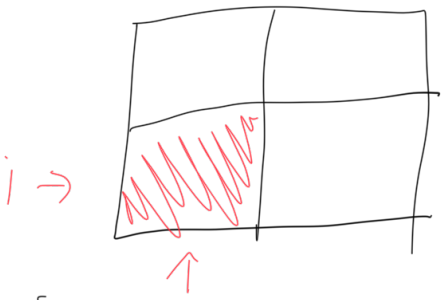
Homework 5

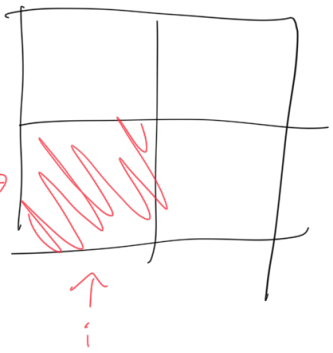
A N = 2



i = 1 j = 1

B

p = 2 ≤ q = 2



B(i, j) = A(j, i) ⇒

B(1, 1) = A(1, 1)

$1 \le i < p$ case1

$\vee$

$1 \le j < p$ case2

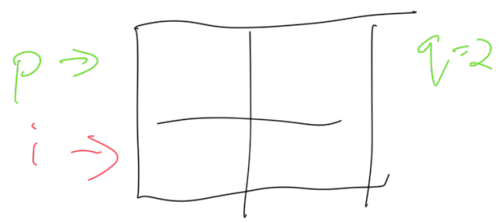
$\vee$

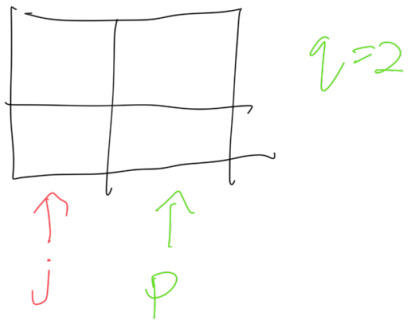
$q < i \le N$ case3

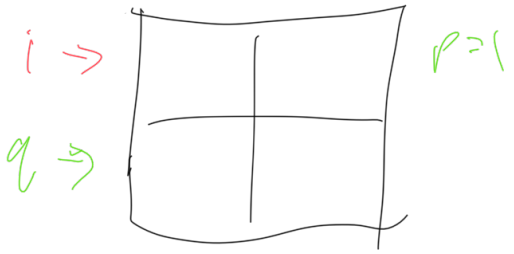
$\vee$

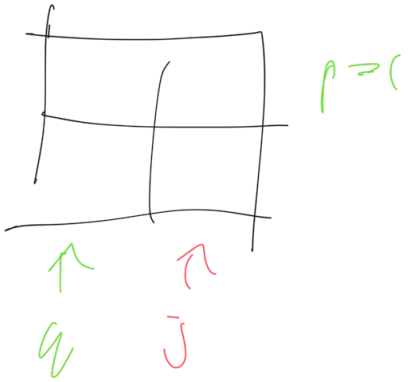
$q < j \le$ case4

$N \ge 2$



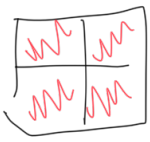






Cases for p, q

$p, q \in \{0, 1, 2, 3\}$



$p = 0 \quad q = 0$

$i = 1, \; j = 1$

$q < i \Rightarrow B(1,1) = A(1,1)$

$i = 1 \quad j = 2$

$q < i \Rightarrow B(1,2) = A(2,1)$

$i = 2 \quad j = 1$

$q < i \Rightarrow B(2,1) = A(1,2)$

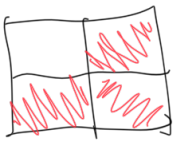
$i = 2 \quad j = 2$

$q < i \Rightarrow B(2,2) = A(2,2)$

✓

transposed

$p = 1 \quad q = 1$



$i = 1 \quad j = 1$

$(i \not< p) \wedge (j \not< p) \wedge (q \not< i) \wedge (q \not< j)$

$i = 1 \quad j = 2$

$q < j \Rightarrow B(1,2) = A(2,1)$

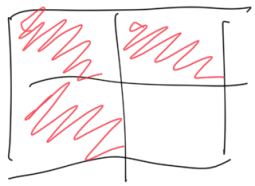
$i = 2 \quad j = 1$

$q < i \Rightarrow B(2,1) = A(1,2)$

$i = 2 \quad j = 2$

$q < i \Rightarrow B(2,2) = A(2,2)$

$p=2 \quad q=2$



$i=1 \quad j=1$

$i<p \Rightarrow B(1,1) = A(1,1)$

$i=1 \quad j=2$

$i<p \Rightarrow B(1,2) = A(2,1)$

$i=2 \quad j=1$

$j<p \Rightarrow B(2,1) = A(1,2)$

$i=2 \quad j=2$

$(i \not< p) \wedge (j \not< p) \wedge (q \not< i) \wedge (q \not< j)$

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other cases: $p=0, q=1$ $p=1, q=2$ $p=2, q=3$, $p=3, q=3$

if for $p=0, q=0$, the entire matrix is transposed, other values don't really matter, all elements in matrix must be transposed at initialization [then we don't need any assignment statements.