**Generalized Warehouse Slotting Strategy**

I have a warehouse pick-frequency grid (CSV or Excel) where each cell represents one unique SKU, arranged row-wise (e.g., SKU0 at (0,0), SKU1 at (0,1), etc.).

I want to run a **complete slotting optimization analysis** with the following specifications:

**🔧 Problem Functions to Perform:**

1. Load and flatten the grid into SKU list with positions and frequencies
2. Conduct Pareto analysis to compute cumulative pick %
3. Classify SKUs into ABC classes based on user-defined thresholds (default A=20%, B=30%, C=50%)
4. Compute Manhattan distance from each grid cell to the dock location
5. Exclude obstacle positions (if any) from slot assignment
6. Assign A-class SKUs to closest cells to the dock, followed by B and C
7. Generate an optimized layout grid showing final SKU placements
8. Optionally, output a table of original vs. new positions with ABC class
9. Provide a brief justification for the dock position
10. Return results in grid format and/or structured tables

**Inputs I’ll Provide:**

* The pick-frequency grid (CSV or Excel)
* Dock location (e.g., (4,3))
* Obstacle locations, if any (e.g., [(2,4)])
* Custom ABC thresholds (optional)

**Expected Output:**

* Optimized SKU layout grid
* ABC classification table with pick frequency, cumulative picks, and %
* Table mapping old positions to new ones
* Dock position justification (1–2 sentences)
* Optional:exportable Excel or CSV file