Uzochi Dimkpa
Extracting 2D
ITCS 5145–001
Parallel Computing
Prof. Erik Saule
January 26, 2023

1

- Tasks: $F[0][0] = C[0][0] \equiv 1, \text{read}(F[0][k-1]) \equiv 1, \text{read}(C[0][k]) \equiv 1, \text{add}(F[0][k-1], C[0][k]) \equiv 3, \text{write}(F[0][k]) \equiv 1, \text{read}(F[i-1][0]) \equiv 1, \text{read}(C[i][0]) \equiv 1, \text{add}(F[i-1][0], C[i][0]) \equiv 3, \text{write}(F[i][0]) \equiv 1, \text{read}(F[i-1][j]) \equiv 1, \text{read}(F[i][j-1]) \equiv 1, \max(F[i-1][j], F[i][j-1]) \equiv 3, \text{read}(C[i][j]) \equiv 1, \text{add}(\max(F[i-1][j], F[i][j-1]), C[i][j]) \equiv 3, \text{write}(F[i][j]) \equiv 1, \text{read}(F[n-1][m-1]) \equiv 1, \boldsymbol{\Theta(N)} = \boxed{\boldsymbol{6m + 6n + 10mn + 2}}$
- **Dependencies:**

$$F[0][0] = C[0][0] \rightarrow \text{read}(F[0][k-1]) + \text{read}(C[0][k]) + \text{write}(F[0][k]) \rightarrow \text{read}(F[i-1][j]) + \text{read}(F[i][j-1]) + \text{read}(C[i][j]) \rightarrow \max(F[i-1][j], F[i][j-1]) + \text{read}(C[i][j]) \rightarrow +\text{add}(\max(F[i-1][j], F[i][j-1]), C[i][j]) \rightarrow \text{write}(F[i][j]) \rightarrow \text{read}(F[n-1][m-1])$$

- $\boldsymbol{width} = \boxed{\boldsymbol{3mn}}$
- $\sum \boldsymbol{p_i} = \boxed{\boldsymbol{6m + 6n + 10mn + 2}}$
- $\boldsymbol{T_\infty} = \boxed{\boldsymbol{6m + 6n + 10mn + 2}}, \boldsymbol{length} = \boxed{\boldsymbol{7}}$

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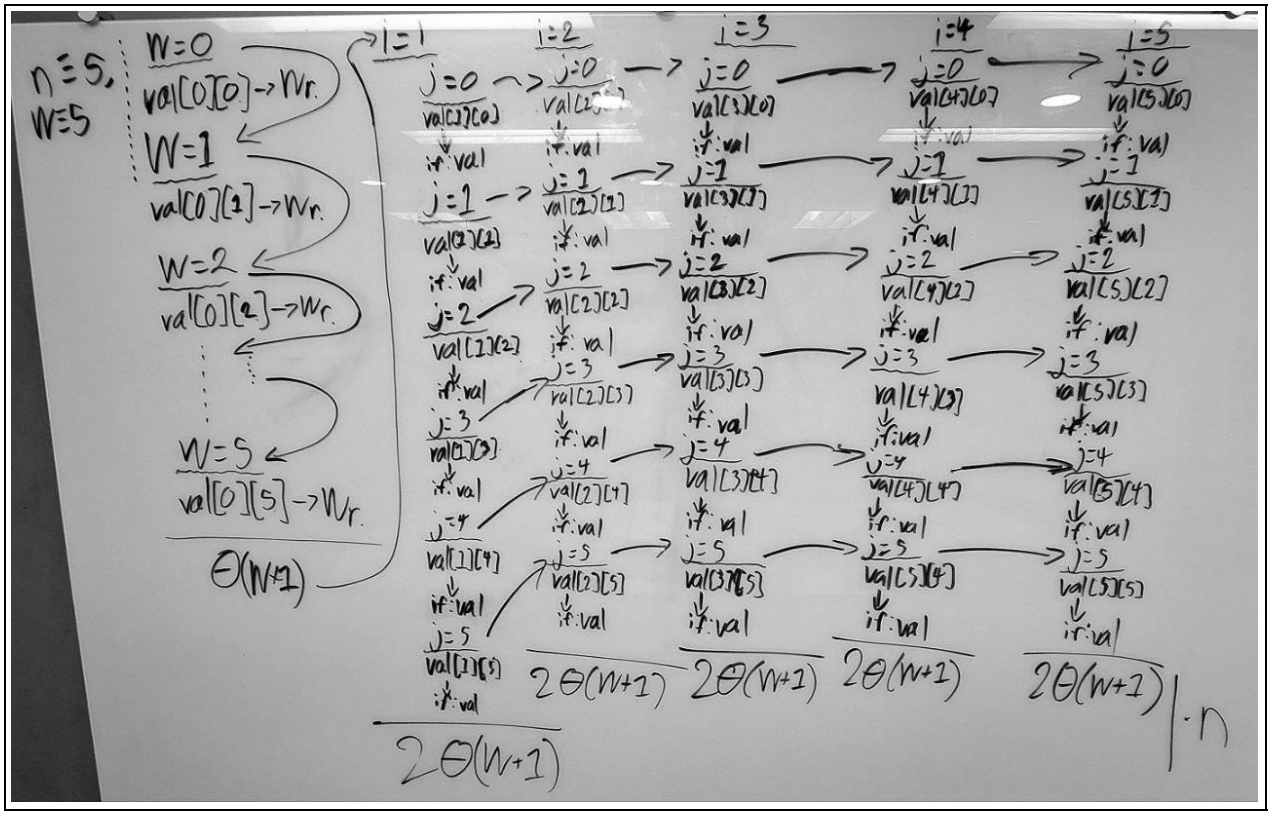
- **Complexity:** $\Theta(N) = \boxed{(10n+1)\Theta(W+1)}$
- **Dependencies:**



- $\boldsymbol{width} = \boxed{W}$
- $\sum p_i = \boxed{(10n+1)\Theta(W+1)}$
- $T_\infty = \boxed{(10n+1)\Theta(W+1)}$, $\boldsymbol{length} = \boxed{W+n}$

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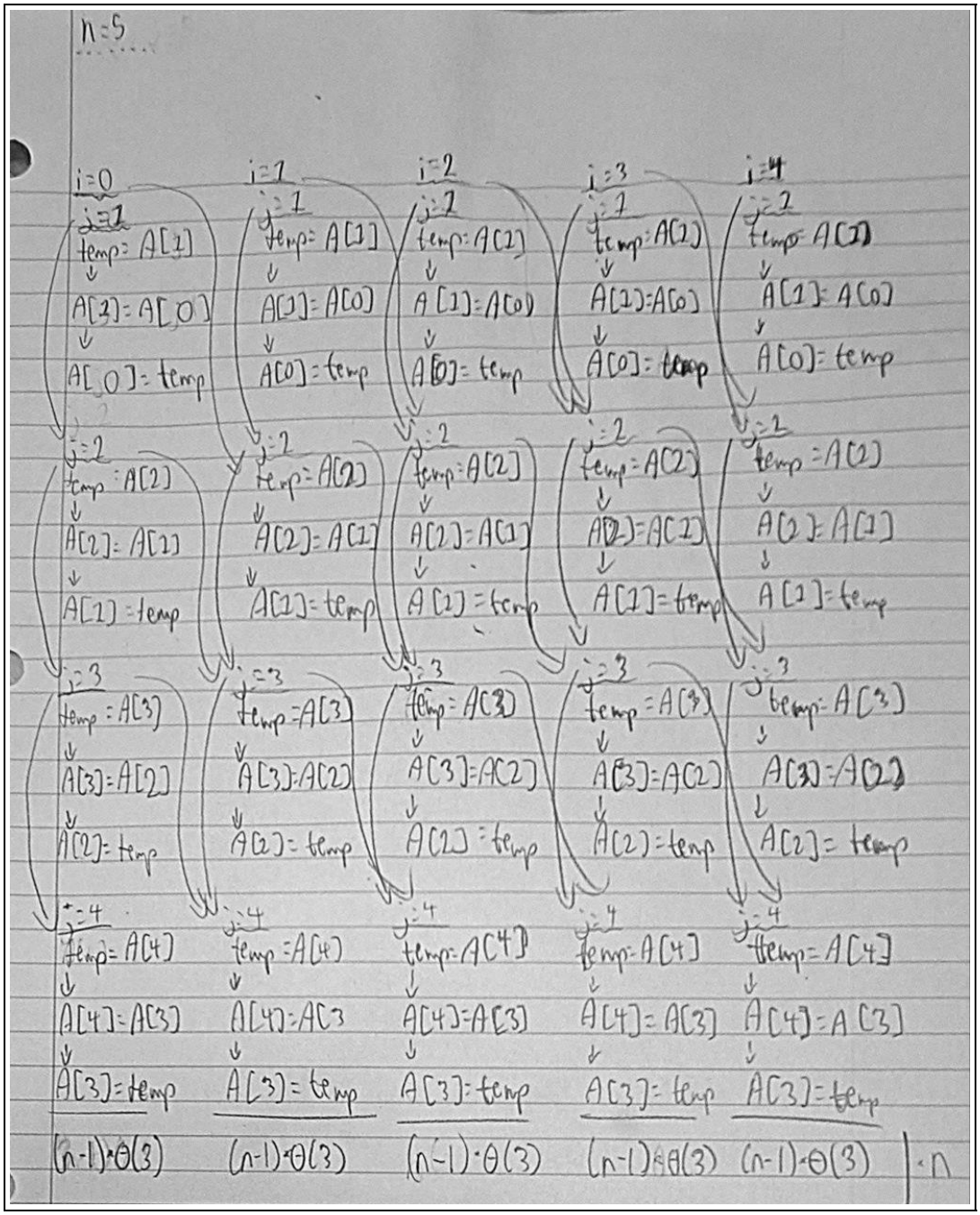
- **Complexity:** $\boldsymbol{\Theta(N) = \boxed{n(n-1)\Theta(3)}}$
- **Dependencies:**



- $\boldsymbol{width = n}$
- $\boldsymbol{\sum p_i = \boxed{n(n-1)\Theta(3)}}$
- $\boldsymbol{T_\infty = \boxed{(n-1)\Theta(3)}, length = \boxed{n-1}}$