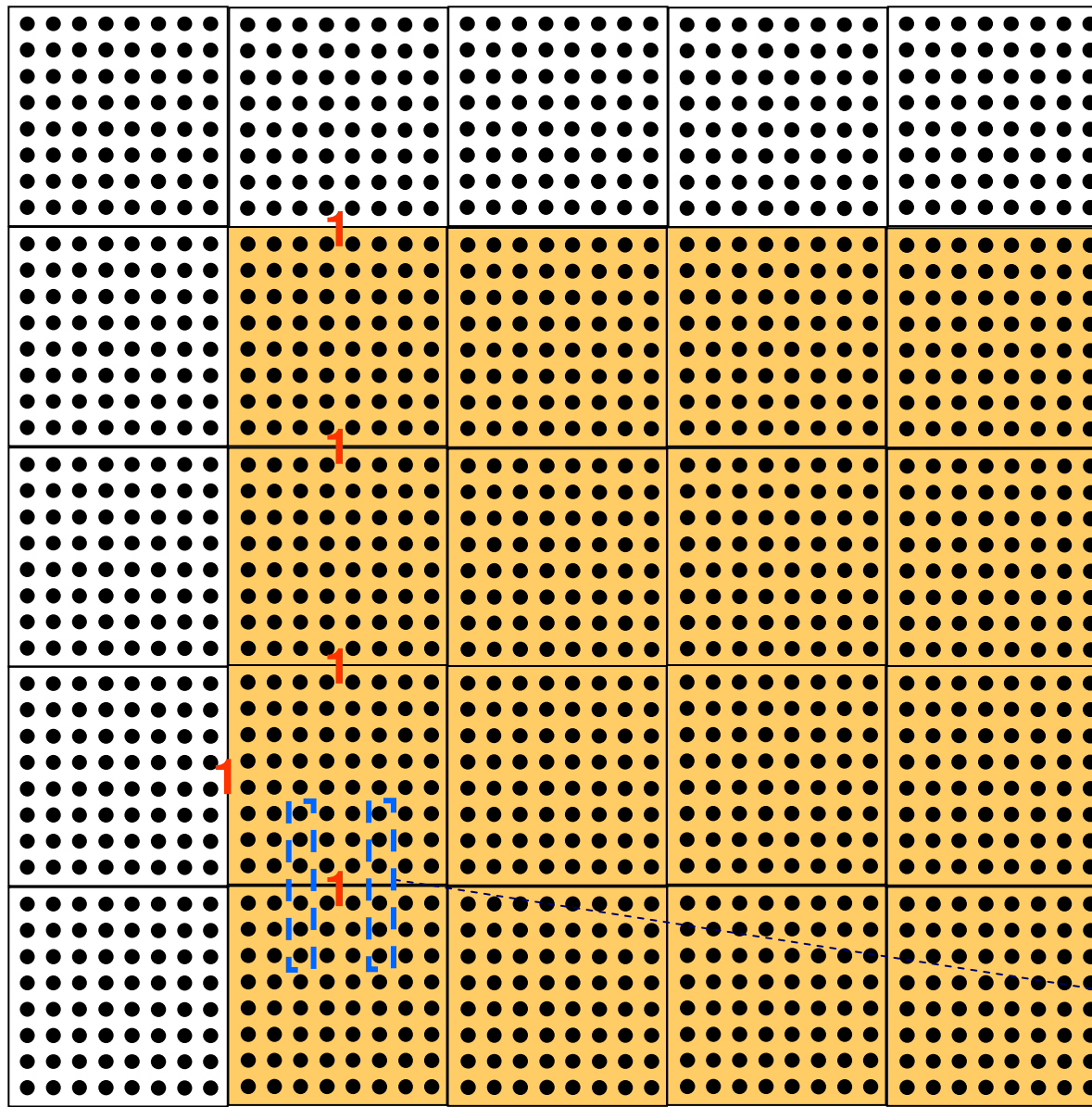
# Proposed deblocking steps for a CU of size

46



# Proposed deblocking steps for a CU of size

47

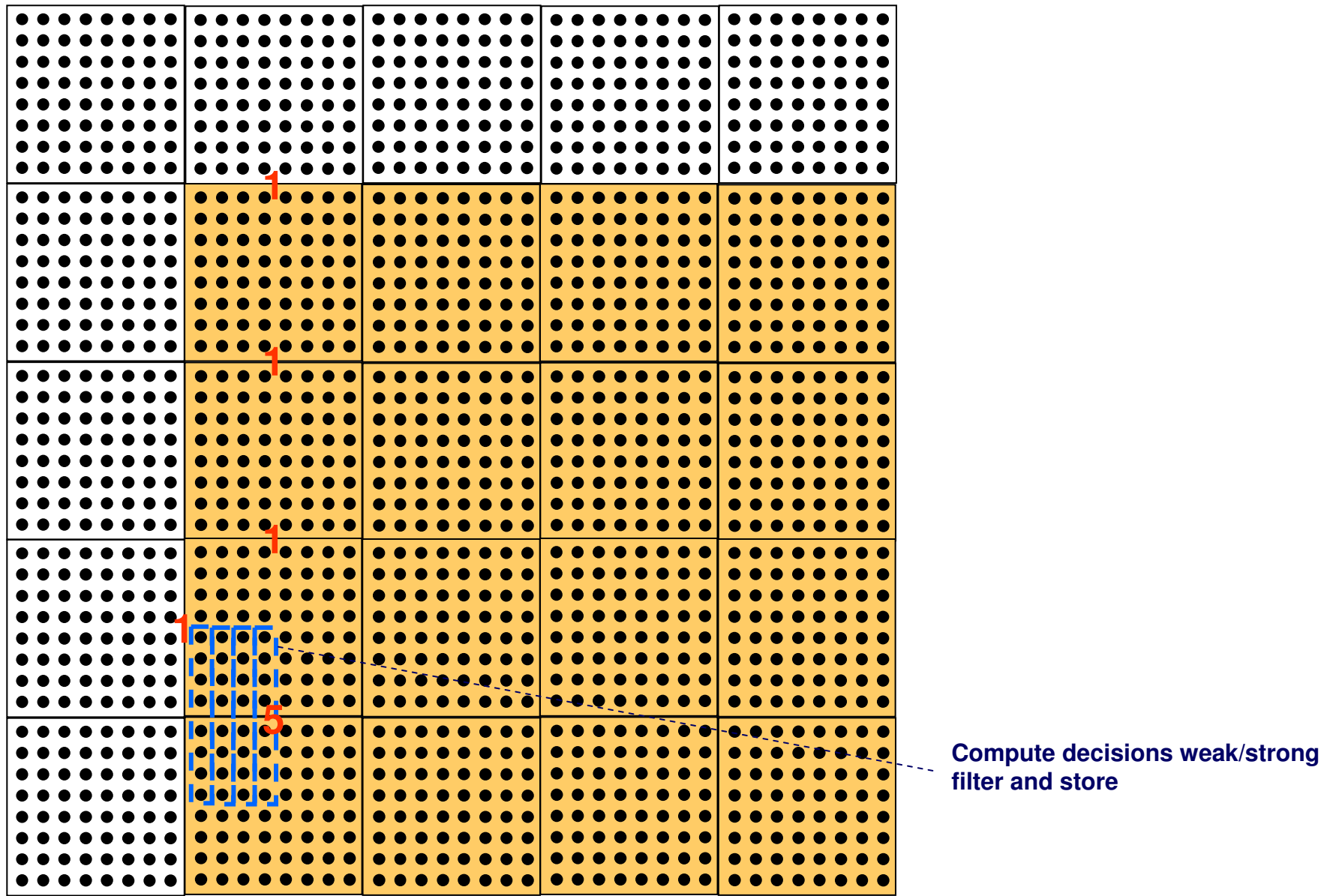


Compute decision filter  
on/off and store



# Proposed deblocking steps for a CU of size

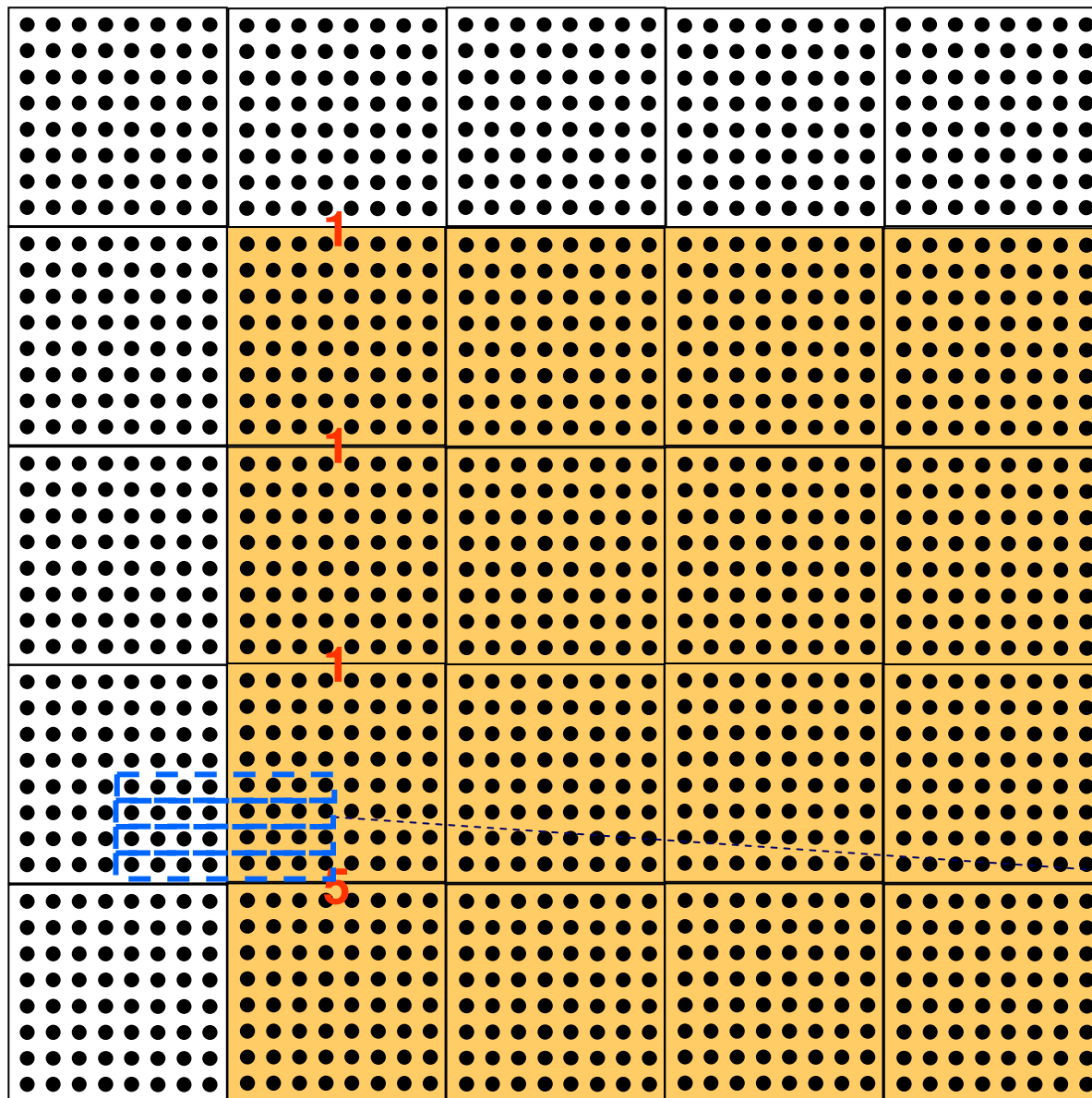
48





# Proposed deblocking steps for a CU of size

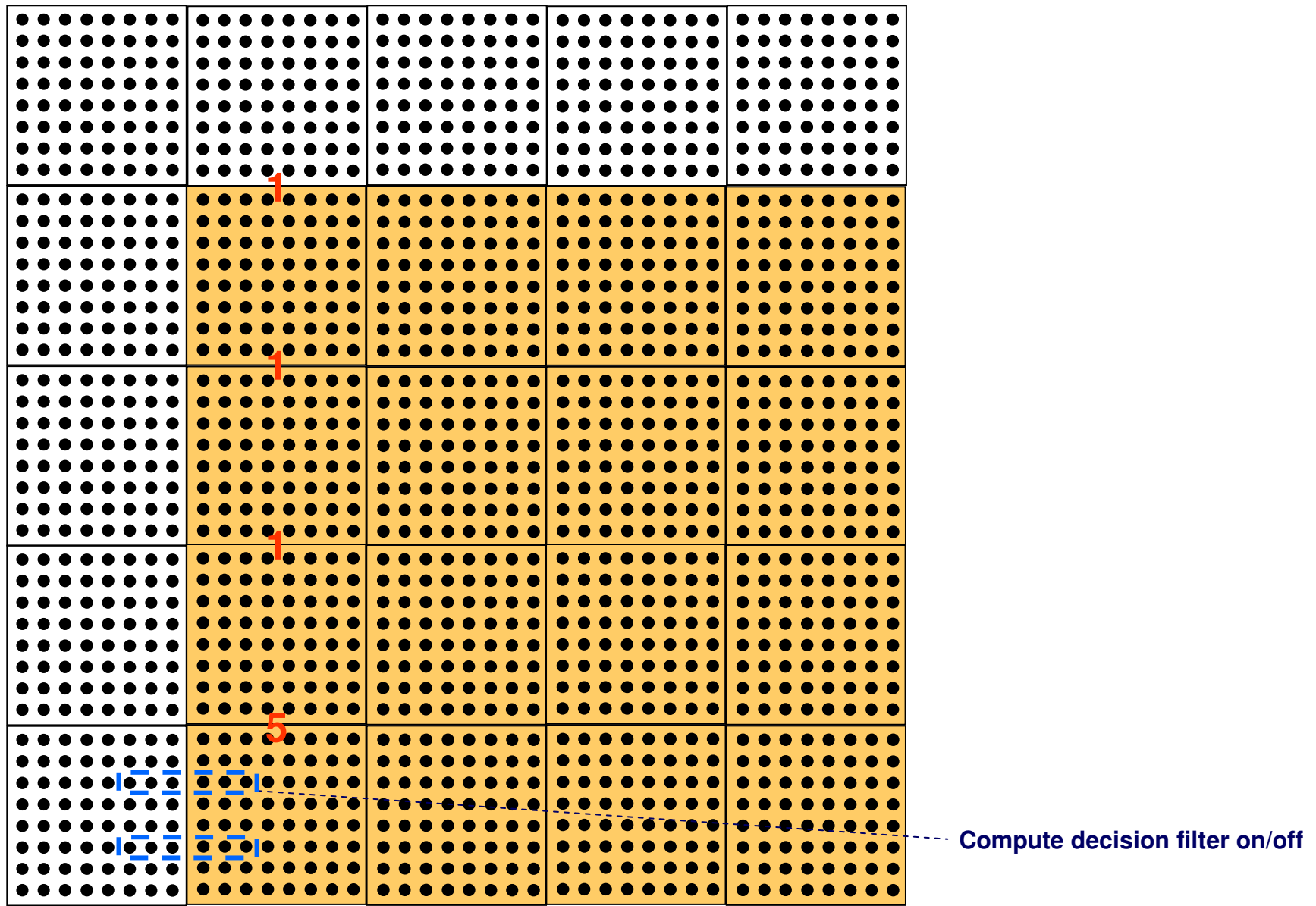
49



Compute decisions  
weak/strong filter and filter

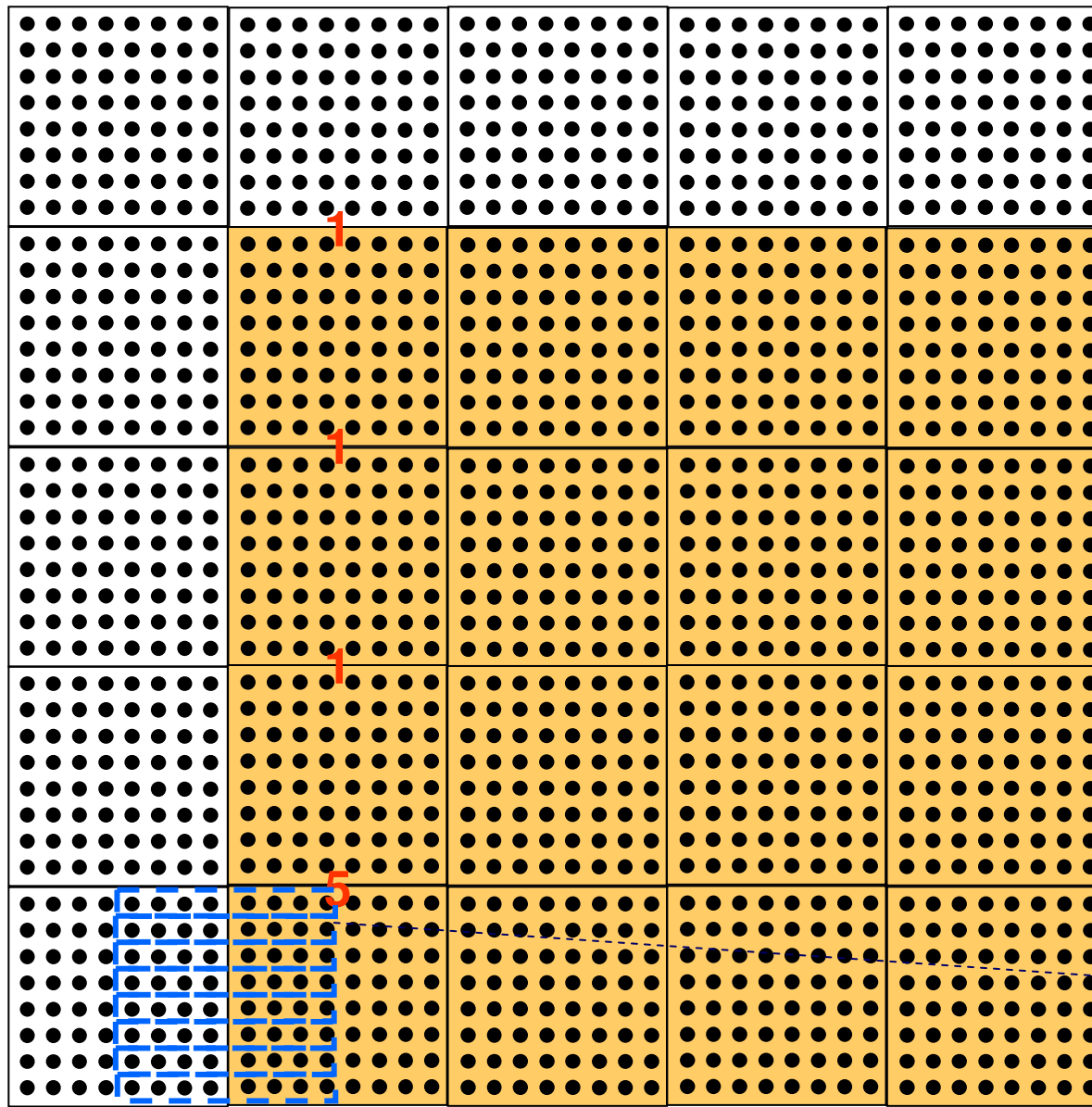
# Proposed deblocking steps for a CU of size

50



# Proposed deblocking steps for a CU of size

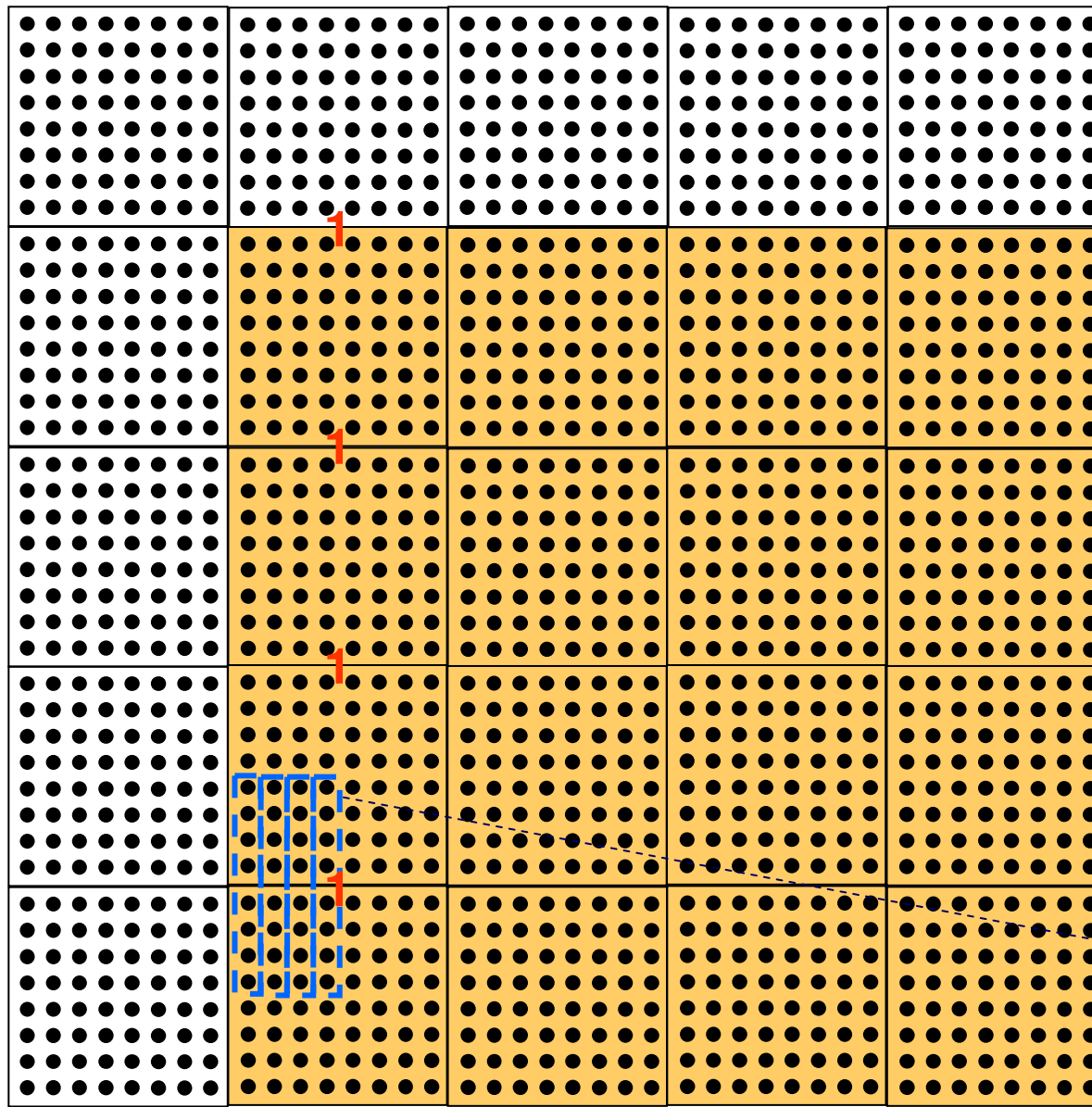
51



Compute decisions  
weak/strong filter and filter

# Proposed deblocking steps for a CU of size

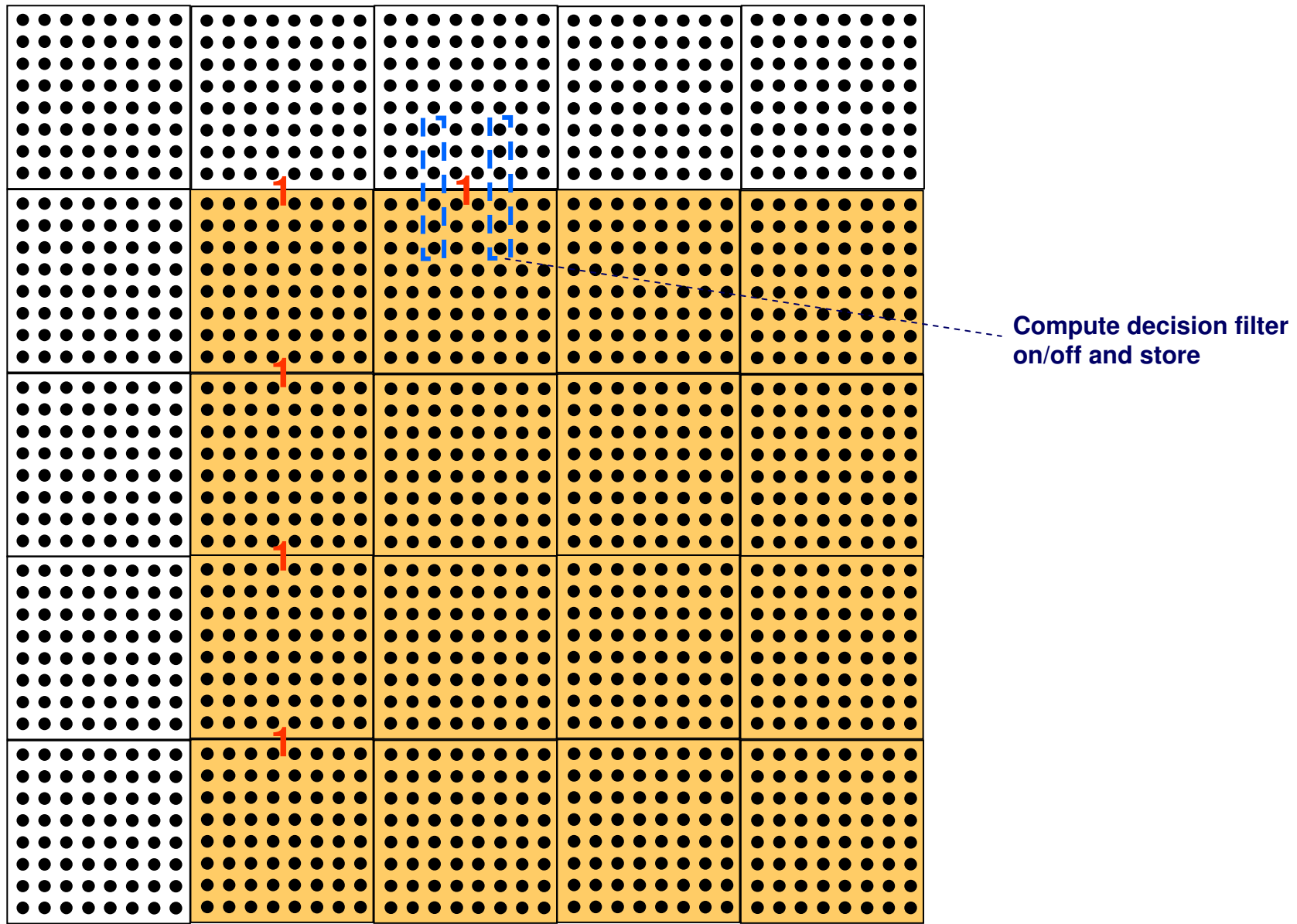
52



Retrieve decisions and filter

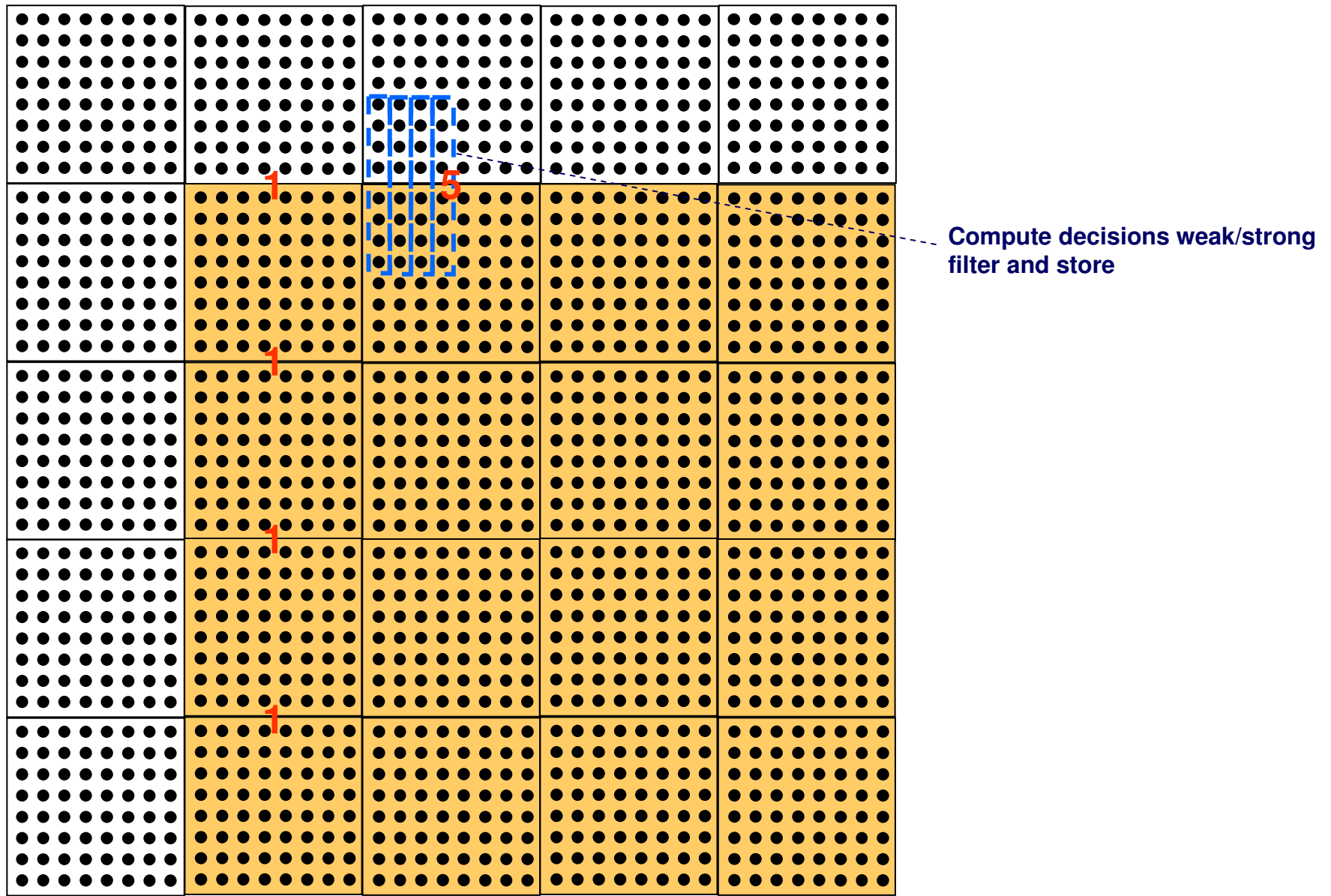
# Proposed deblocking steps for a CU of size

53



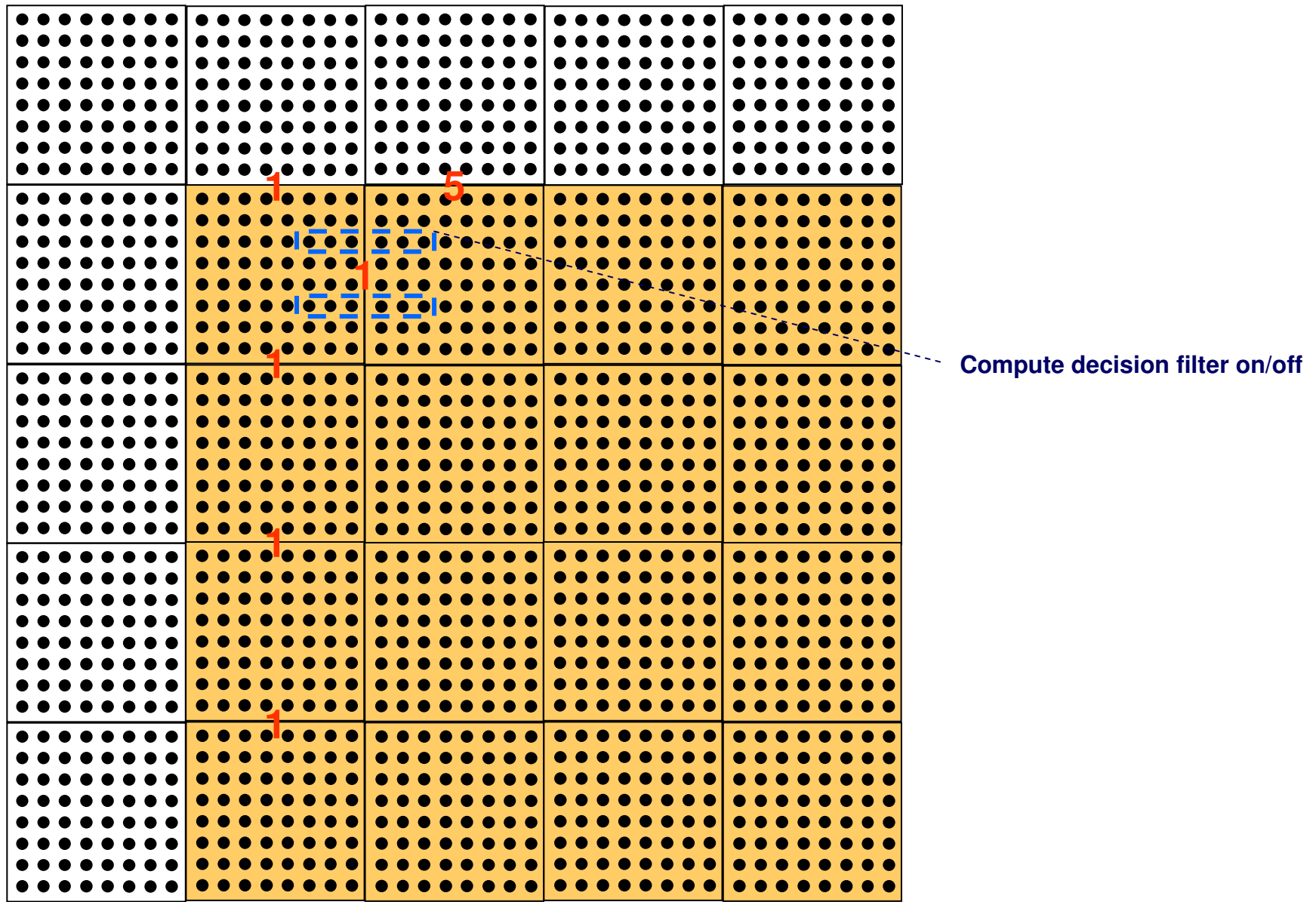
# Proposed deblocking steps for a CU of size

54



# Proposed deblocking steps for a CU of size

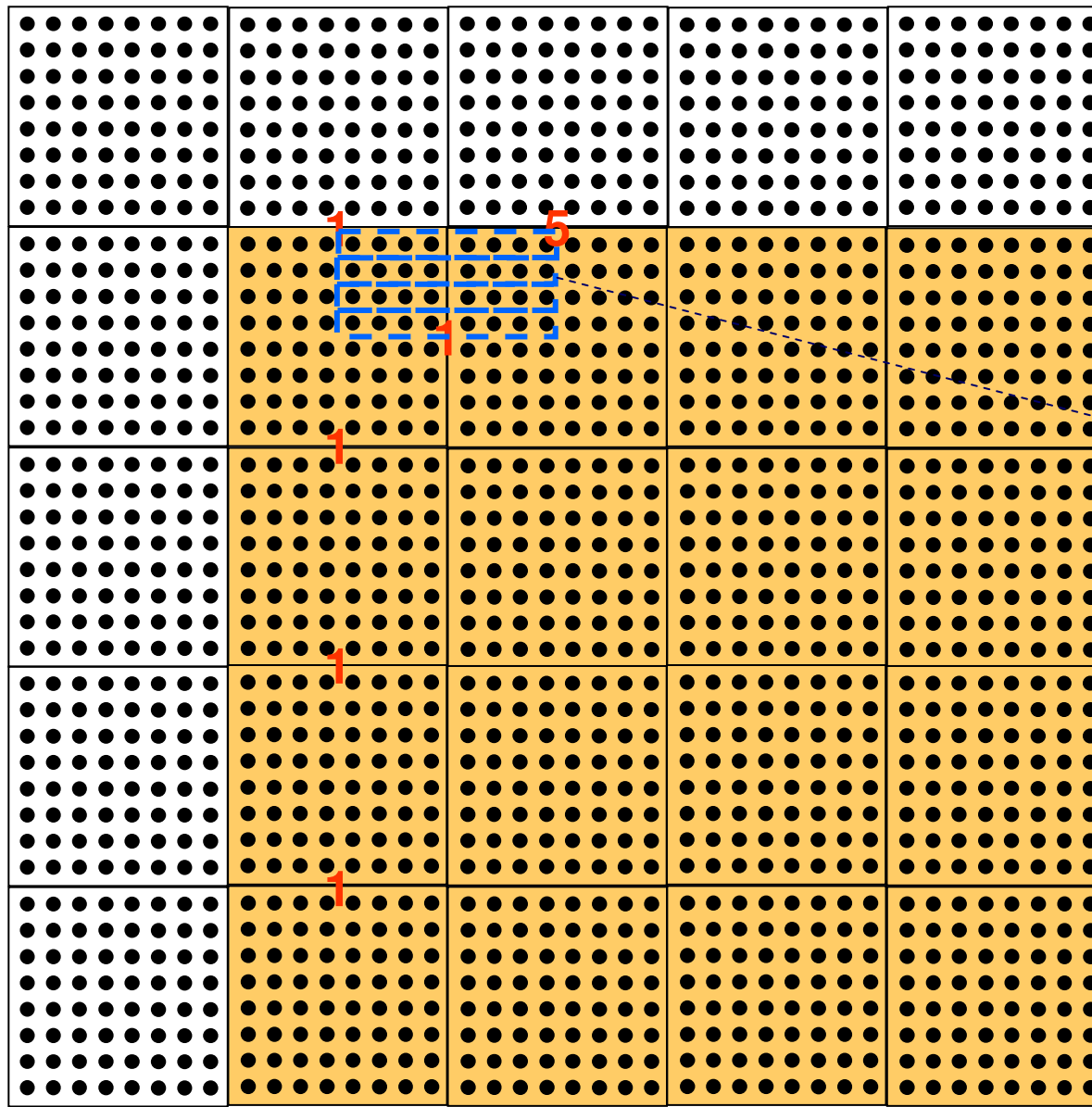
55





# Proposed deblocking steps for a CU of size

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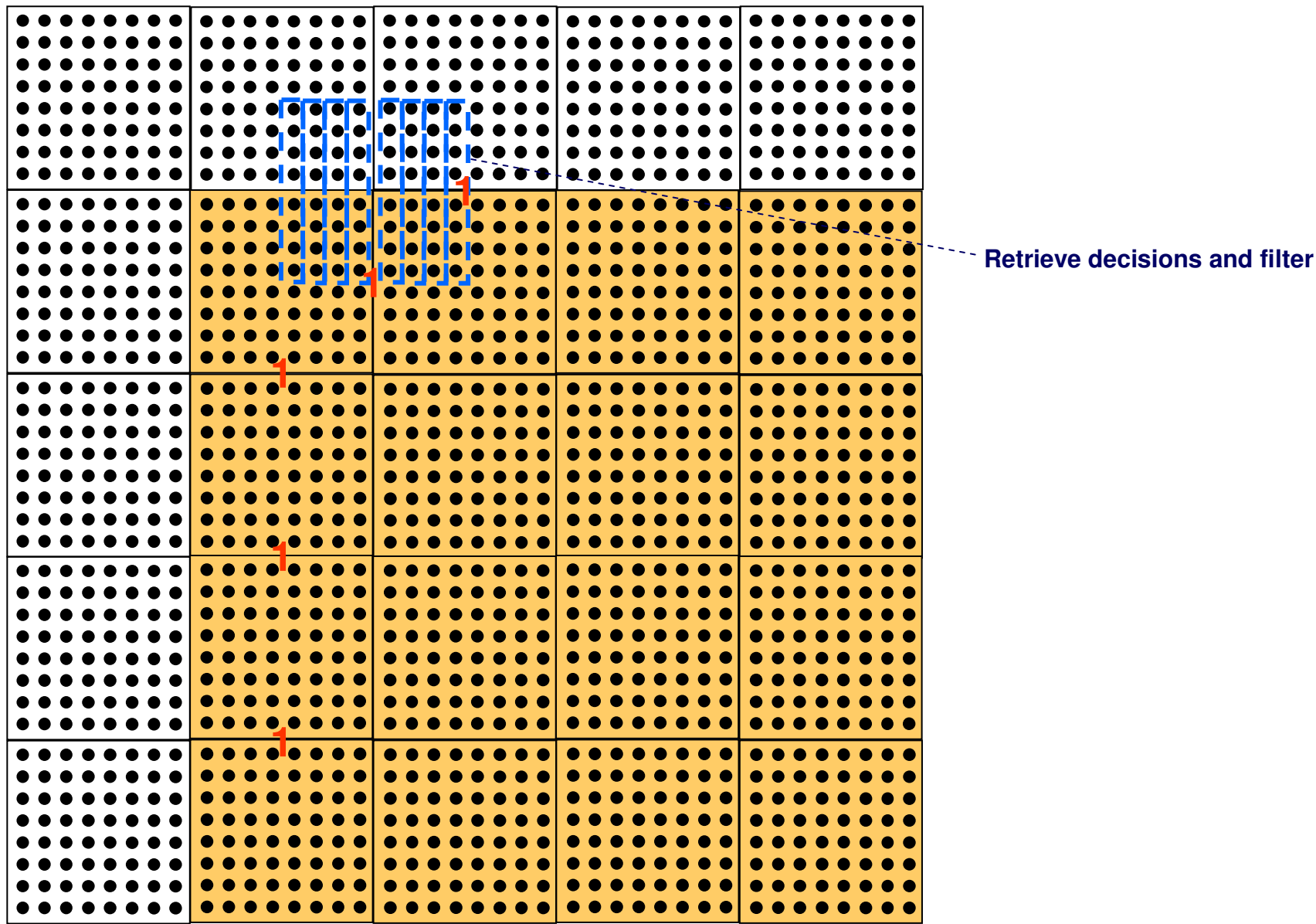


Compute decisions  
weak/strong filter and filter



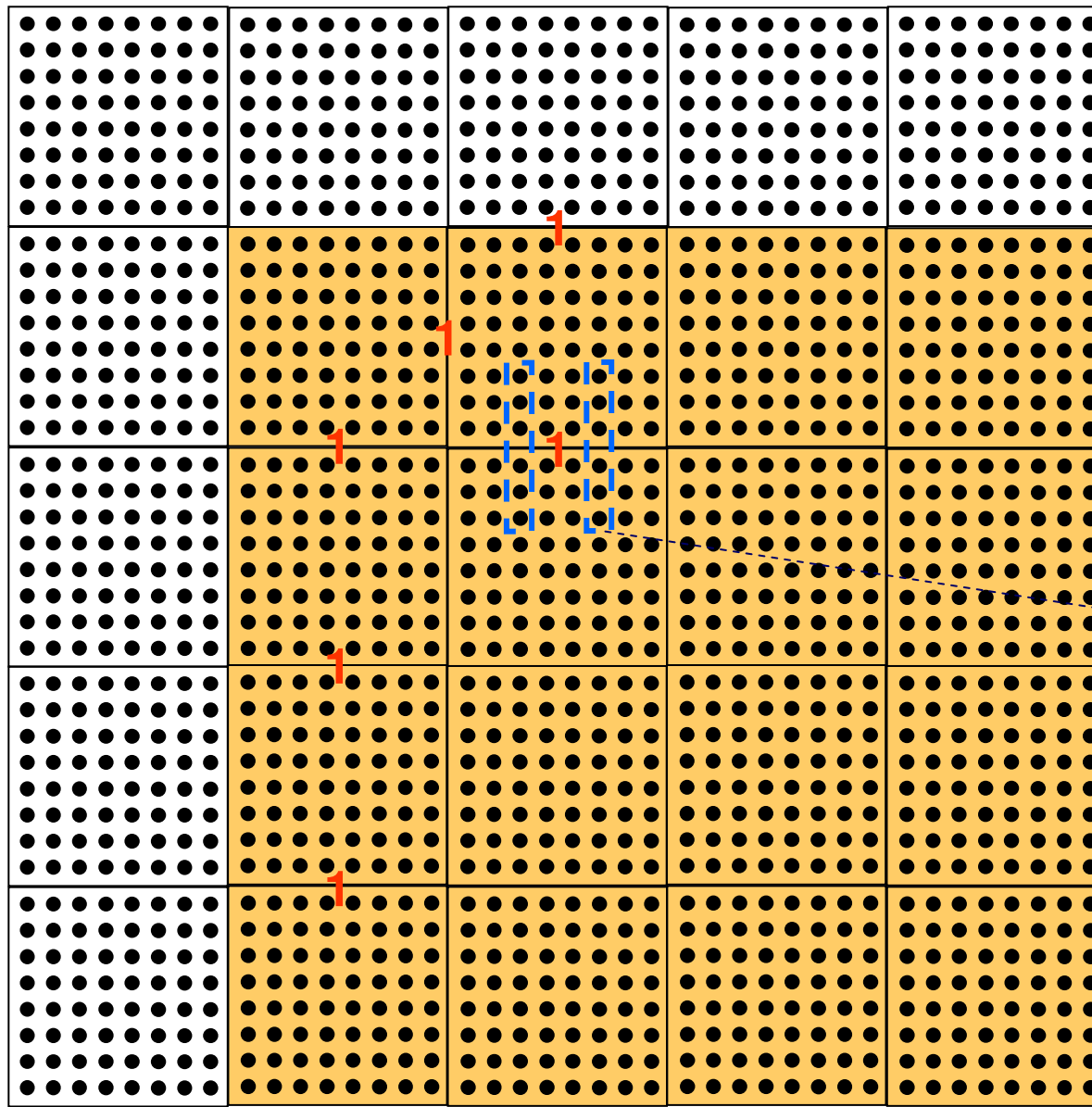
# Proposed deblocking steps for a CU of size

57



# Proposed deblocking steps for a CU of size

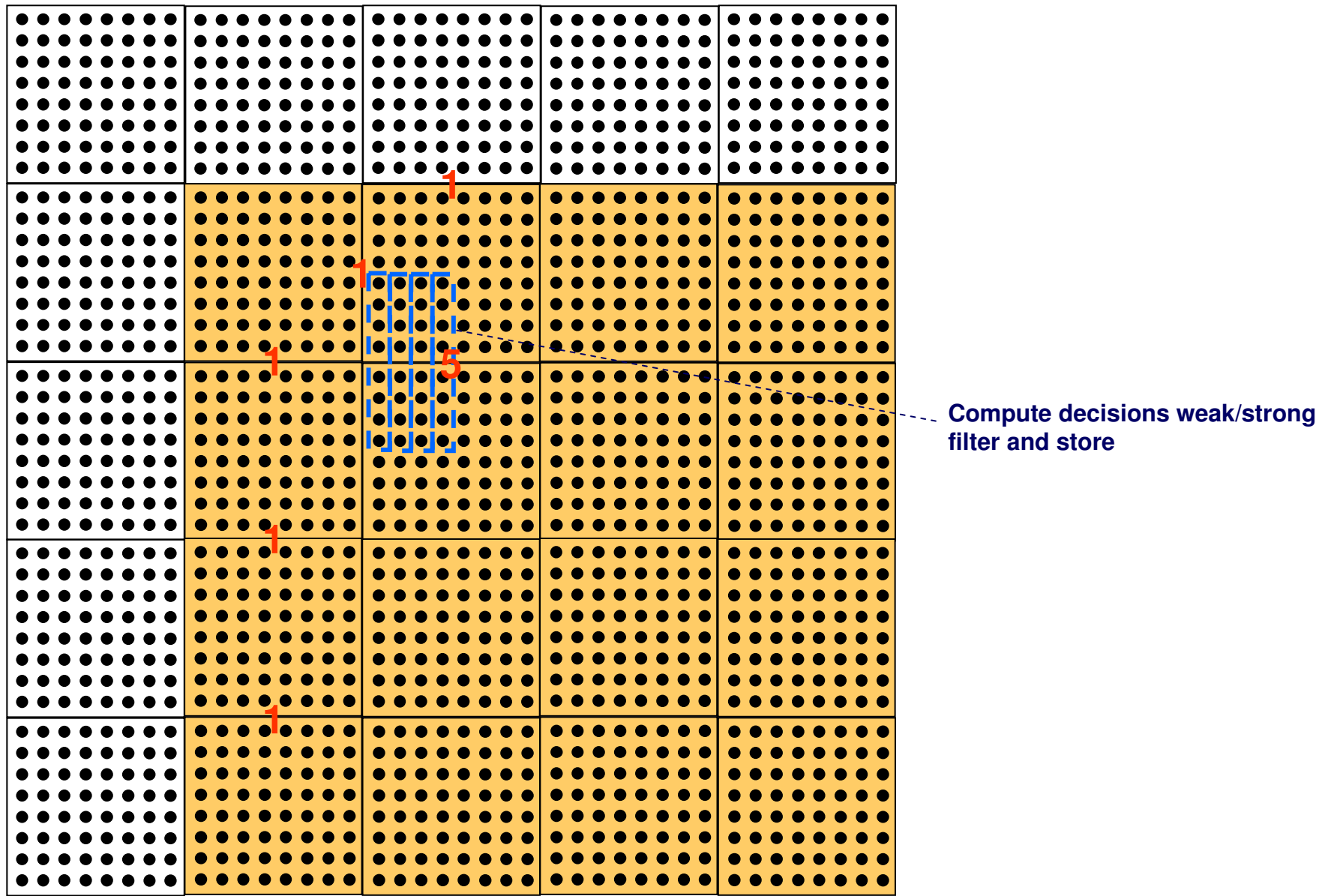
58



Compute decision filter  
on/off and store

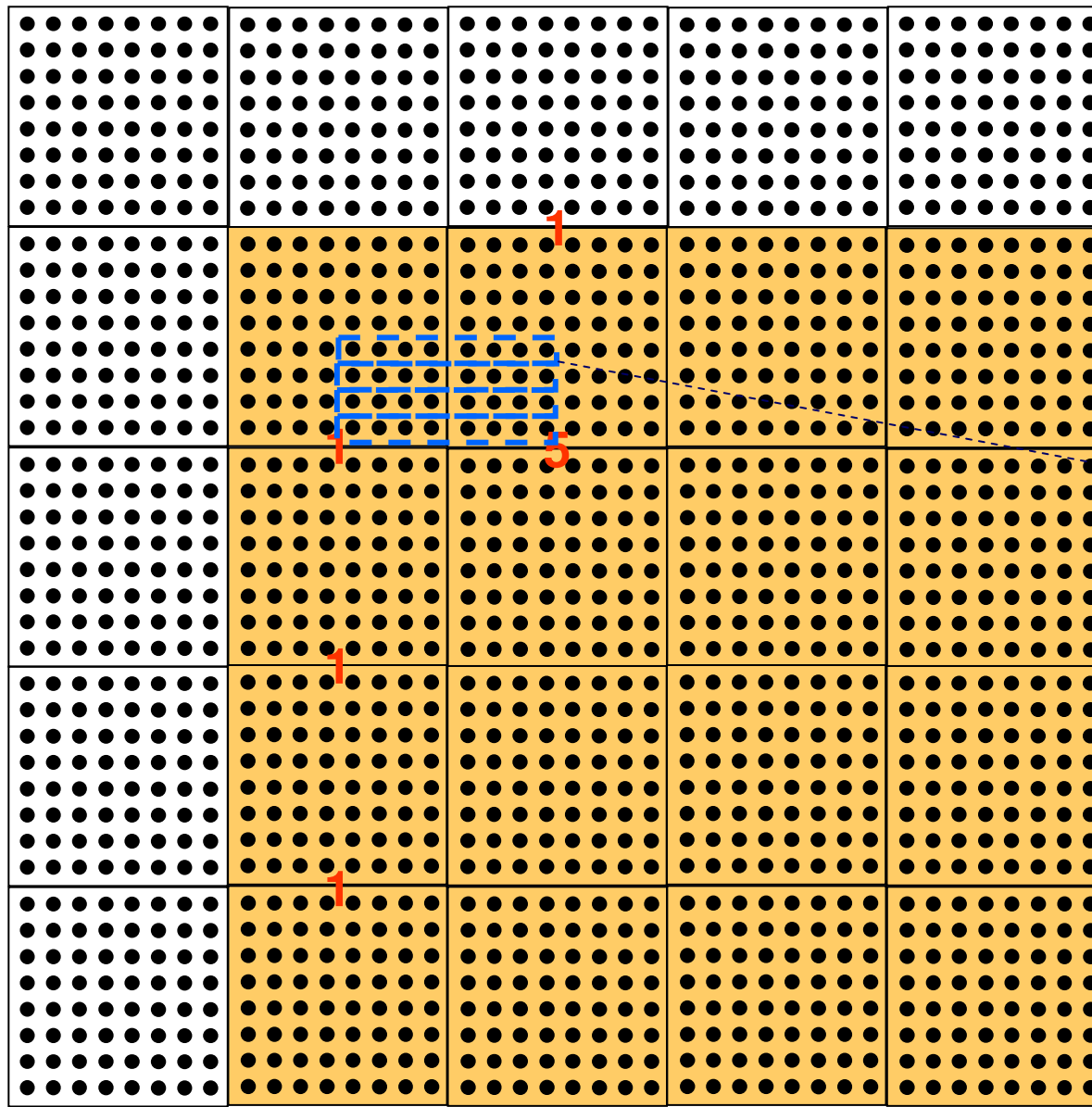
# Proposed deblocking steps for a CU of size

59



# Proposed deblocking steps for a CU of size

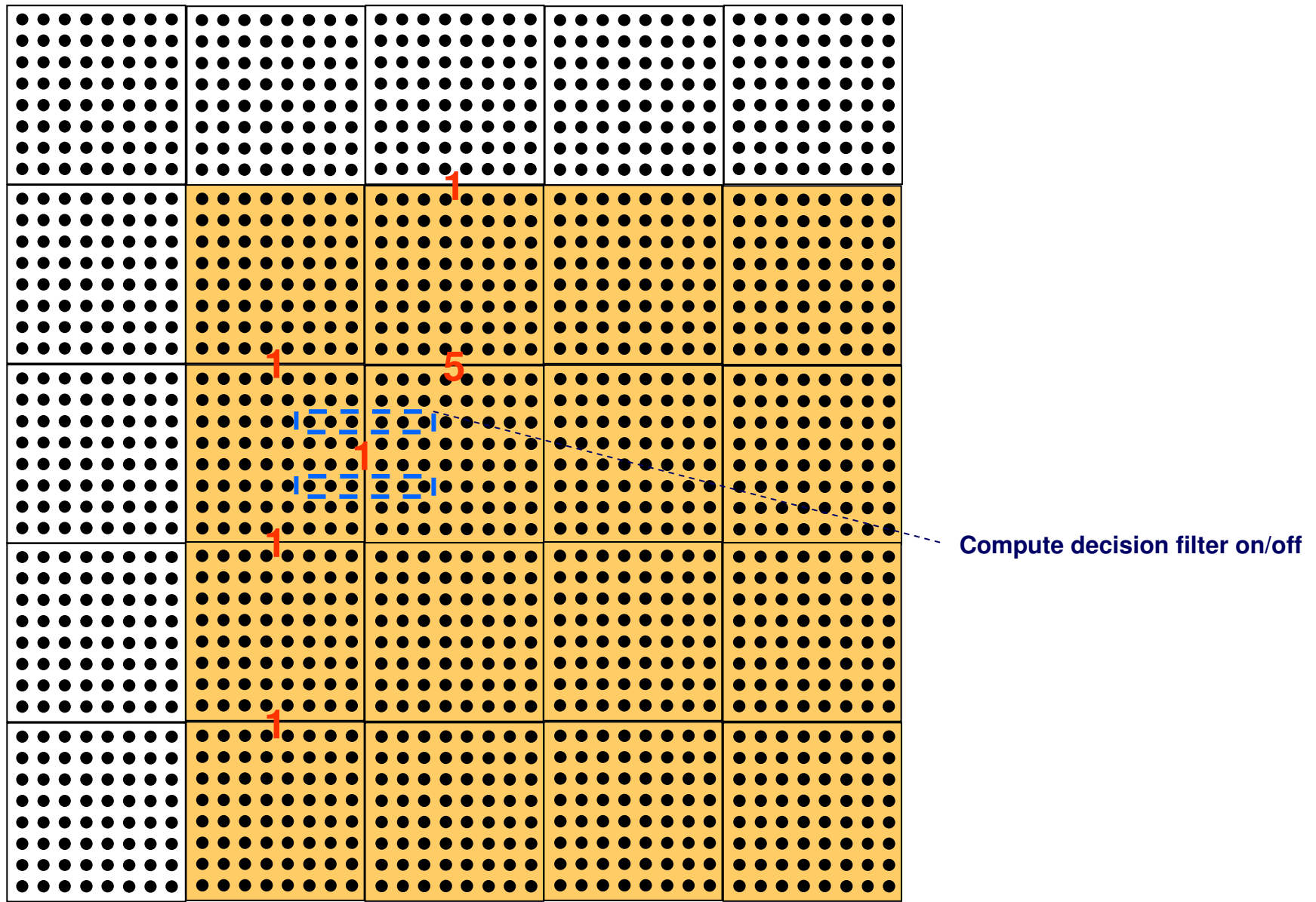
60



Compute decisions  
weak/strong filter and filter

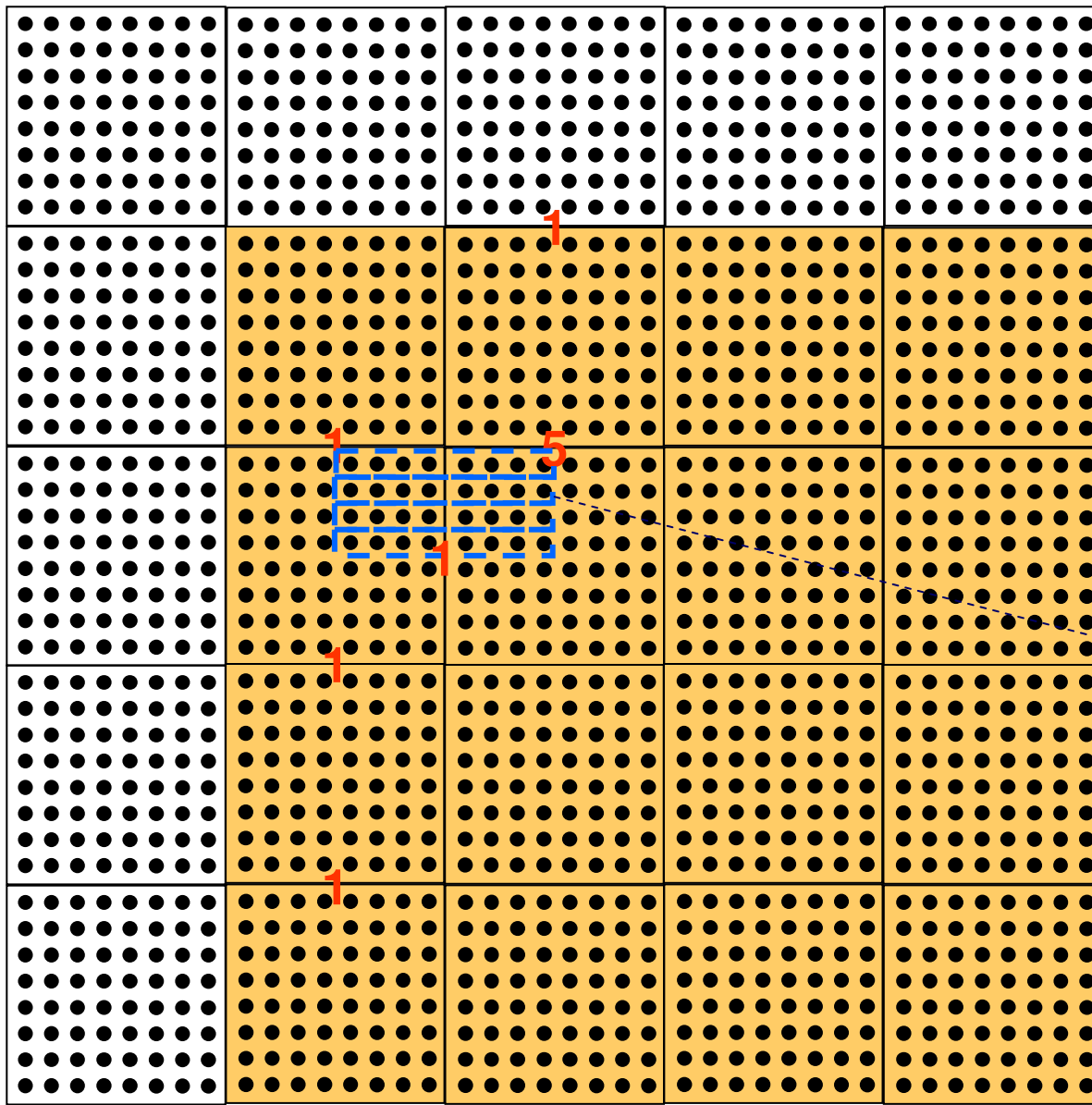
# Proposed deblocking steps for a CU of size

61



# Proposed deblocking steps for a CU of size

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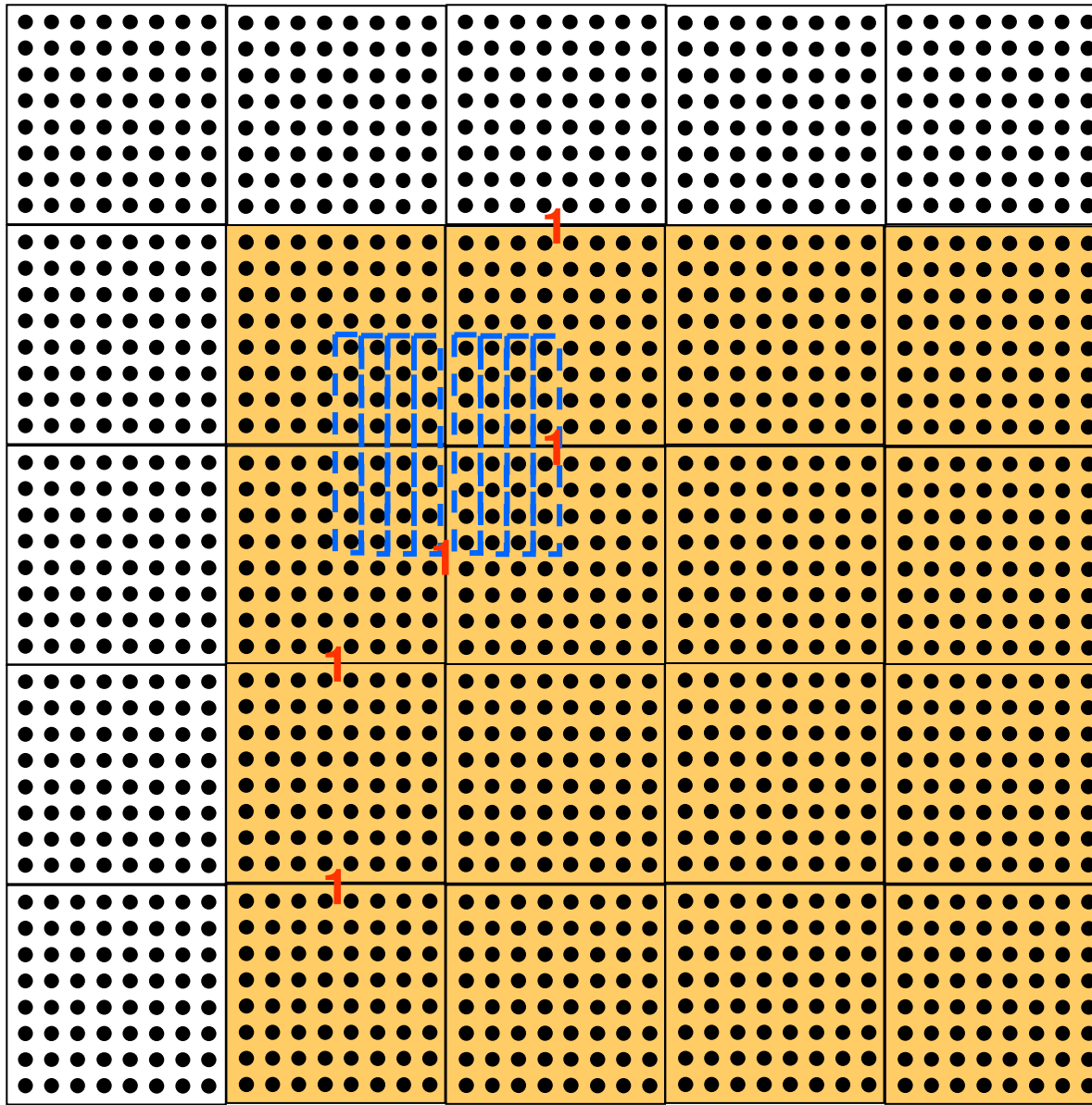


This shows worst case:  
10 bit

Compute decisions  
weak/strong filter and filter

## Proposed deblocking steps for a CU of size 63

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CU Size [samples x samples]	Additional memory to store decisions [bit]
8x8	5
16x16	8
32x32	10
64x64	14