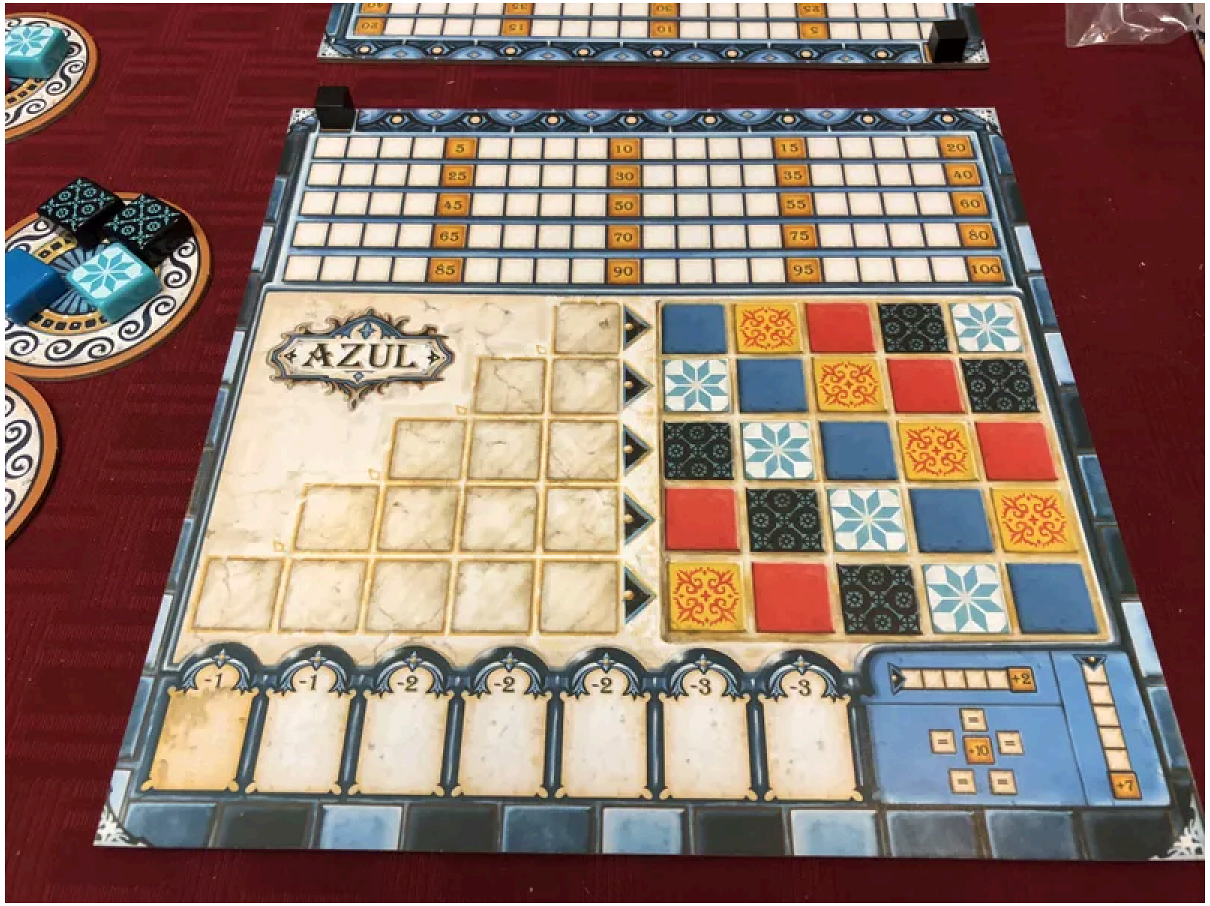
Azul


5
10
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85
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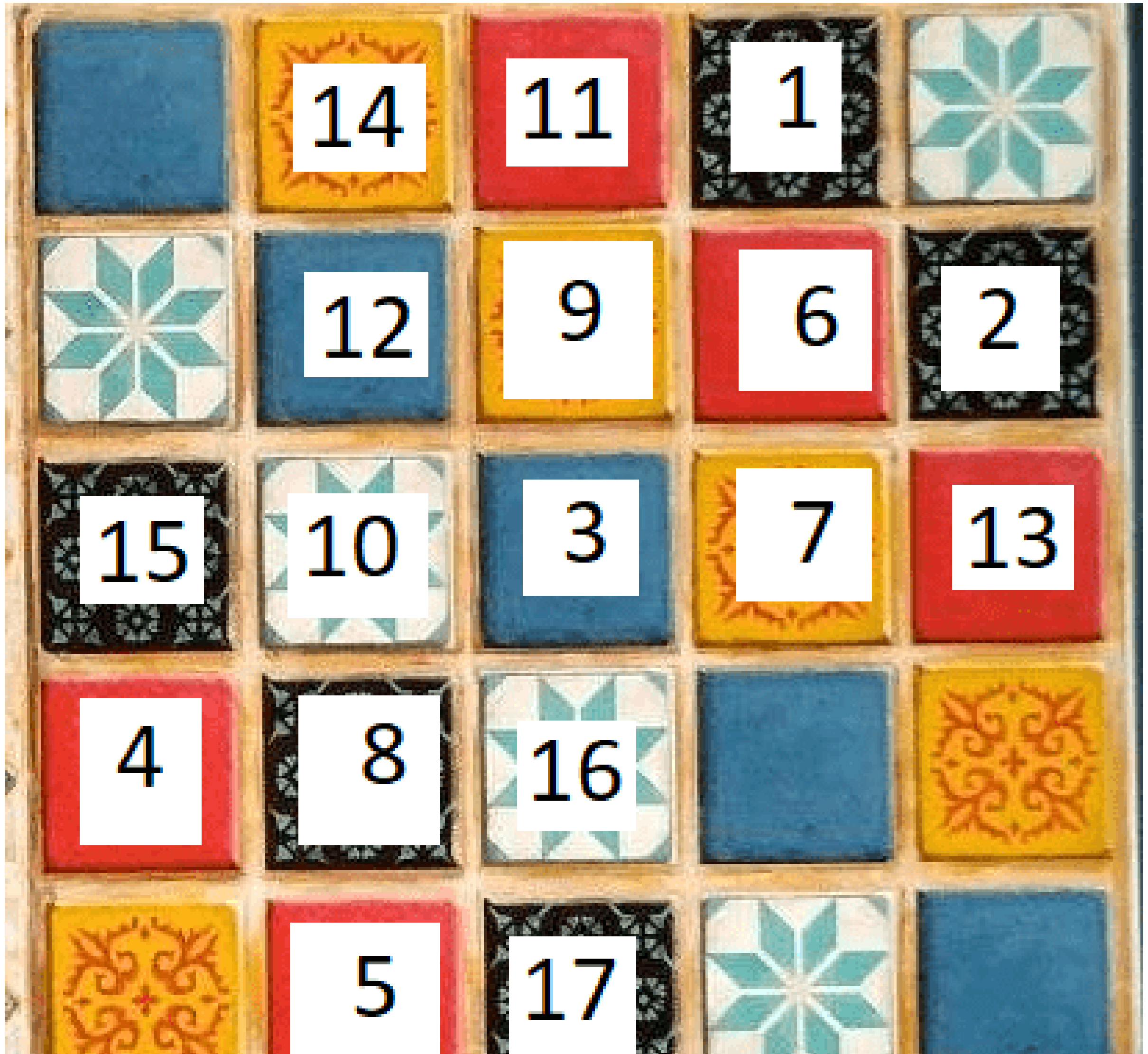
AZUL
-1
-1
-2
-2
-2
-3
-3
+2
+10
+7

My Inspiration

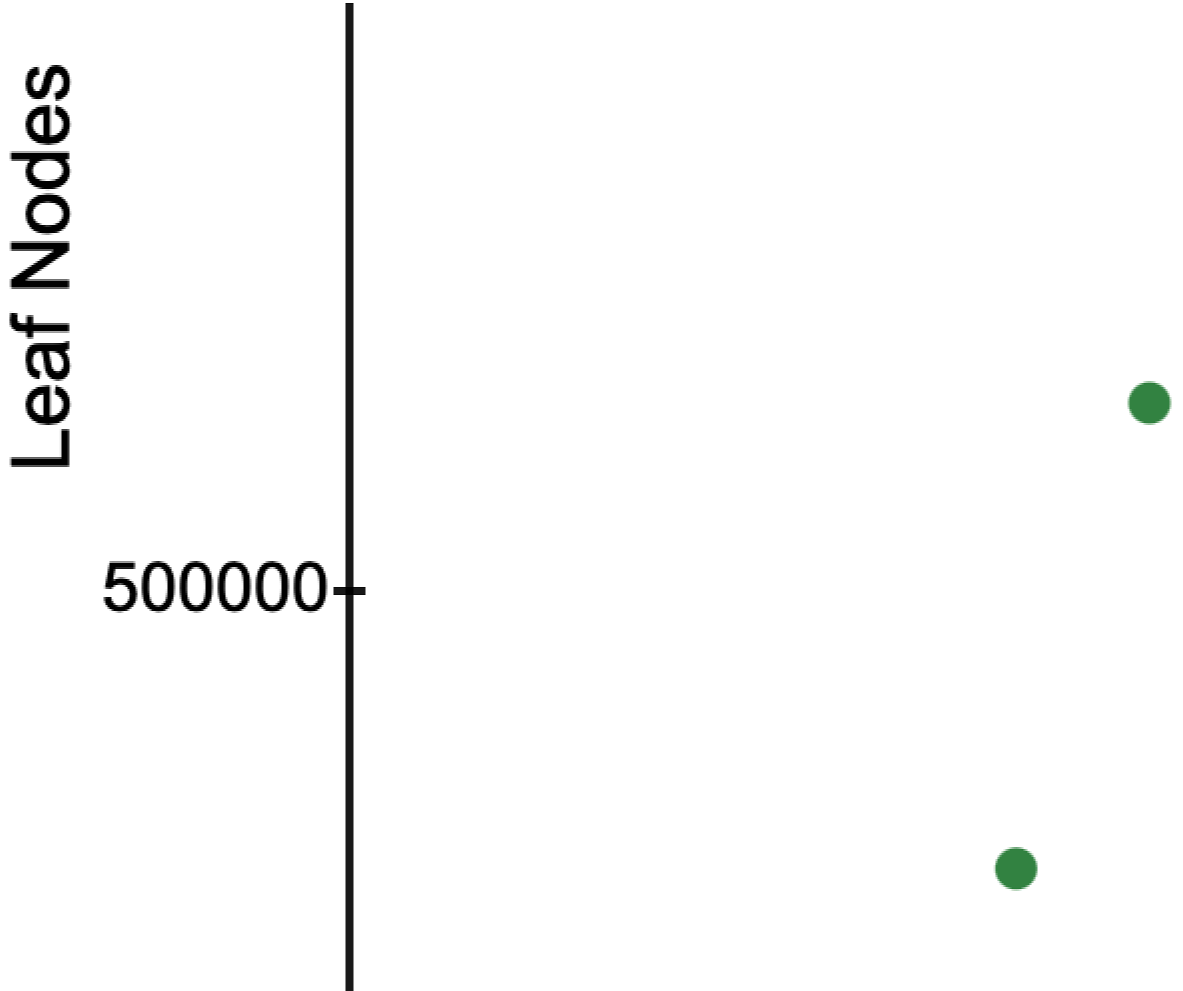


Tree Search Monte Carlo Simulation

- Embarrassingly parallel
- Rapidly growing state space

Finding an Approach

- Extreme scaling challenge



My Approach

- 2 tiles per row, no duplicate colors
- Breadth-first search

Parallelization Method

- BFS supports parallel frontier expansion
- Independent nodes for each level
- Work distribution across threads

Rayon vs OpenMP

- Rayon: work-stealing, dynamic load balancing
- OpenMP: static/dynamic scheduling options
- Memory model differences
- Ease of nested parallelism
- Rust safety vs C/C++ control

MPI + Rayon Hybrid

- MPI for first-level branching
- Rayon for deeper parallelism

Results

(Insert data visuals here)

Scoring Progression

Step 1 — Score: 2

1/1		X			
2/2					X
2/3					
2/4					
2/5					

Step 2 — Score: 10

1/1		O		X	
2/2				X	O
3/3			X		
4/4			X		
2/5					

Step 3 — Score: 18

1/1	X	O		O	
2/2			X	O	O
2/3			O		
2/4			O		
4/5					

Step 4 — Score: 43

1/1	O	O	X	O	
2/2		X	O	O	O
3/3		X	O		
4/4		X	O		
4/5					

Step 5 — Score: 55

1/1	O	O	O	O	X
0/2		O	O	O	O
2/3		O	O		
2/4		O	O		
5/5		X			

Step 6 — Score: 75

0/1	O	O	O	O	O
2/2	X	O	O	O	O
3/3		O	O	X	
4/4		O	O	X	
2/5		O			

Questions