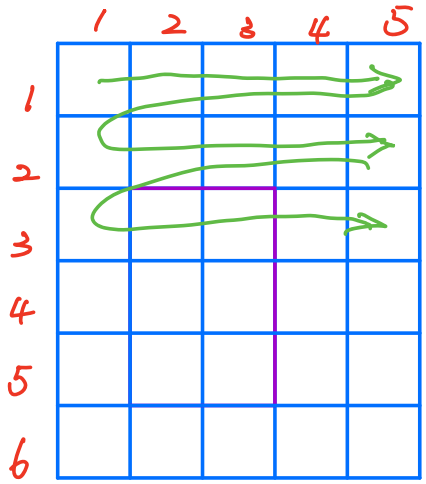
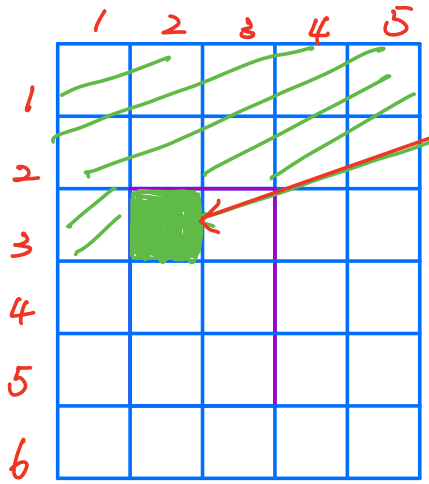


S[i.j] how to calculate

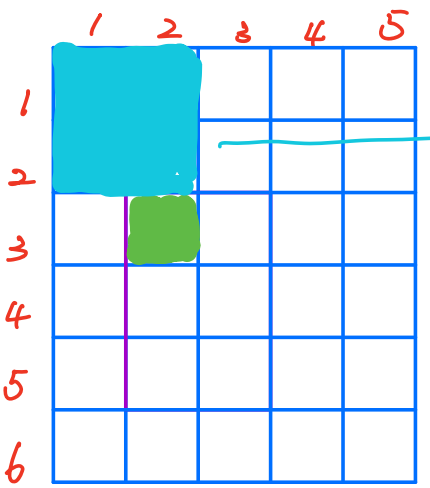
$s[i,j] = s[i-1,j] + s[i,j-1] - s[i-1,j-1] + a[i,j]$

S order

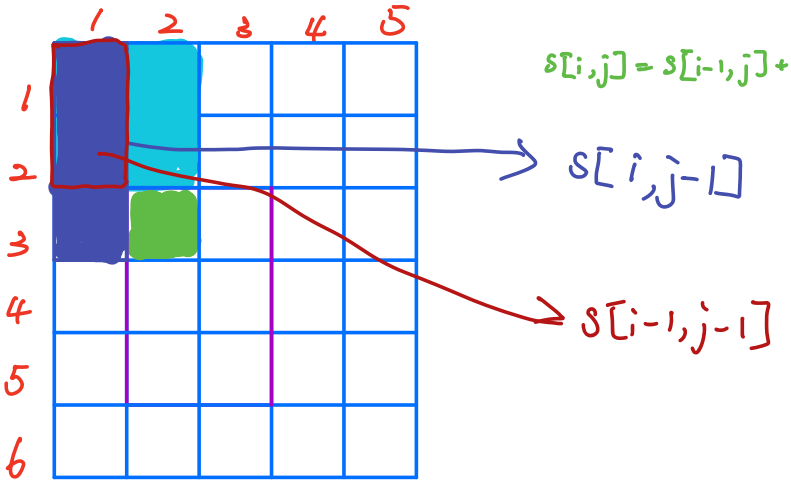


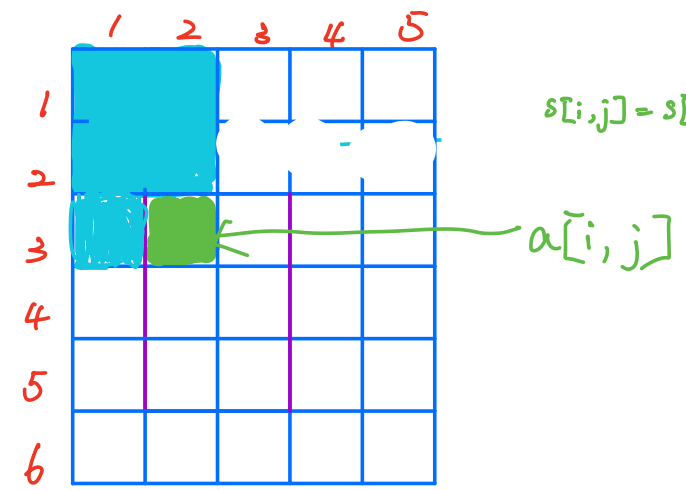
S[i,j] is already the sum of all the highlights cell

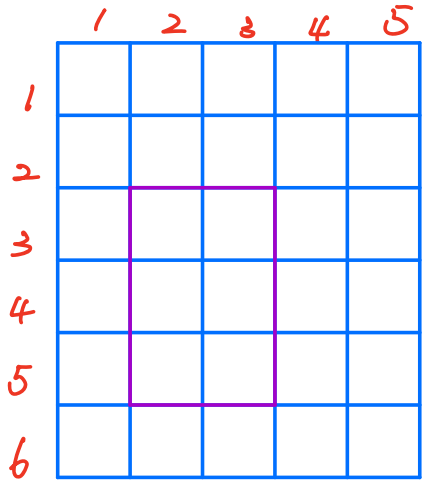
$s[i,j] = s[i-1,j] + s[i,j-1] - s[i-1,j-1] + a[i,j]$



S[i-1,j]


1 2 3 4 5
1
2
3
4
5
6
s[i,j] = s[i-1,j] + s[i,j-1] - s[i-1,j-1] + a[i,j]
s[i,j-1]
s[i-1,j-1]


1 2 3 4 5
1
2
3
4
5
6
s[i,j] = s[i-1,j] + s[i,j-1] - s[i-1,j-1] + a[i,j]
a[i,j]

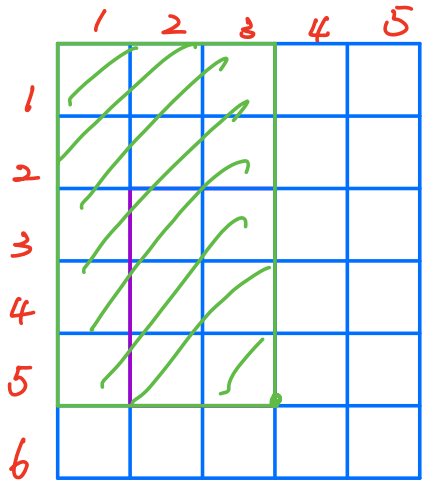


How to calculate $(x_1, y_1), (x_2, y_2)$ sum

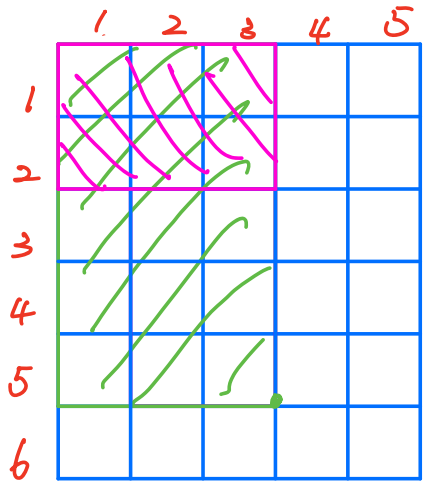
$S[x_2, y_2] - S[x_1 - 1, y_2] - S[x_2, y_1 - 1] + S[x_1 - 1, y_1 - 1]$

In the example $x_1 = 3, y_1 = 2$

$x_2 = 5, y_2 = 3$



$S[x_2, y_2] = S[5, 3]$

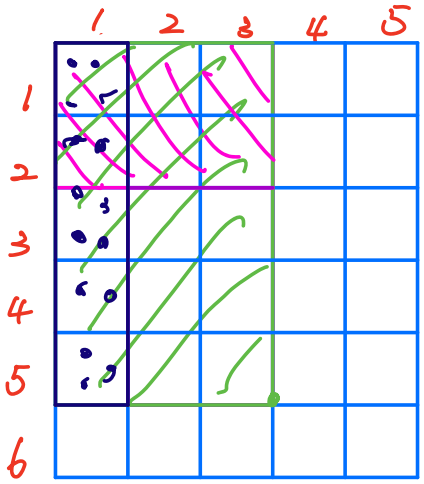


$S[x_1 - 1, y_2] = S[2, 3]$

$S[x_2, y_2] - S[x_1 - 1, y_2] - S[x_2, y_1 - 1] + S[x_1 - 1, y_1 - 1]$

In the example $x_1 = 3, y_1 = 2$

$x_2 = 5, y_2 = 3$

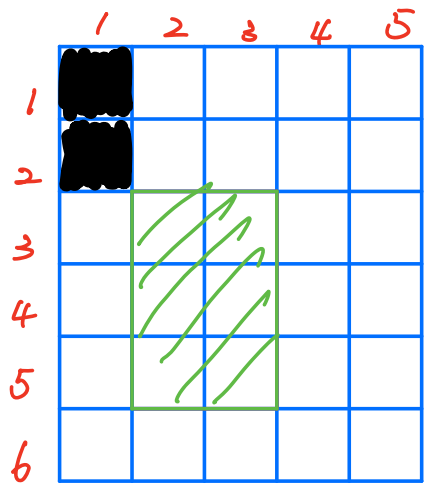


$S[x_2, y_1-1] = S[5, 1]$

$S[x_2,y_2]-S[x_1-1,y_2]-S[x_2,y_1-1]+S[x_1-1,y_1-1]$

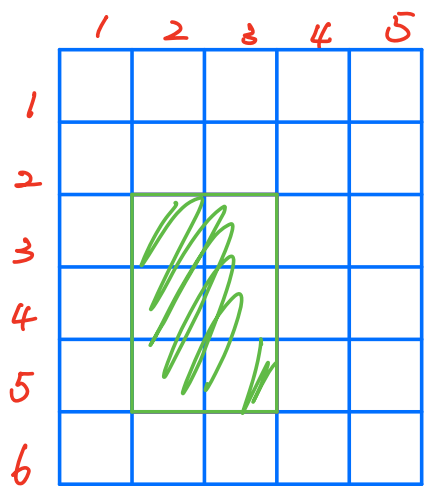
In the example $x_1=3, y_1=2$

$x_2=5, y_2=3$



need to add $S[x_1-1, y_1-1]$ back

$S[x_1-1, y_1-1] = S[2, 1]$



Got it