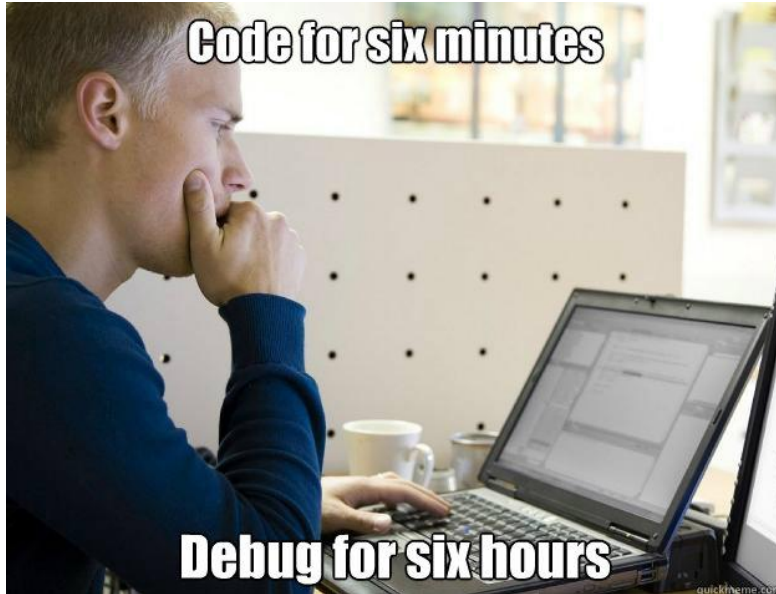

Clean Code

— Boston University CS 506 - Lance Galletti —

The Problem



The Problem

“Software Systems get replaced not when they wear out but when they crumble under their own weight because they have become too complex”



Why Does this Occur?

vocabulary + grammar != poetry

Set yourself up for success

- Stay organized - have a plan and prioritize!
- Structure
 - Do one thing
 - Compartmentalize
 - Many functions with small bodies > one function with a large body
 - Before writing code ask “How will someone use this (or part of this) code?”. Minimize side effects
- Method / Process
 - Top Down Approach
 - Bottom up Approach
 - Solve the 90% problem first - then improve / refine to get to 100%
 - Boring code is good code: keep it simple
 - Check soundness by reading your code before testing

Clean Code

'Clean code' by Robert C. Martin

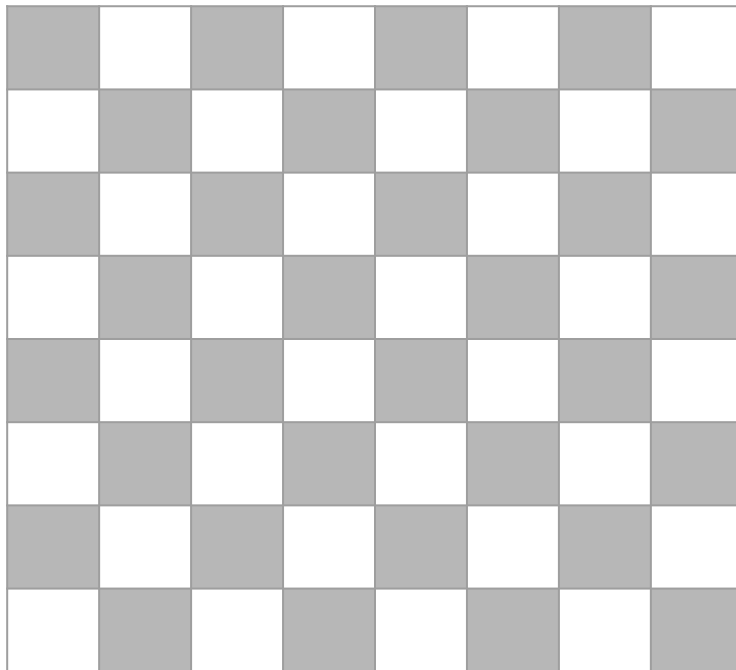
Github Gist Summary of the Book:

<https://gist.github.com/wojteklu/73c6914cc446146b8b533c0988cf8d29>

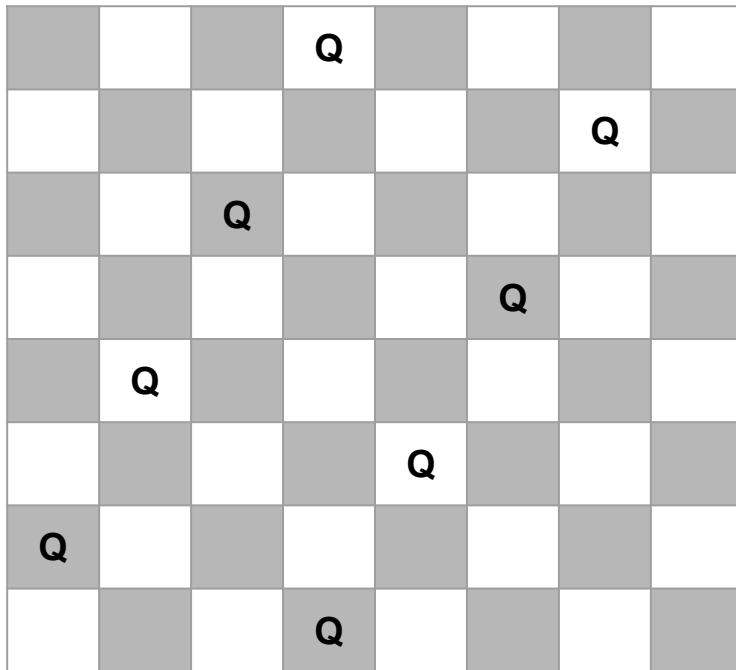
But if you must debug

1. **Don't Panic!**
2. Read the error
 - What is the error telling you?
 - Where did the error occur?
 - Is this a cause or just a symptom (one bug can hide another)?
3. Re-read your code - take your time!
 - Can you mentally trace through your code to reproduce the error in your head?
 - If not: your code may need some refactoring because it's too complex!
4. Sanity check where you can
 - Is everything set up properly? Are the things that are supposed to communicate actually communicating?
5. Now look online for some help
 - Hopefully with the above out of the way you have a good idea what to search for in order to actually fix the issue
6. Take breaks

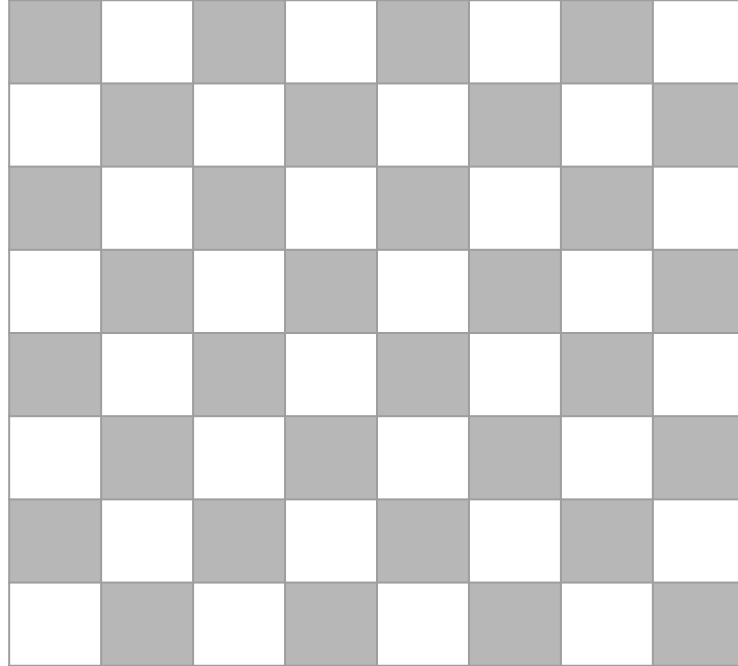
The 8-queen puzzle



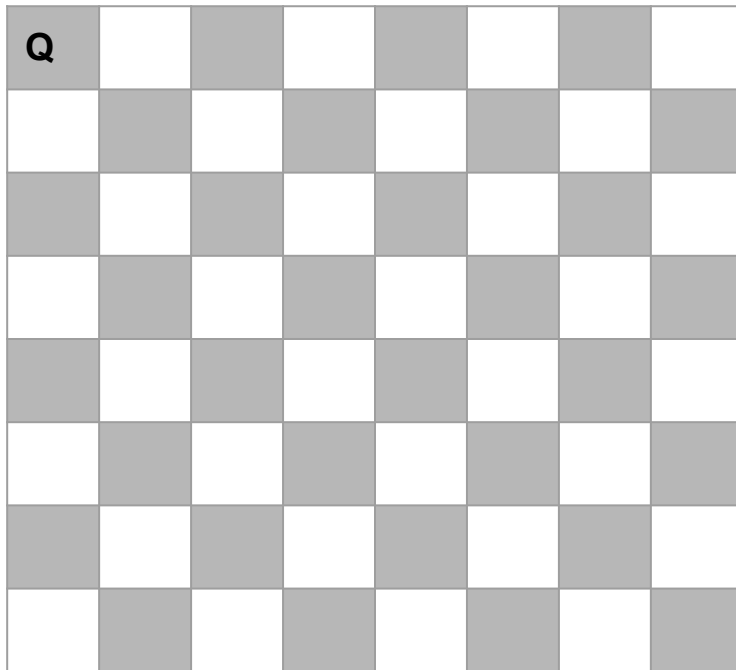
The 8-queen puzzle



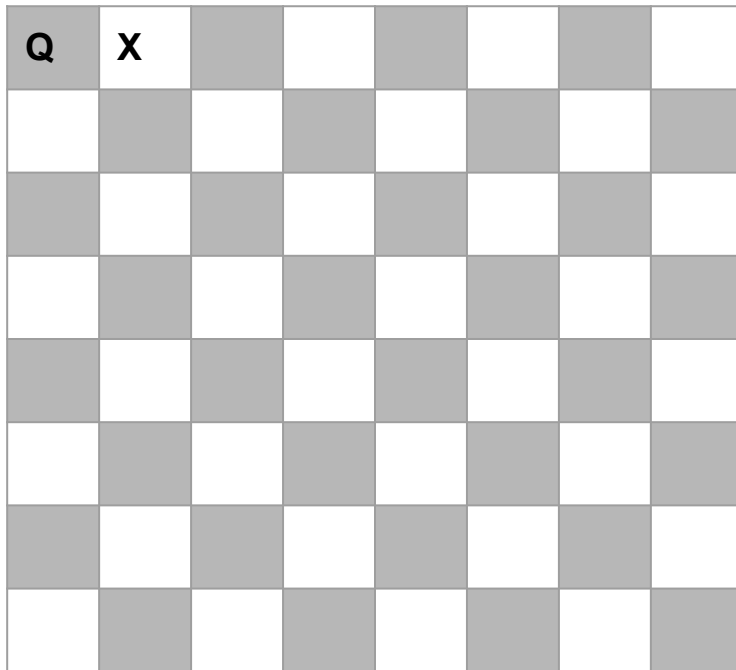
Searching for solutions



Searching for solutions



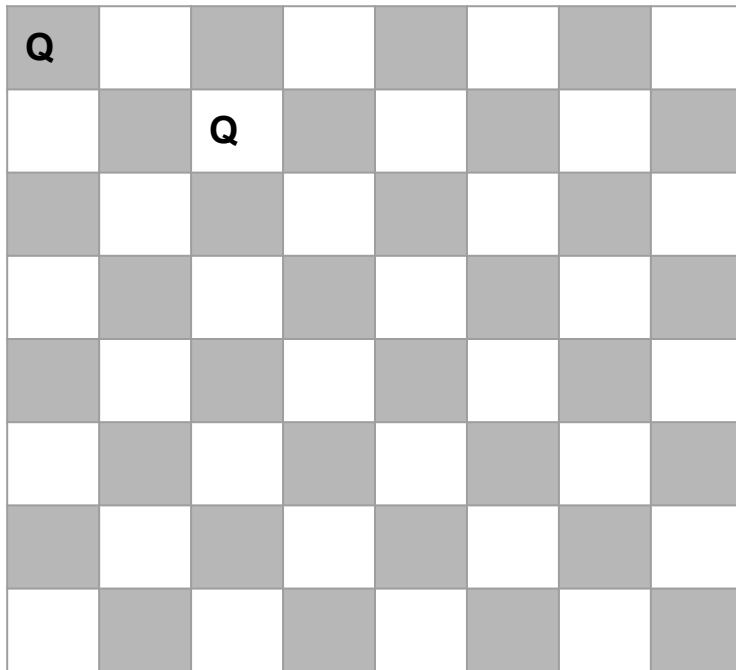
Searching for solutions



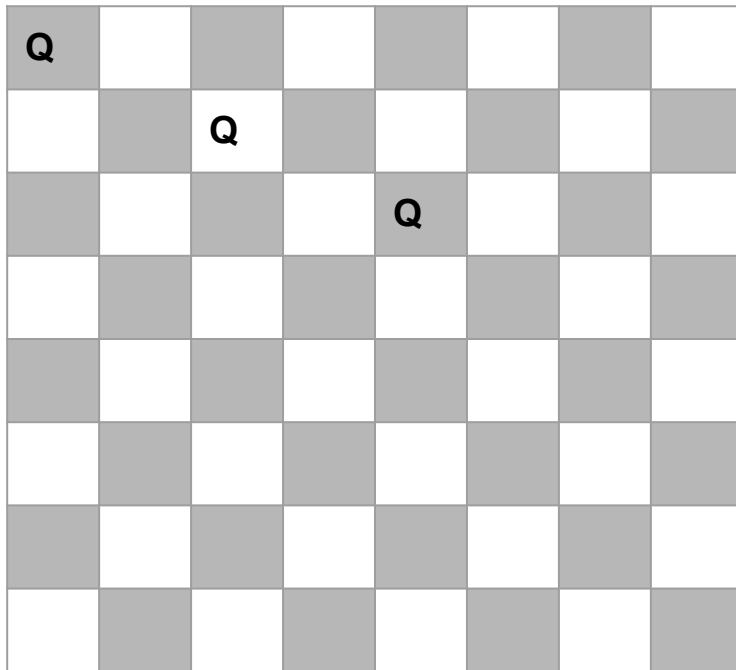
Searching for solutions

[illegible]

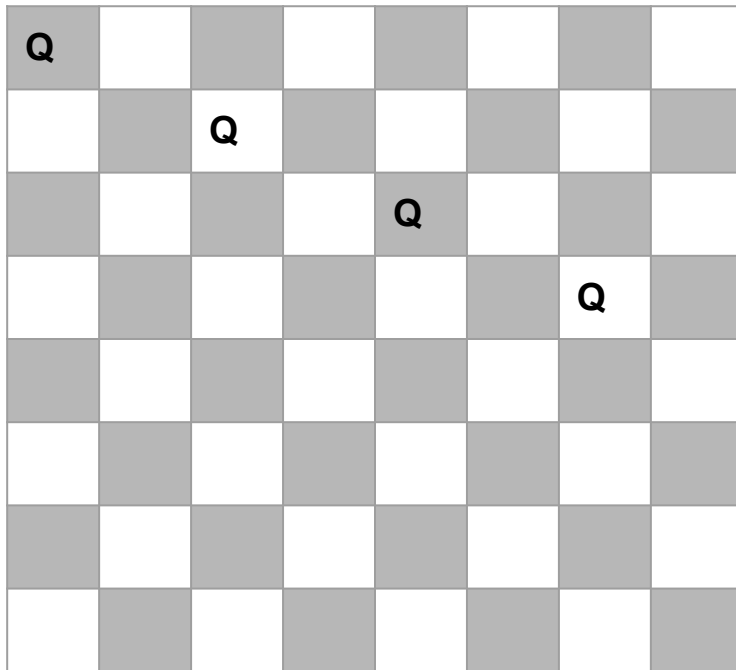
Searching for solutions



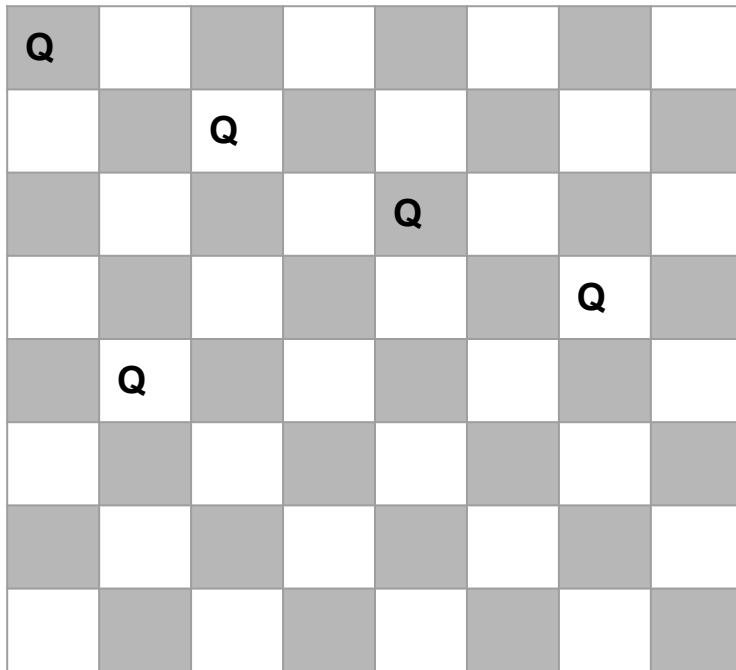
Searching for solutions



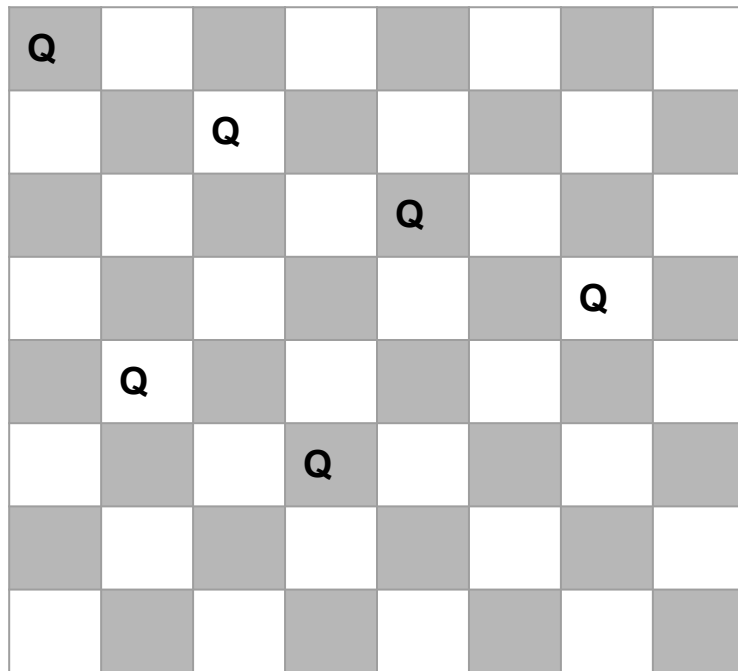
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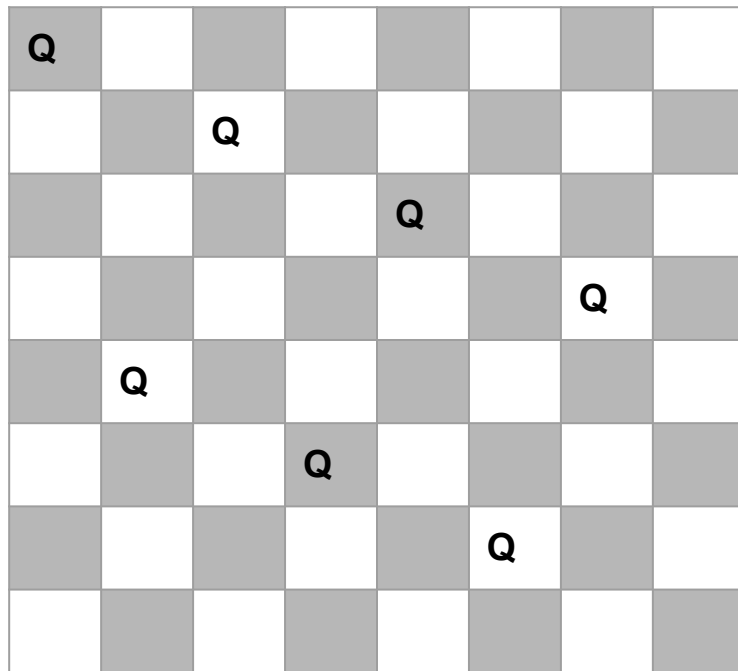
Searching for solutions



Searching for solutions



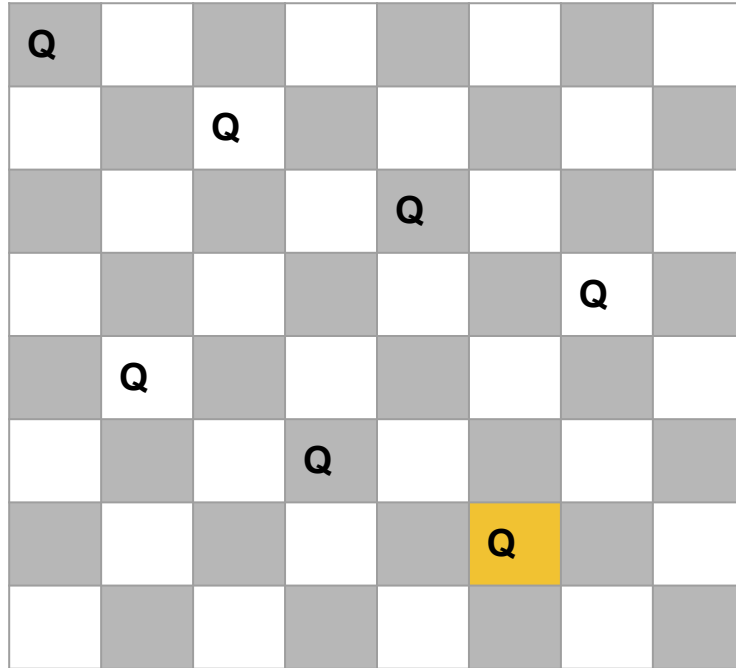
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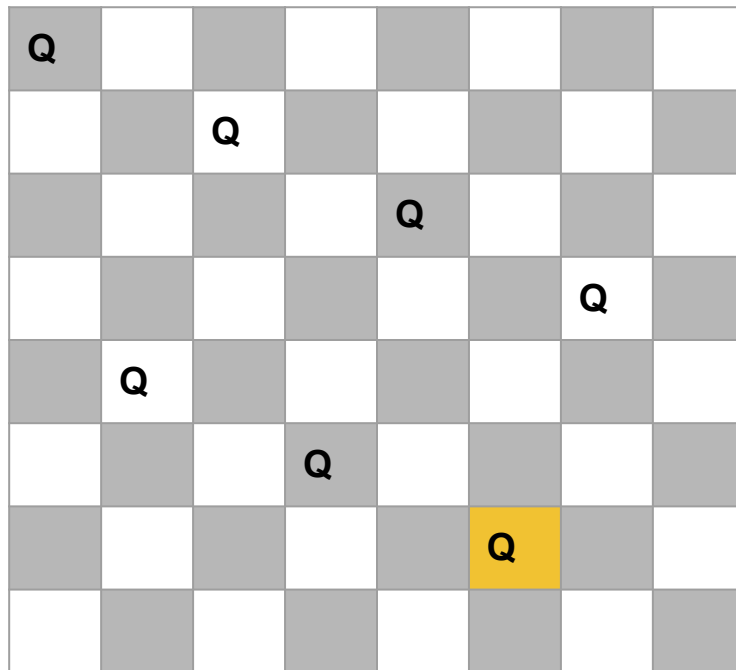
Searching for solutions

Q							
		Q					
				Q			
						Q	
	Q						
			Q				
					Q		
X	X	X	X	X	X	X	X

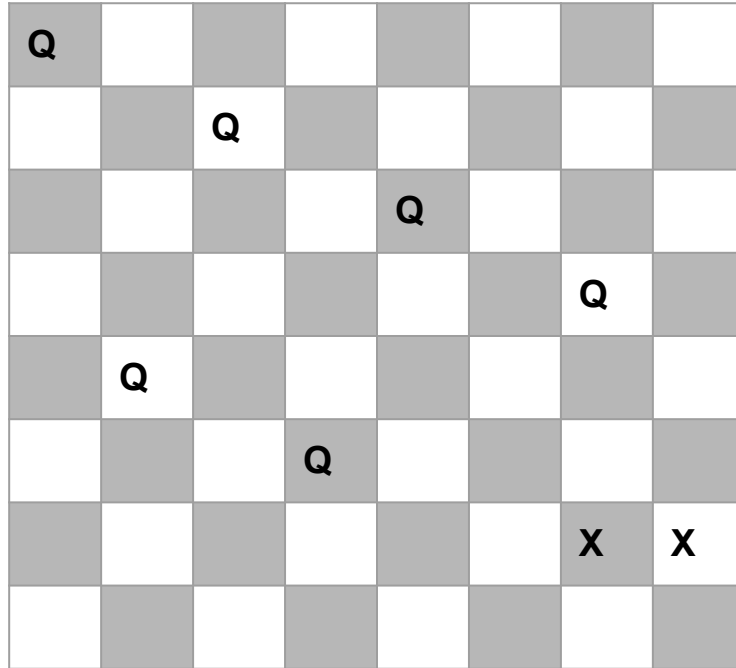
Go back to adjust the previous queen



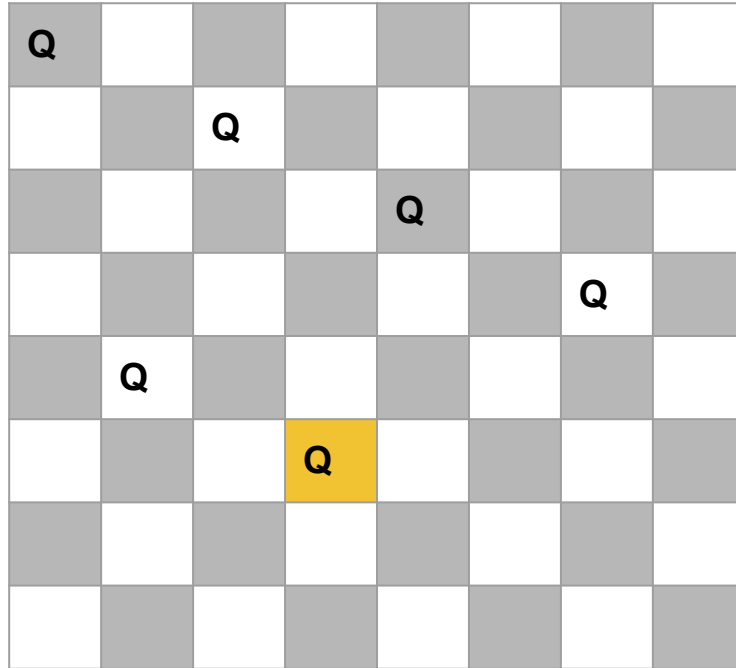
Explore from here



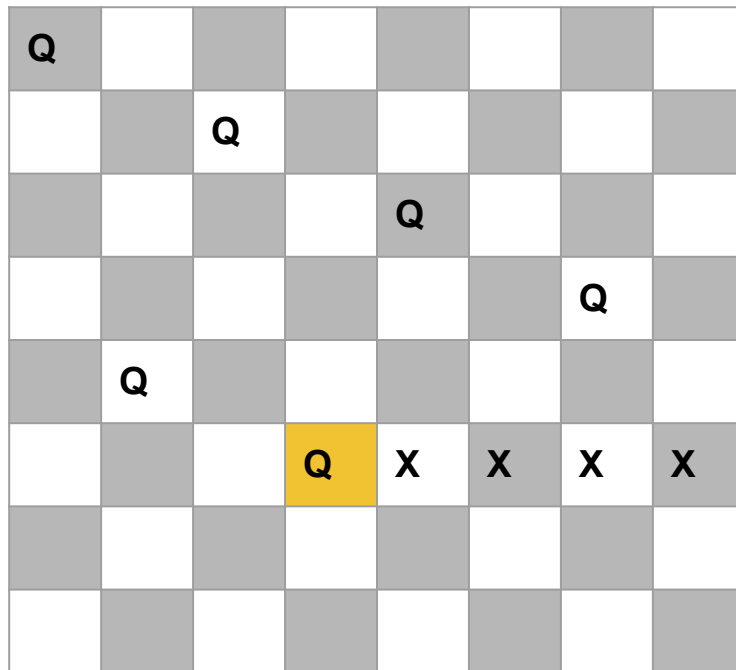
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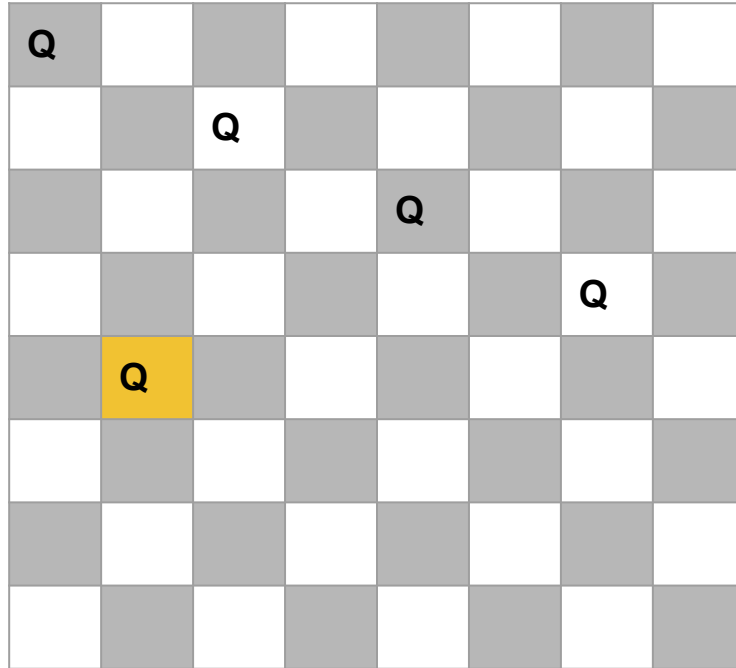
Go back again to adjust the previous queen



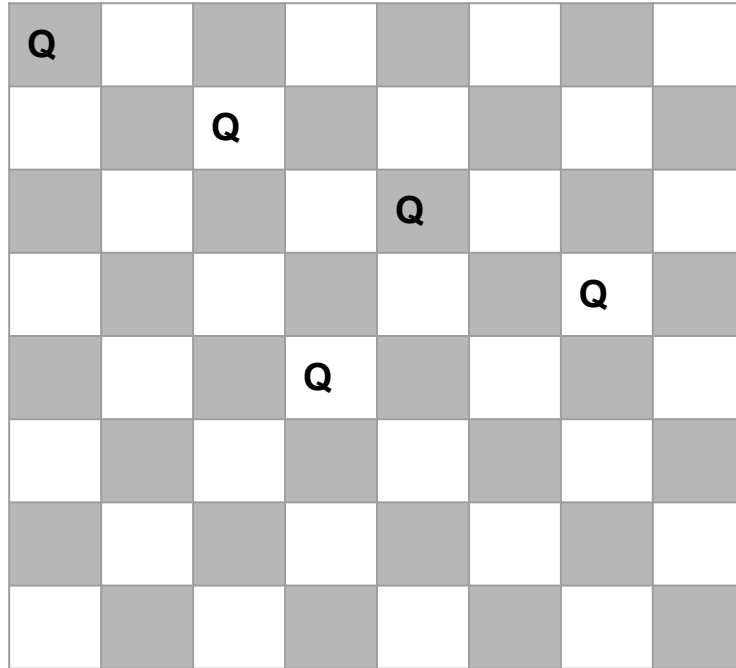
Explore from here



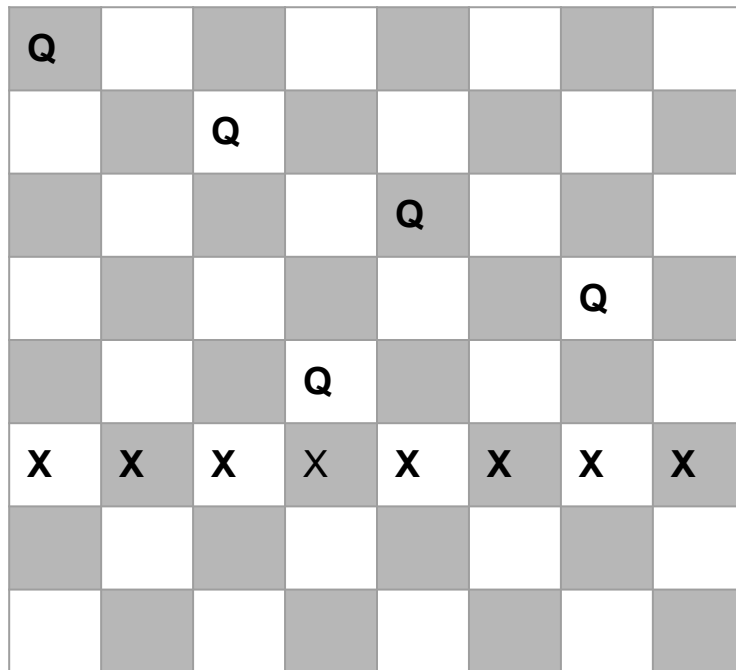
Go back again to adjust the previous queen



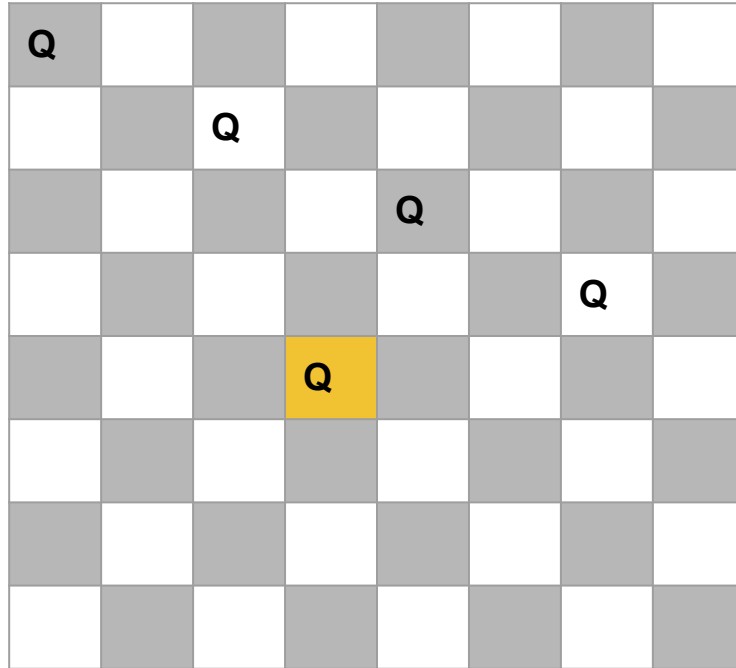
Found another option - keep searching!



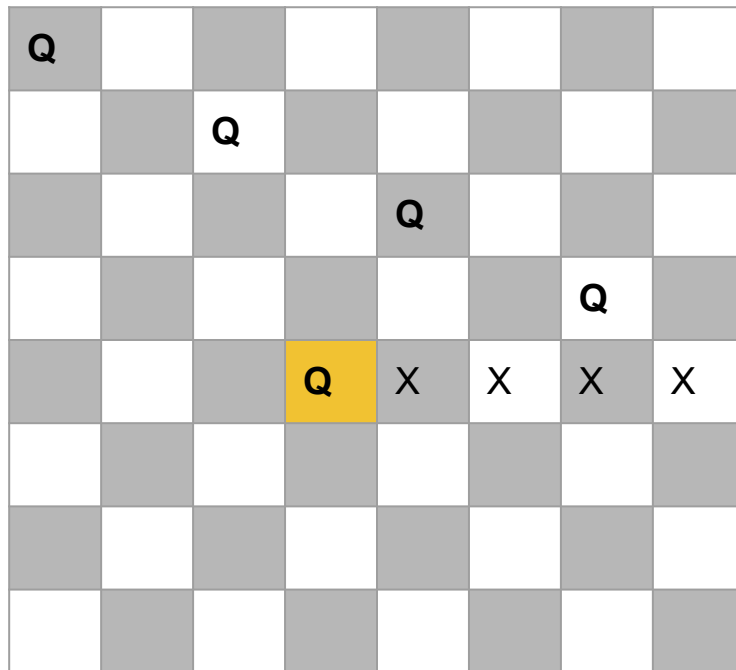
Go back



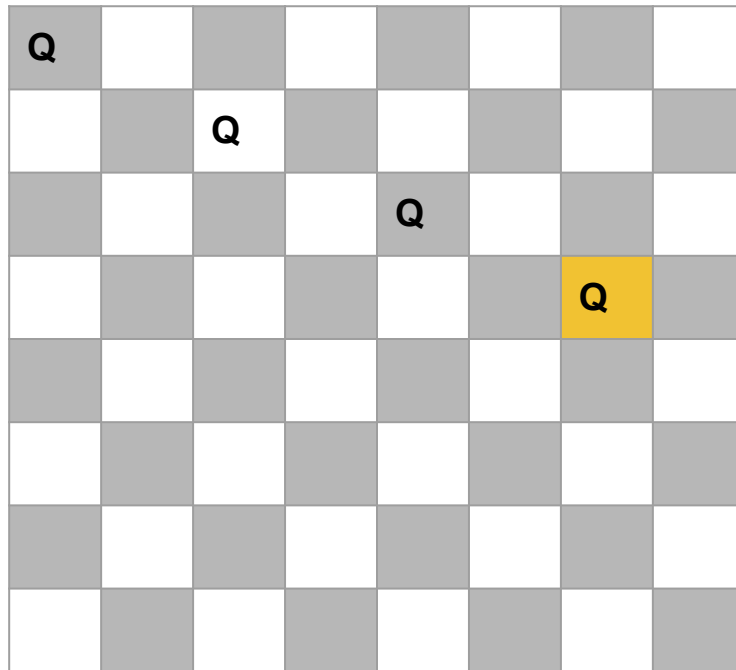
Go back



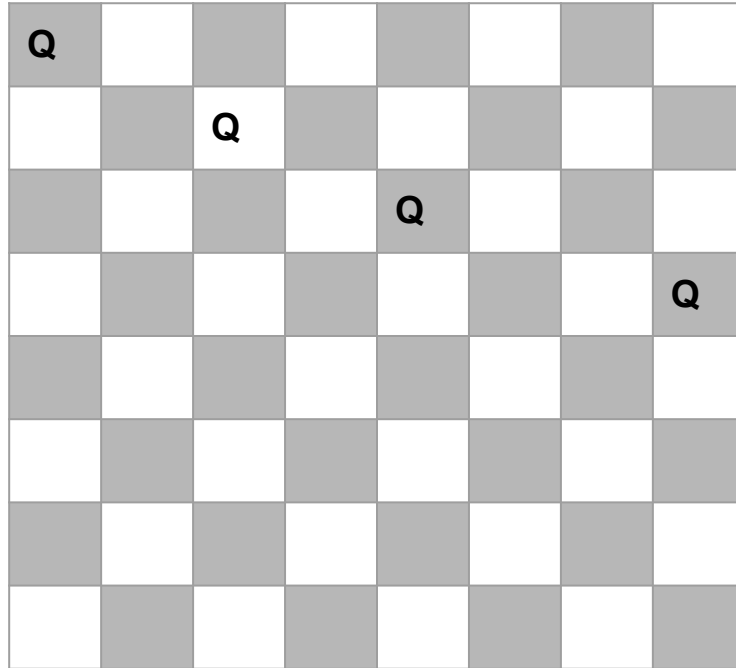
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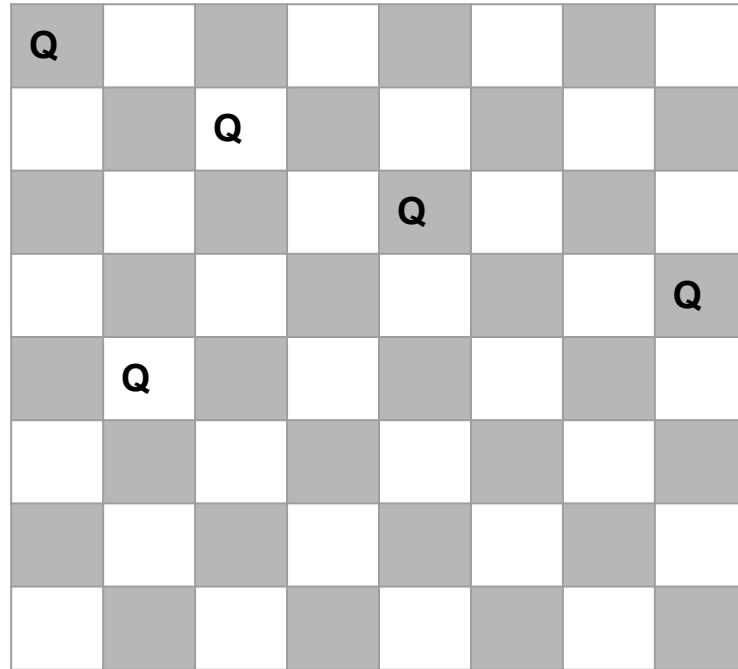


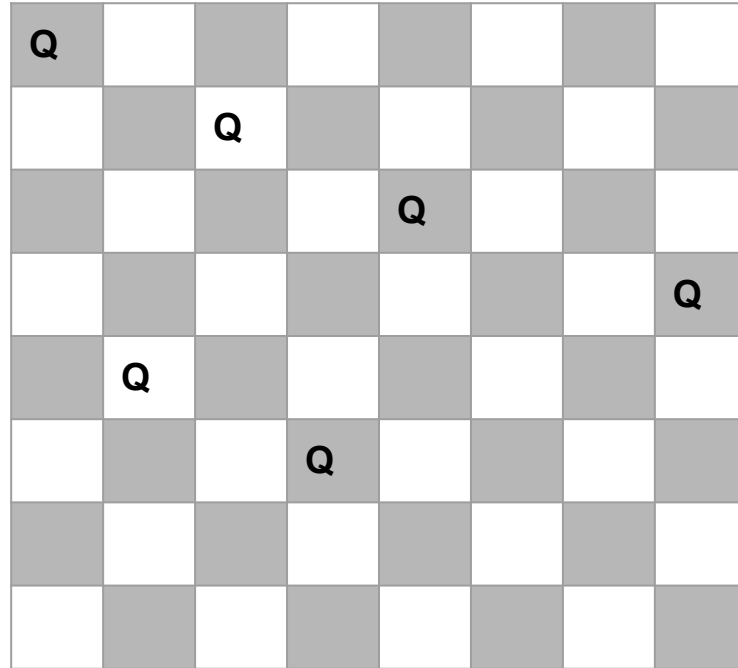
Go back again

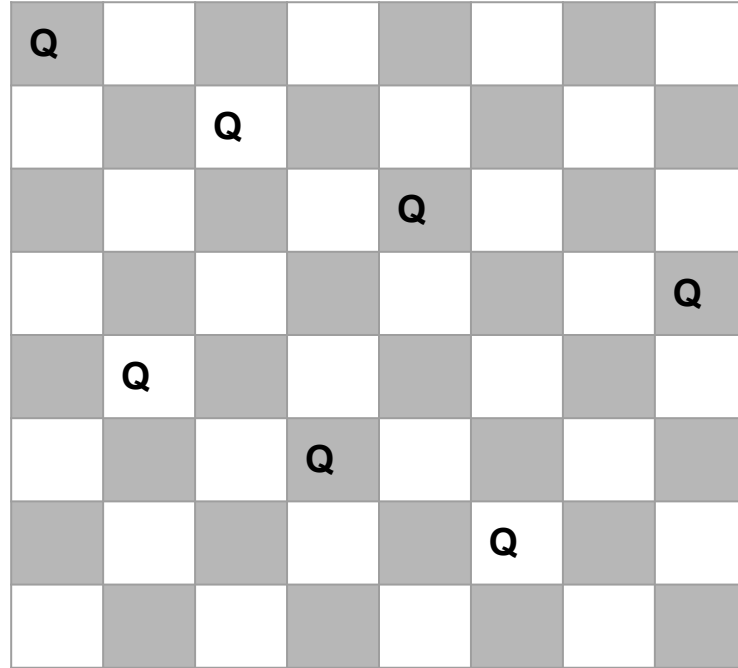


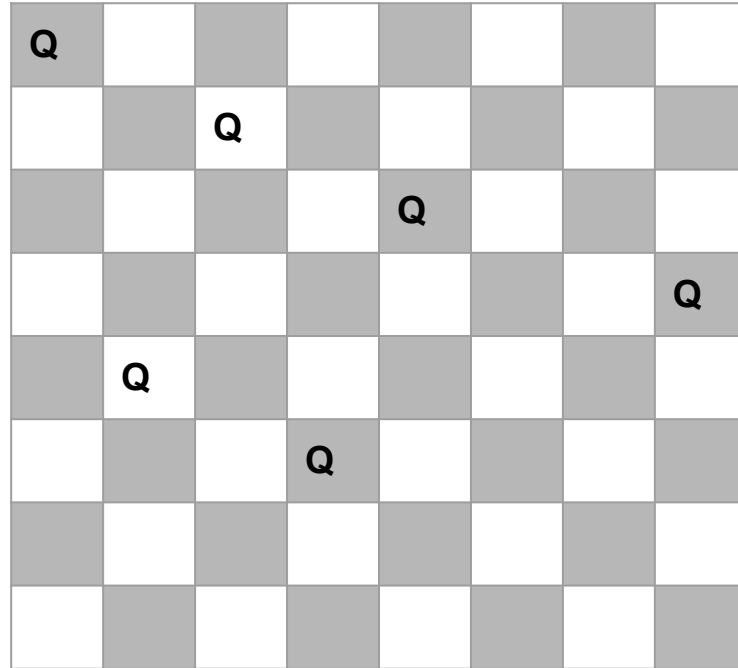
Found another option - search from there

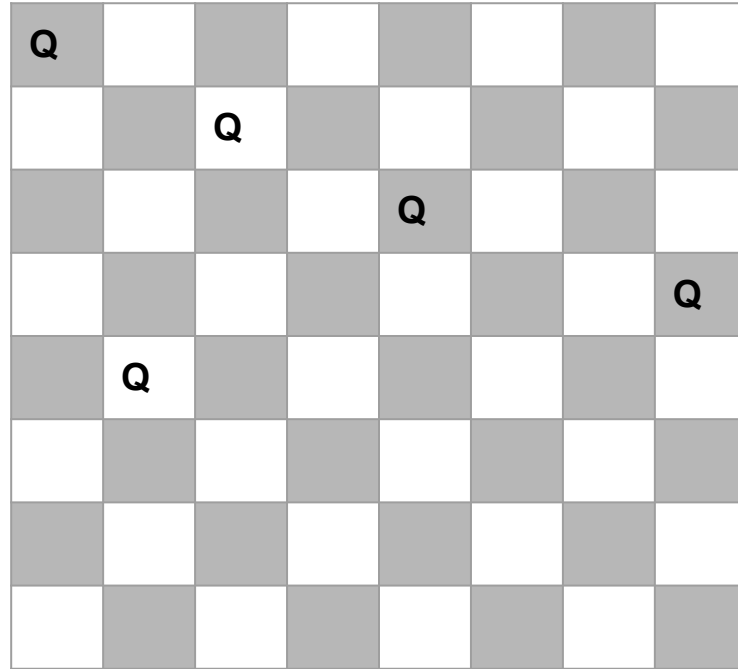


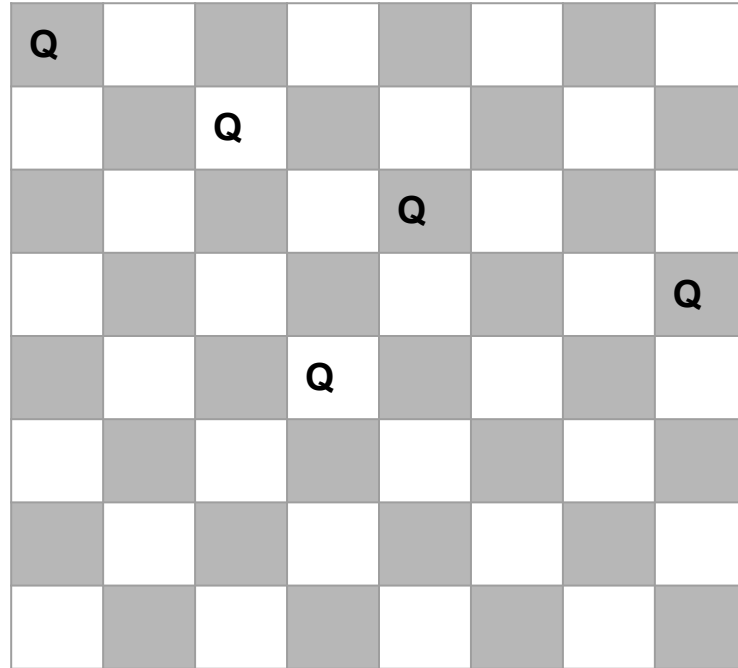


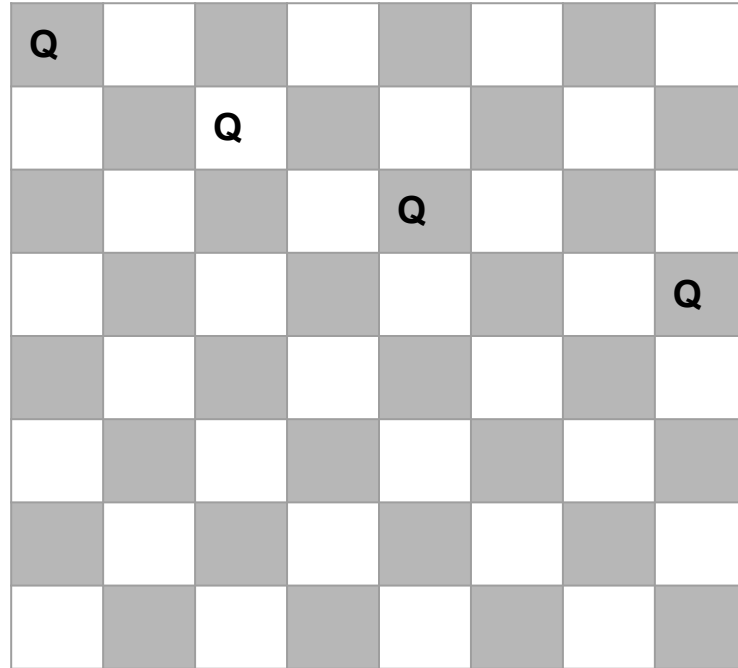


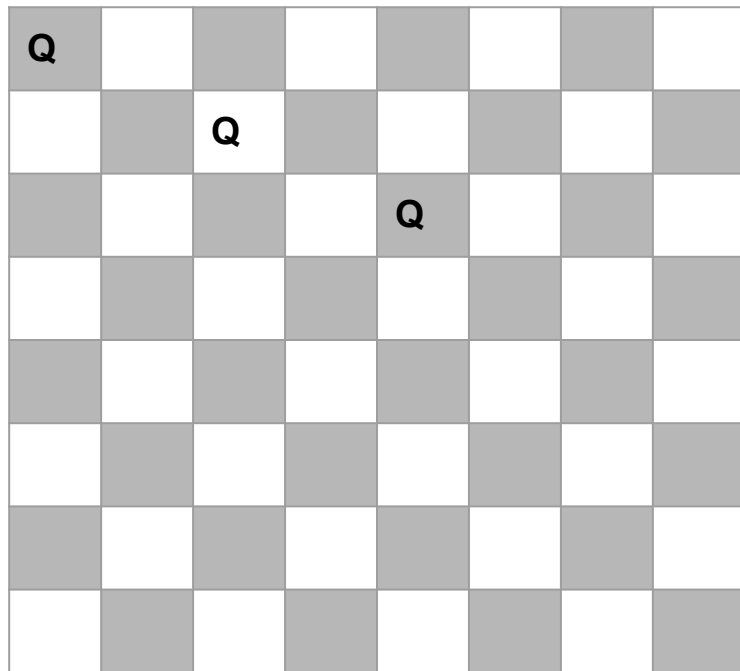


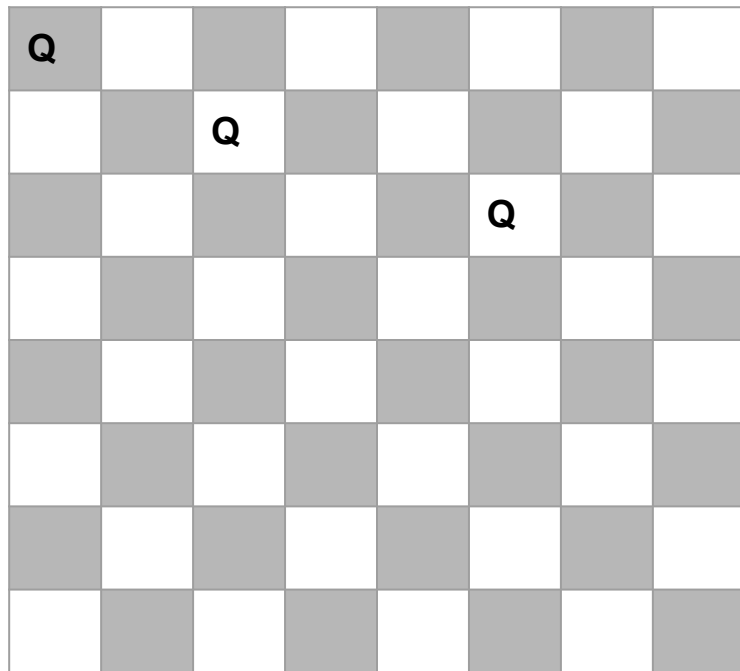


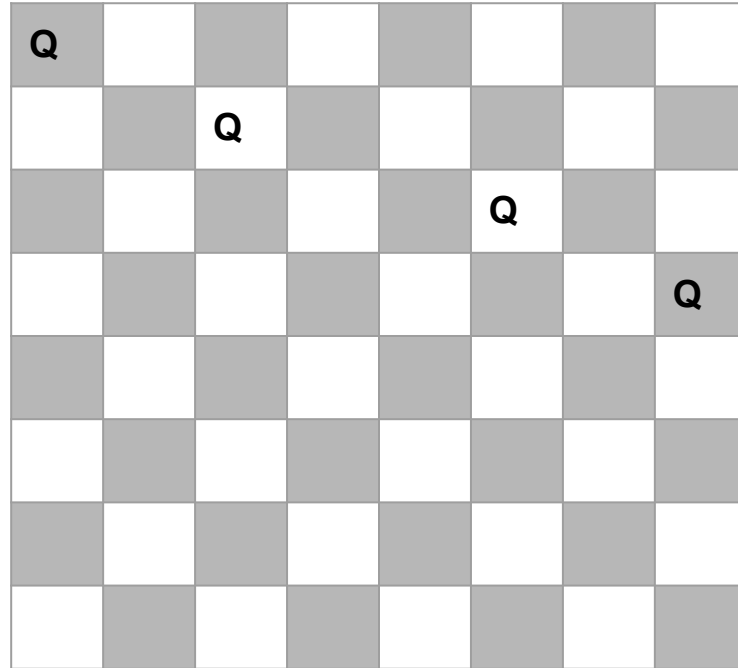


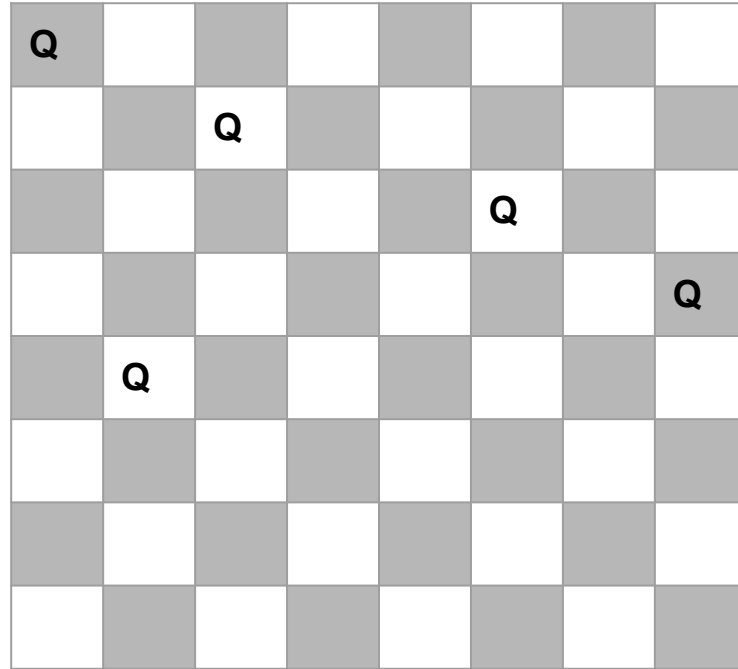


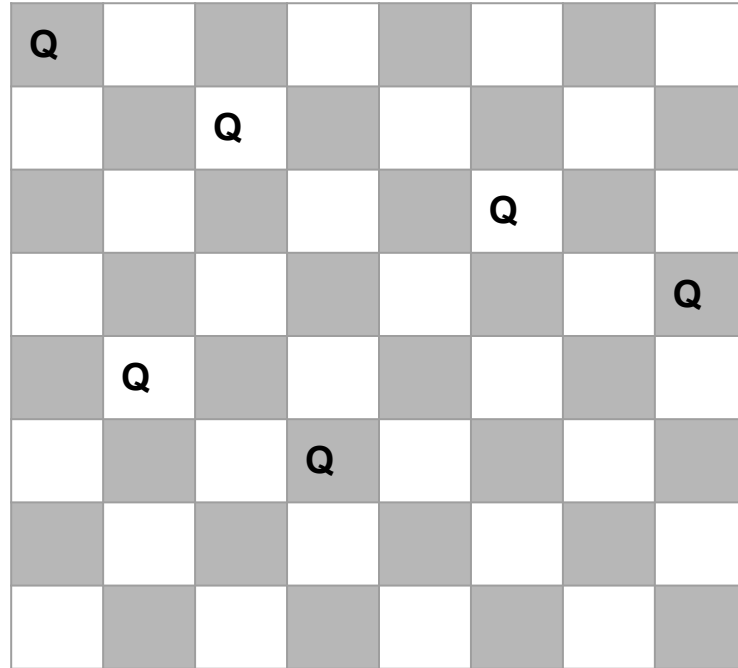


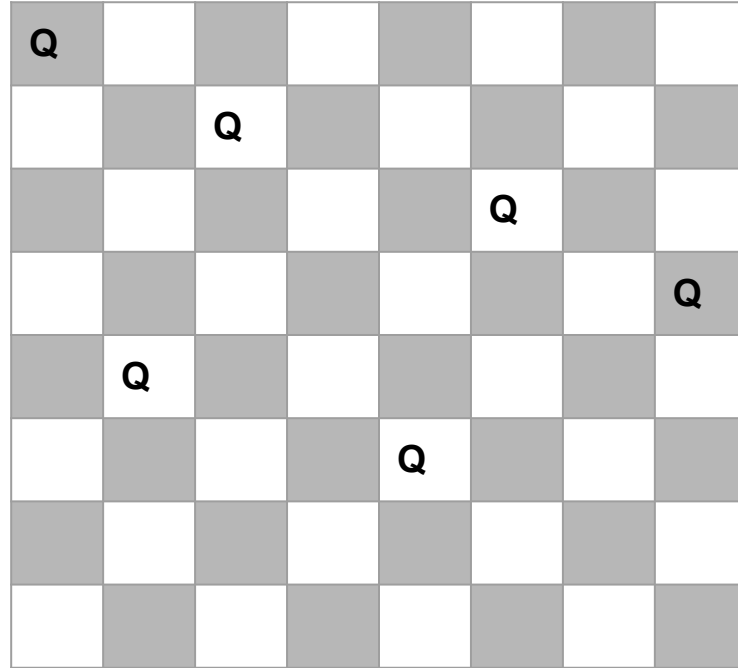


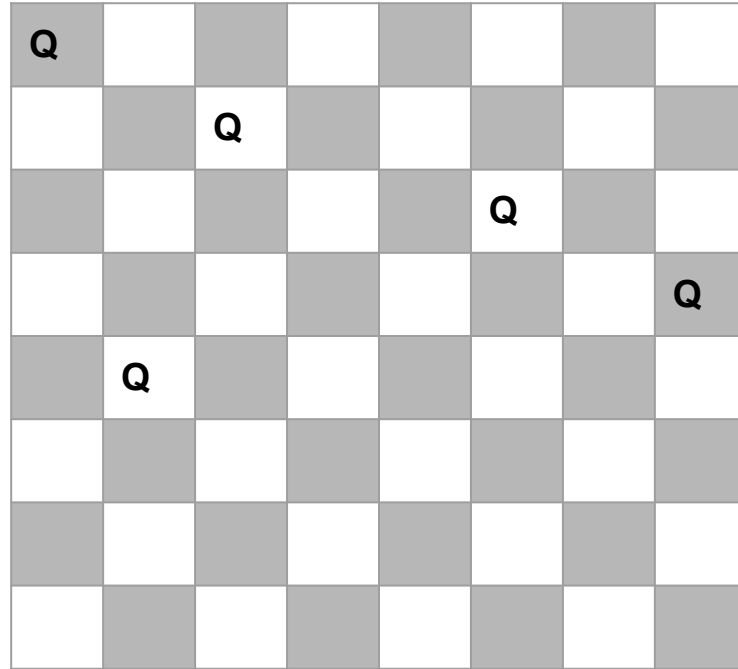


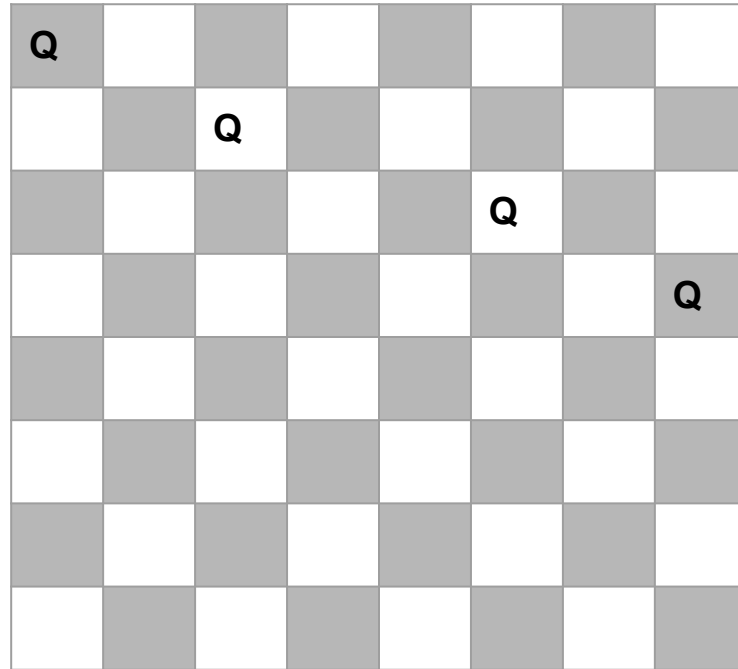


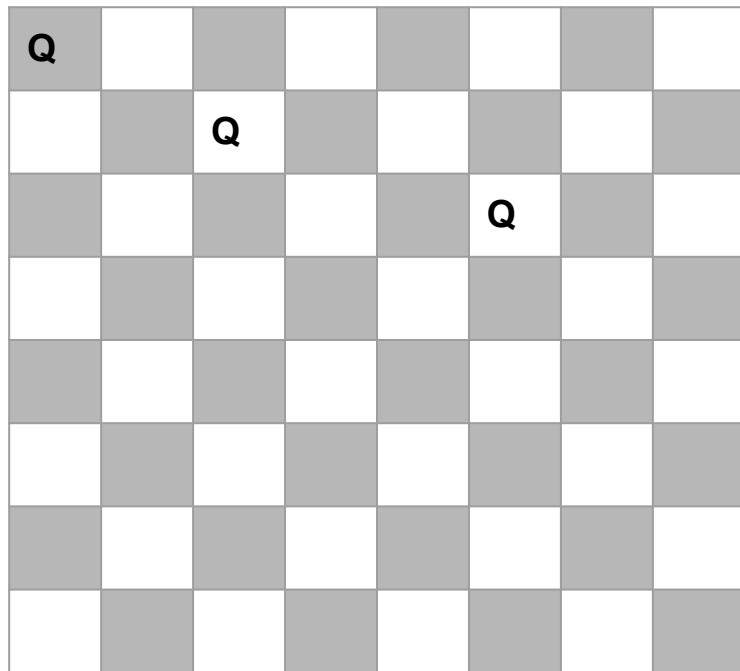


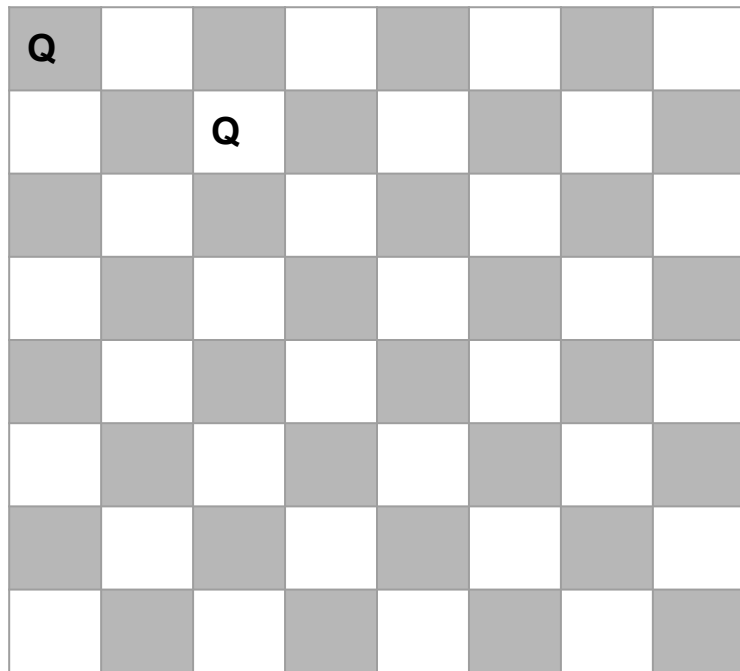


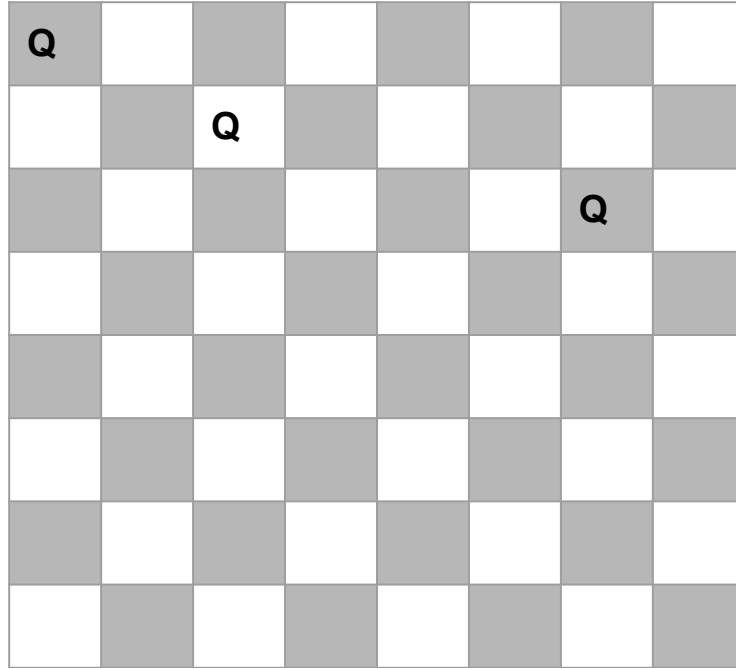


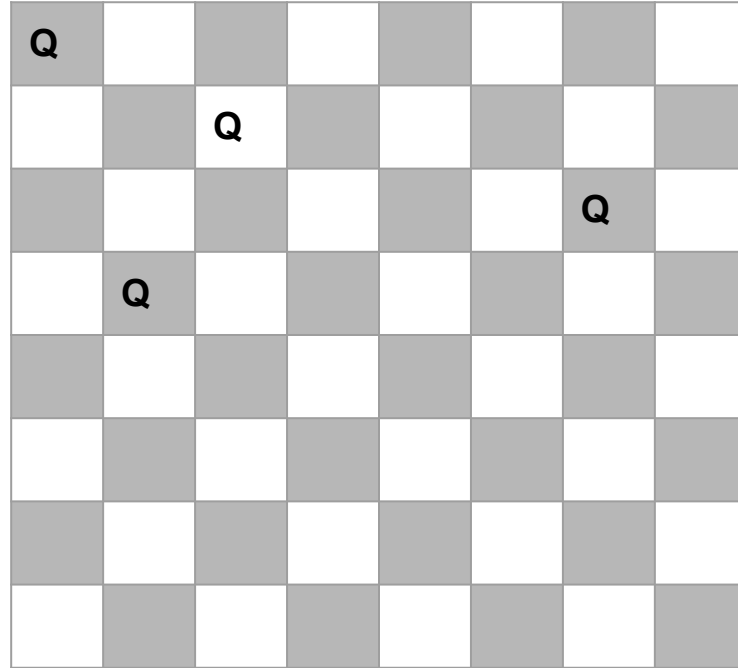


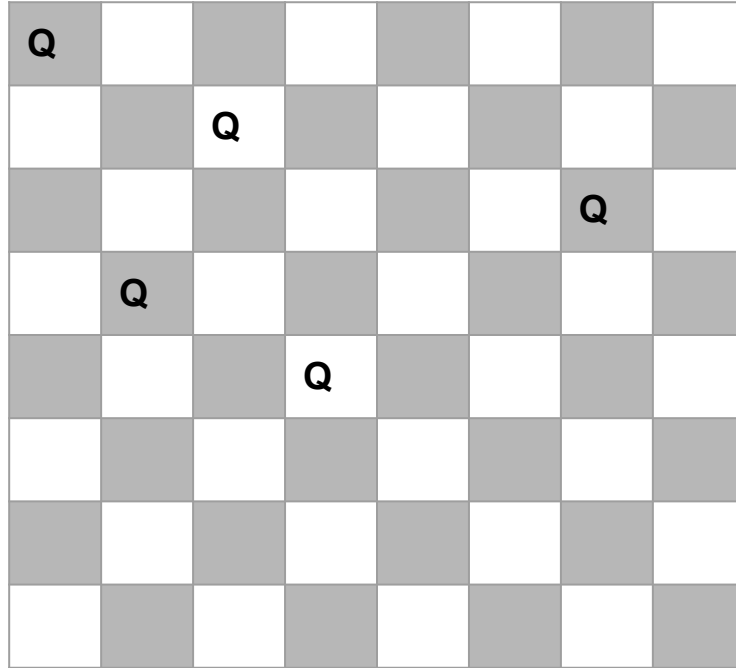


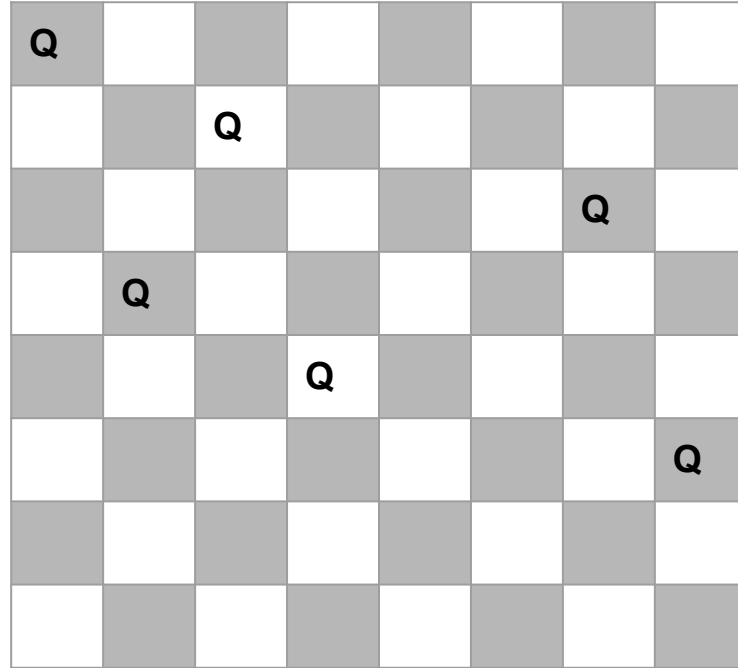


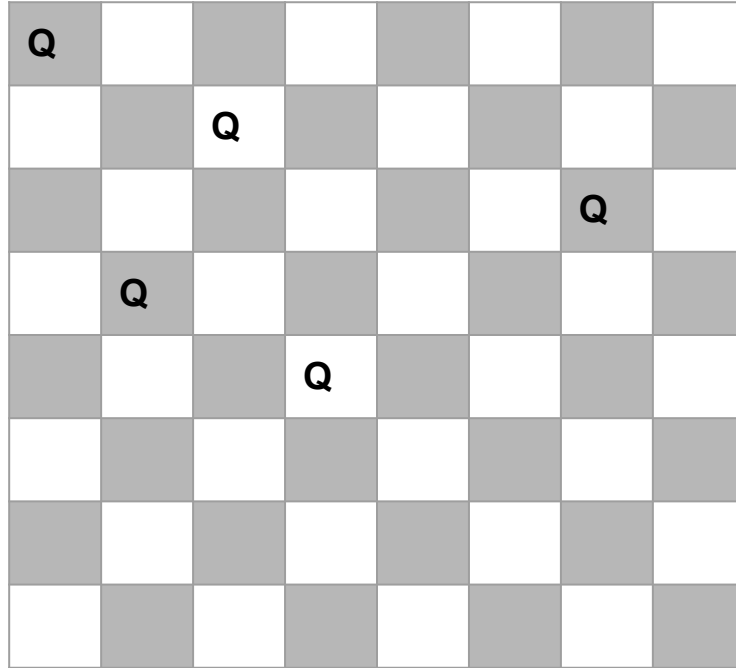


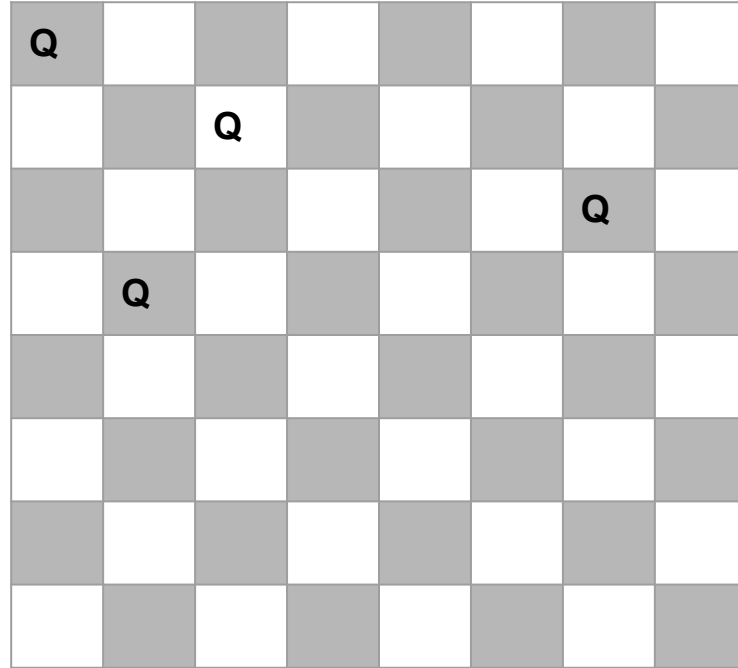


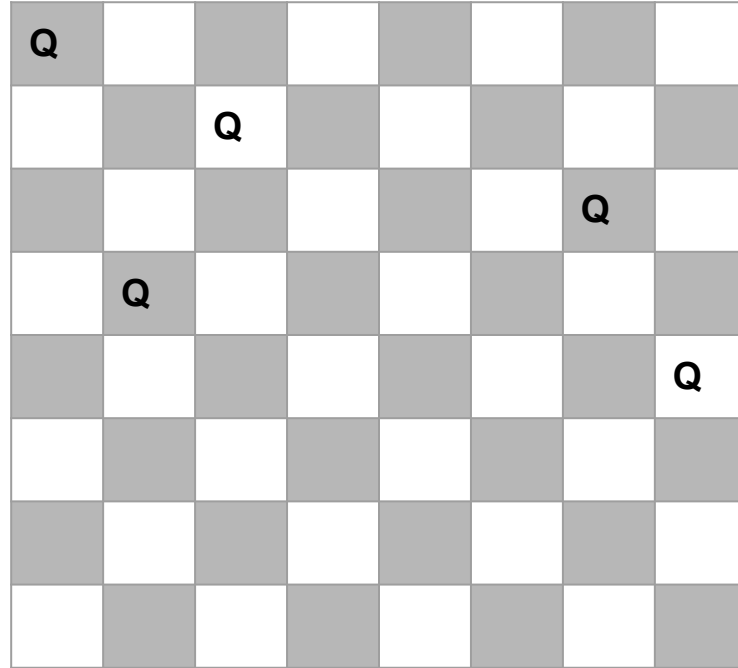


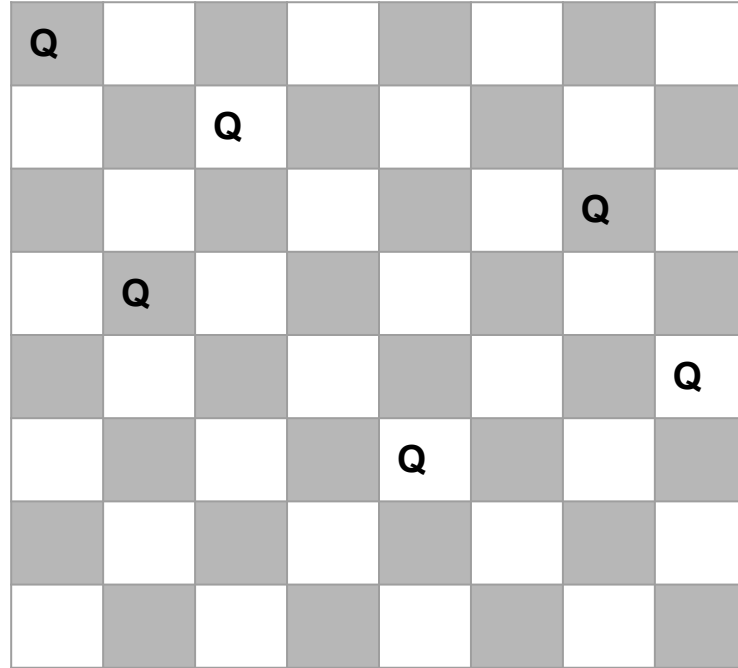


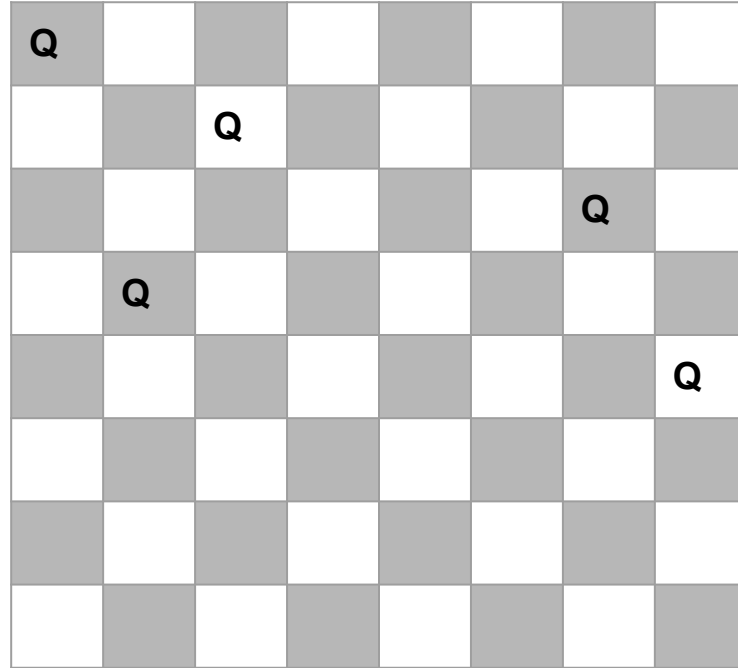


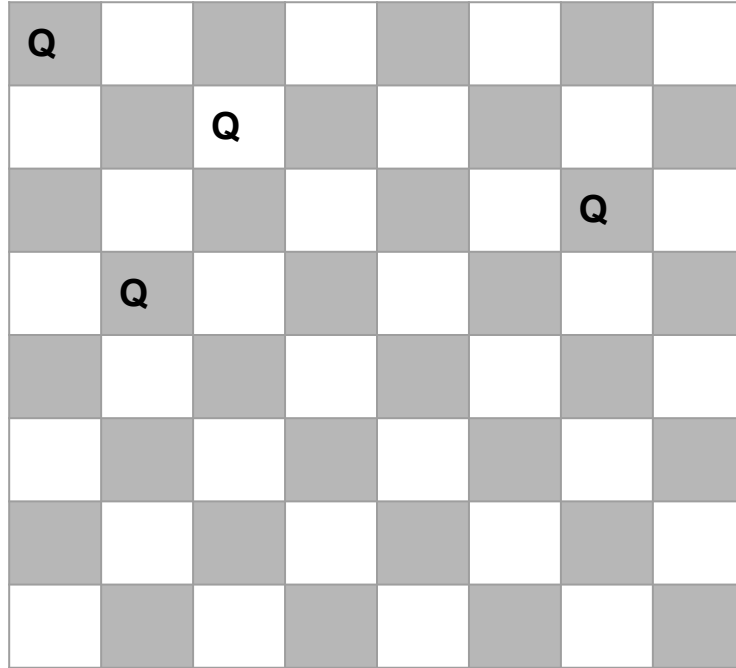


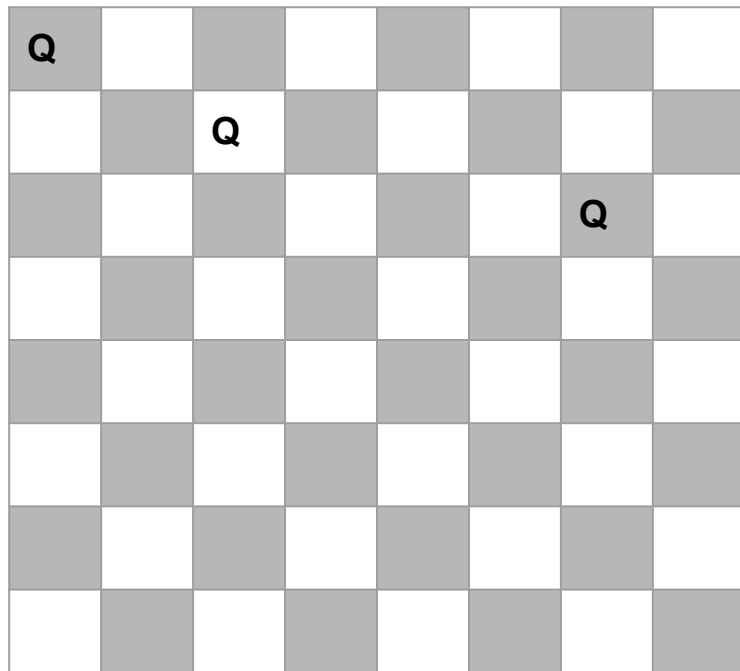


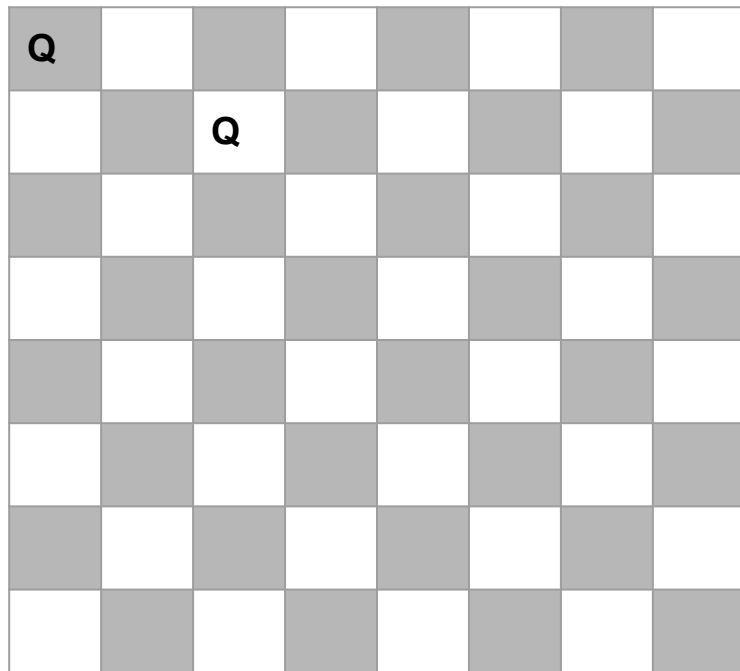


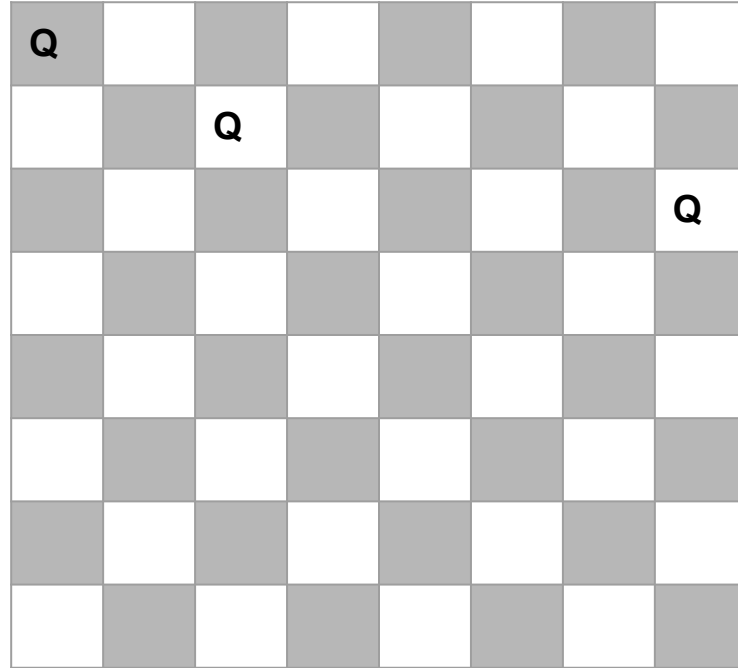


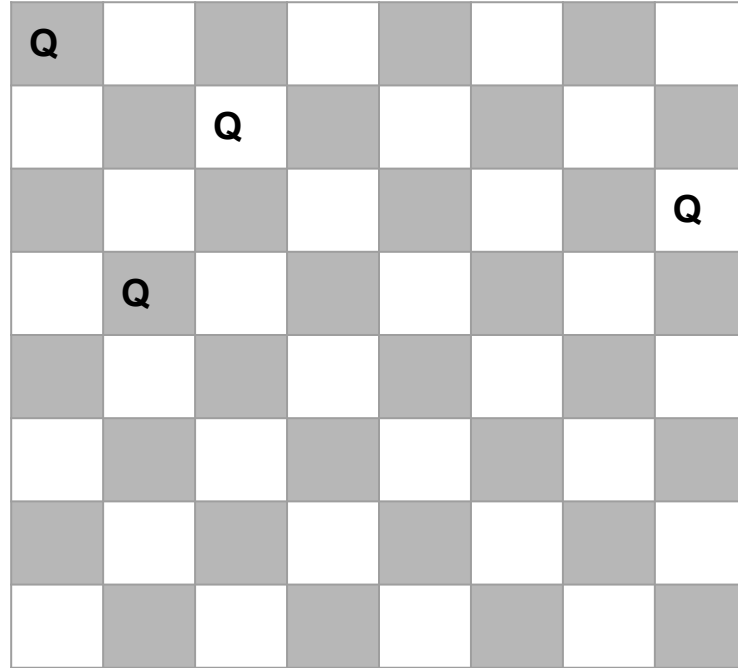


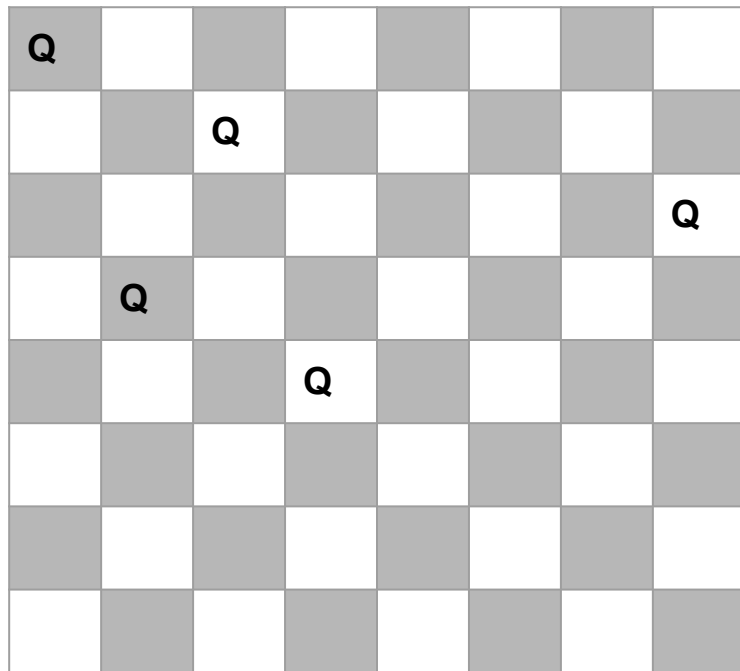


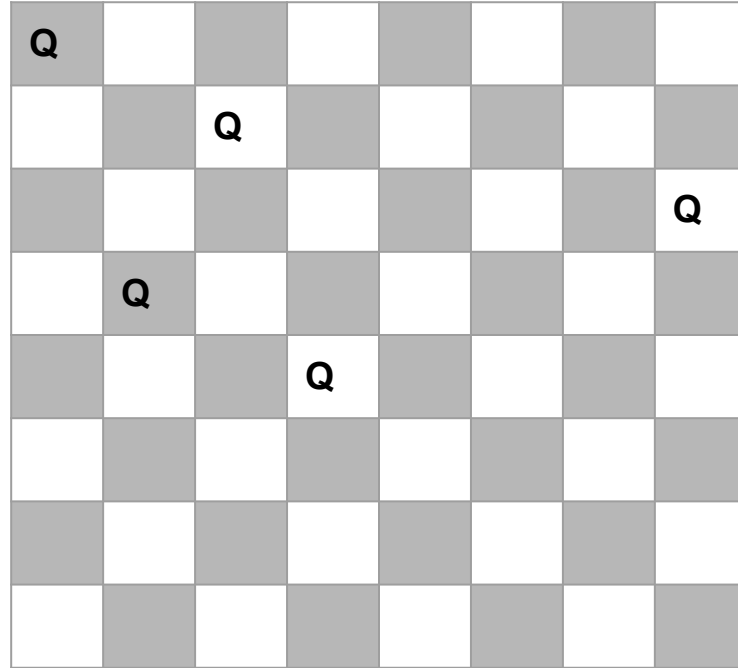


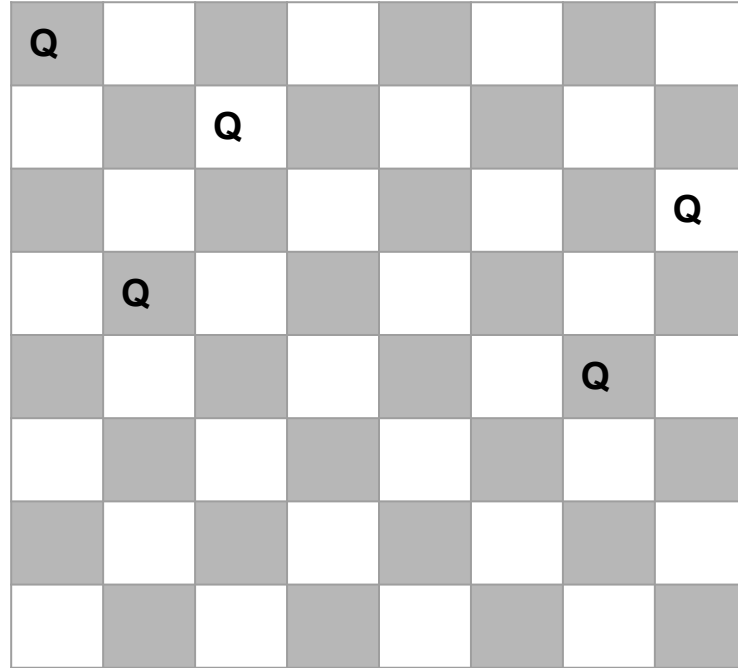


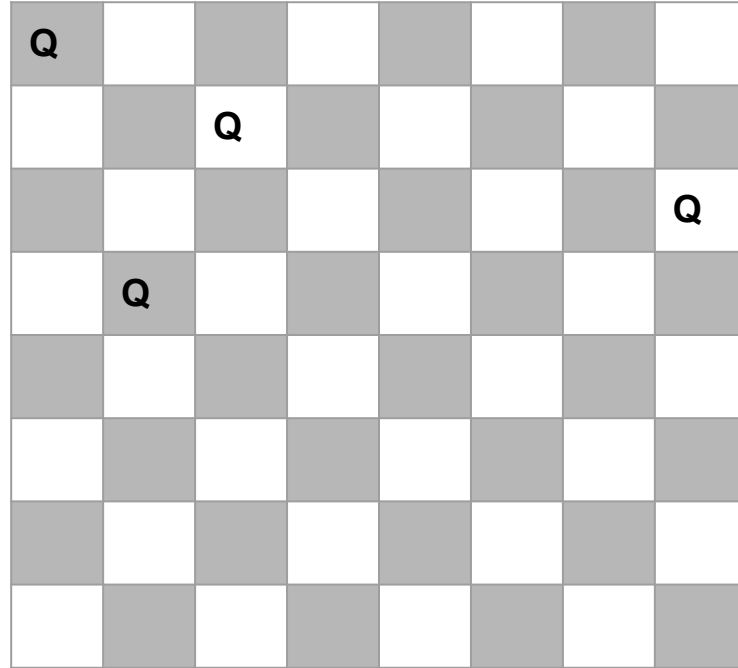


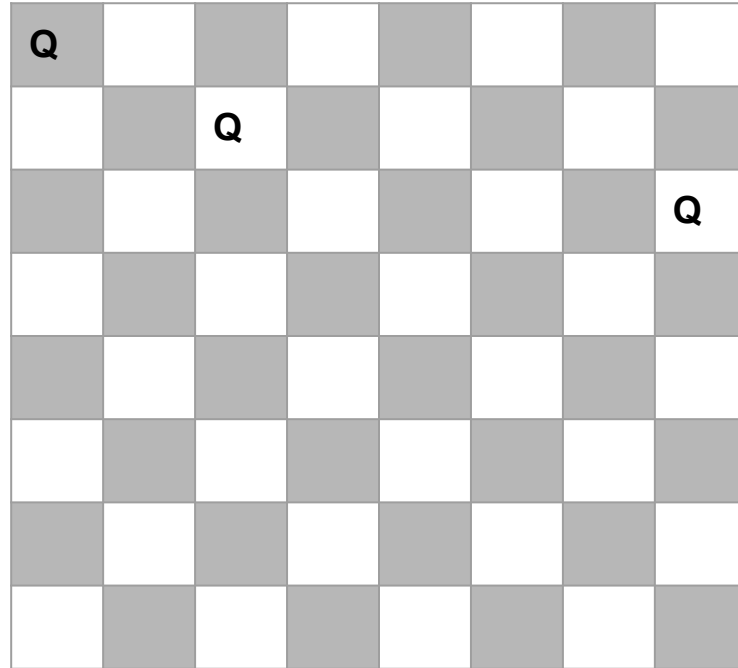


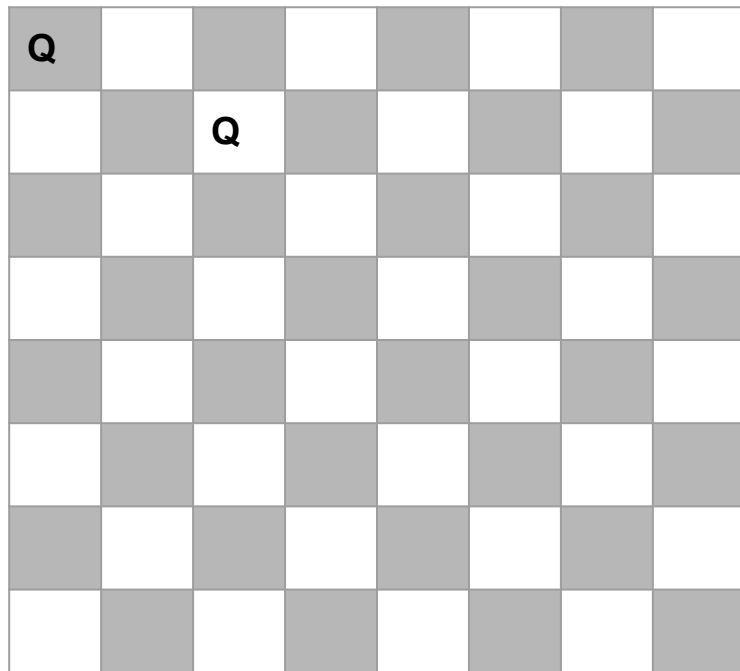


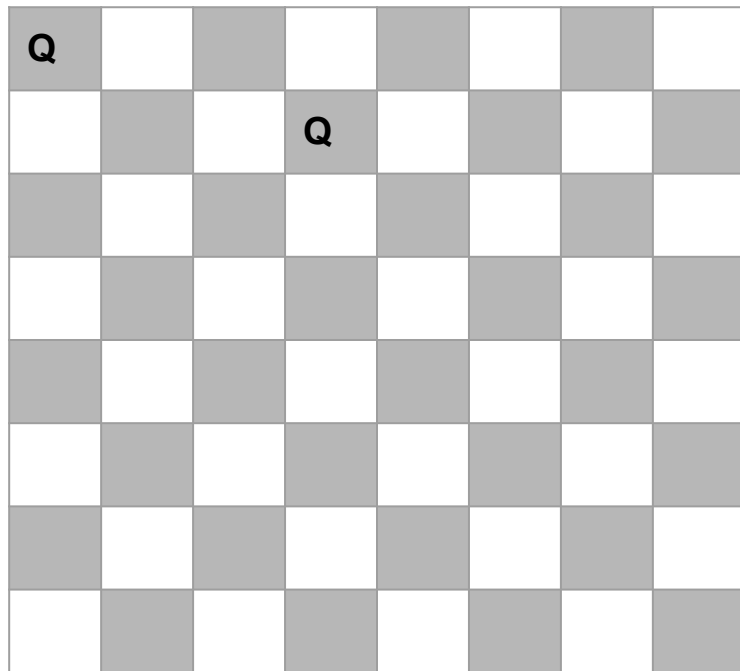


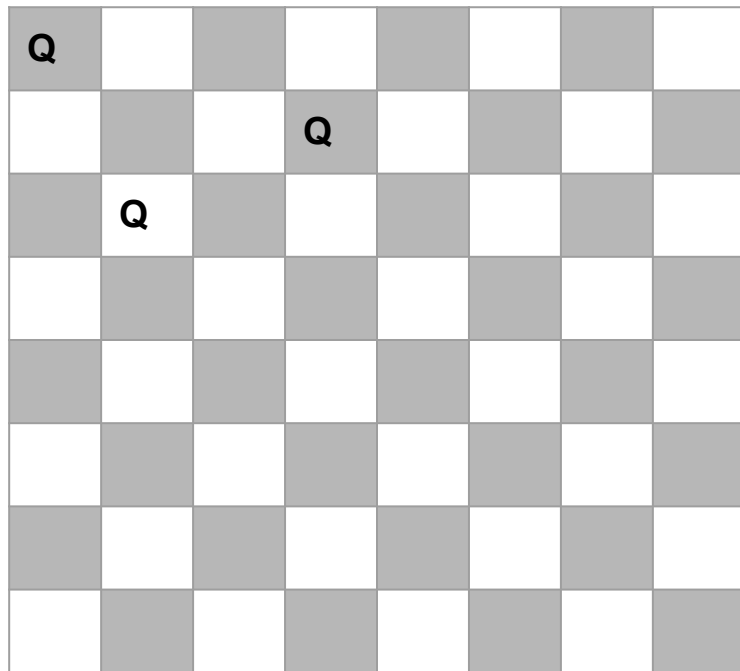


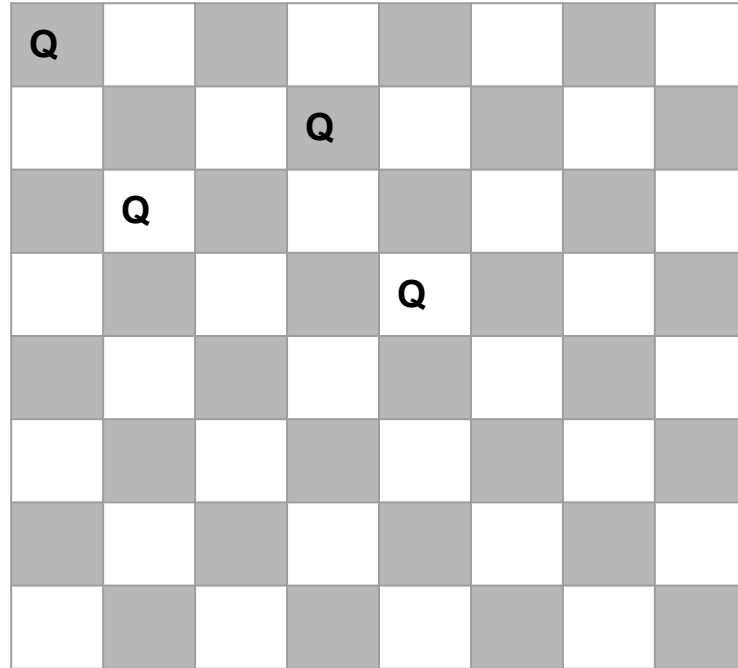


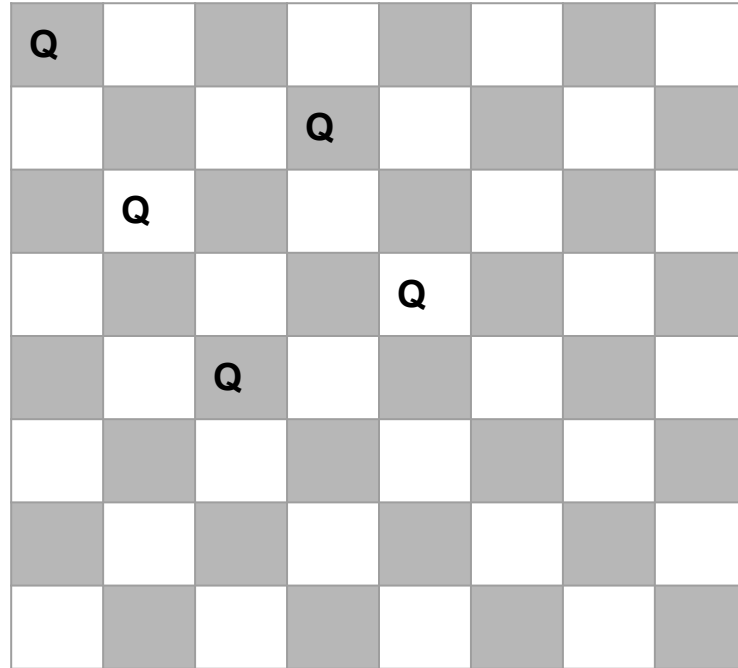


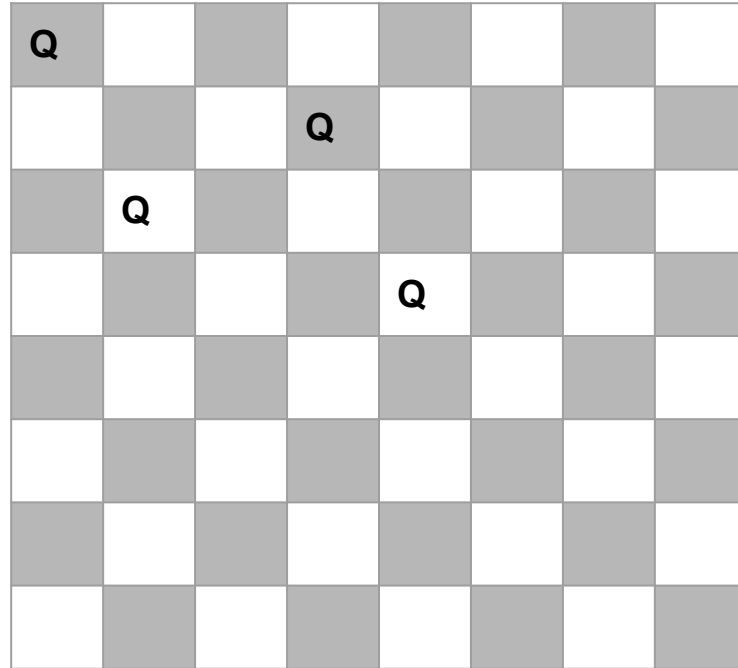


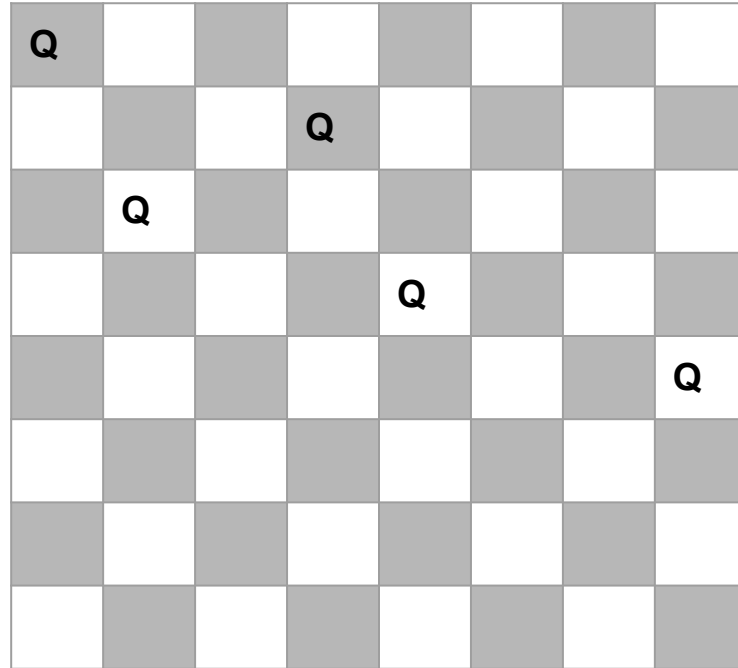


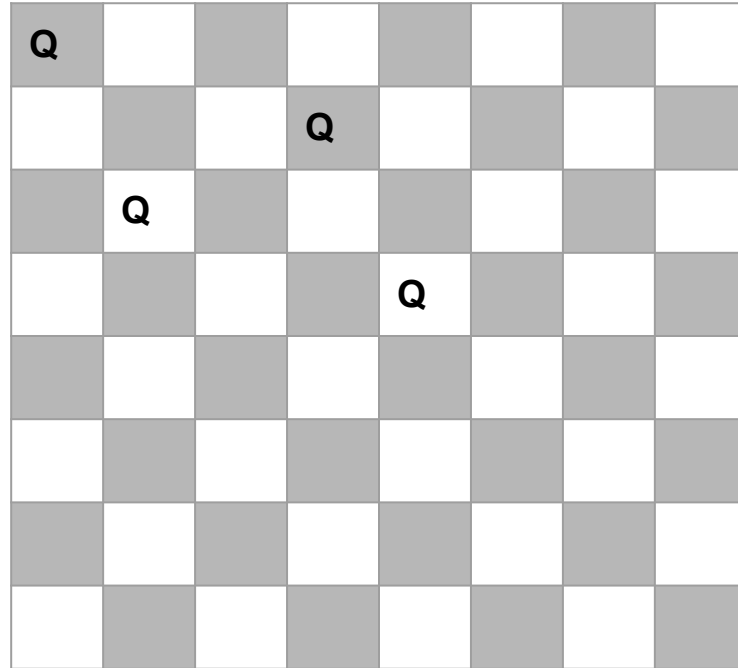


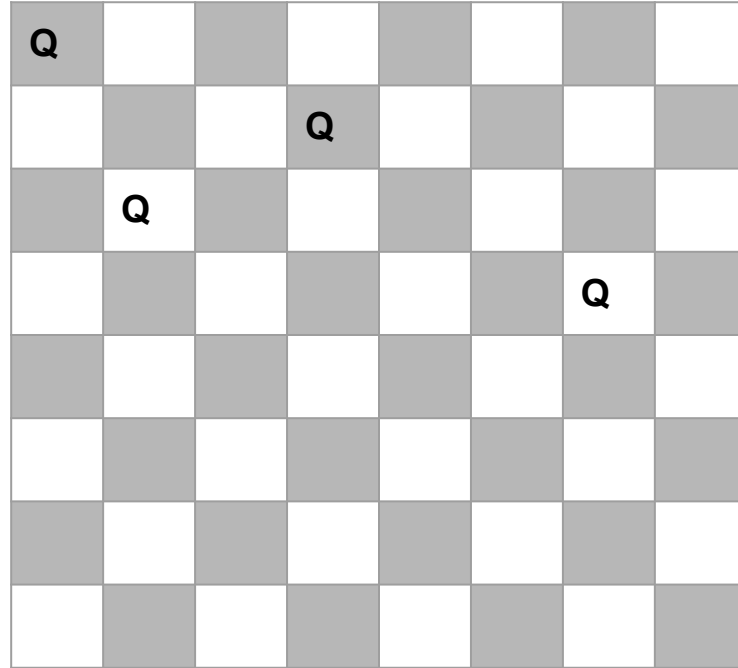


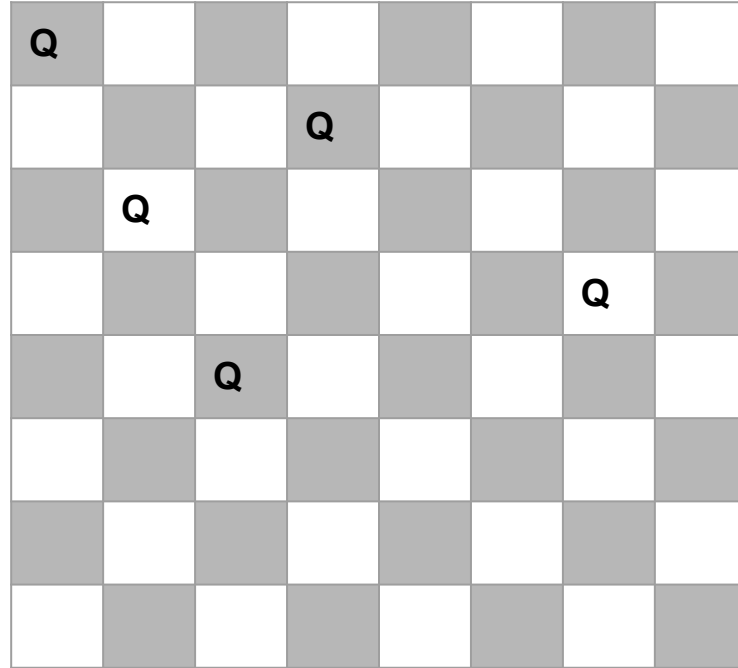


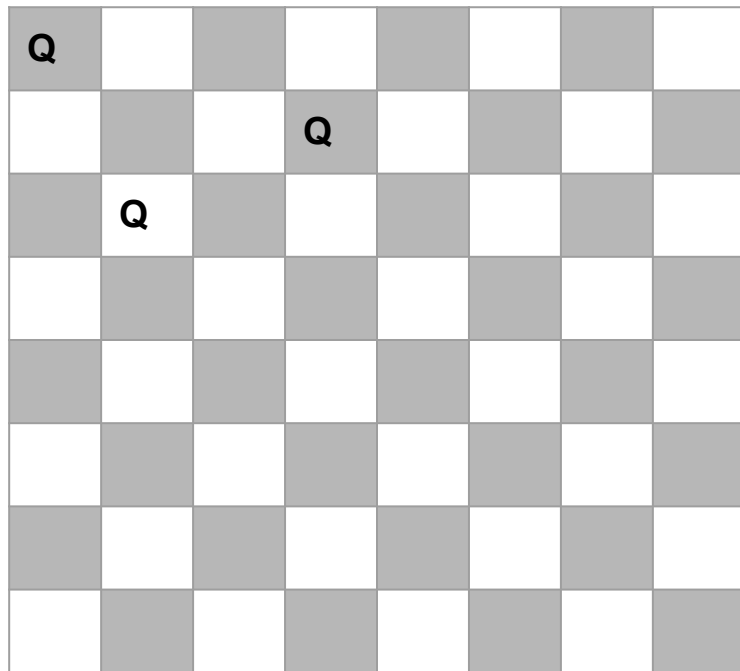


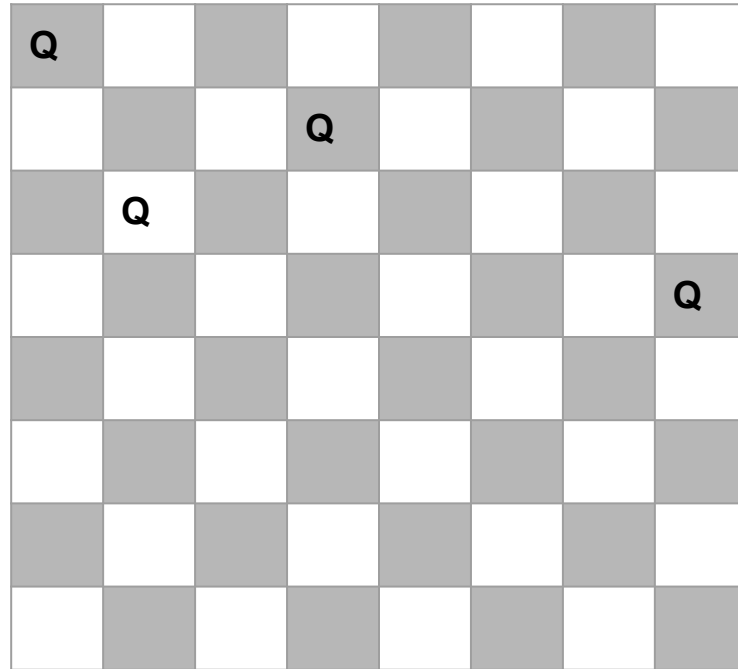


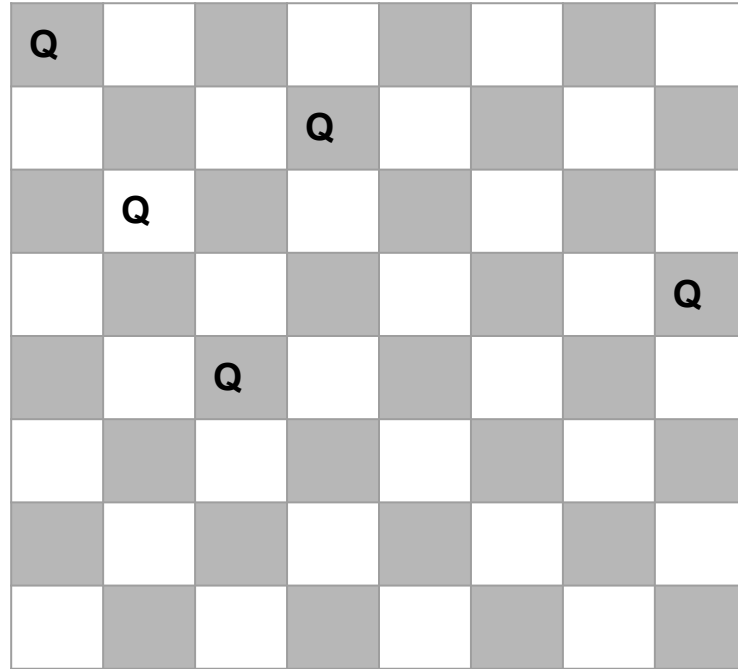


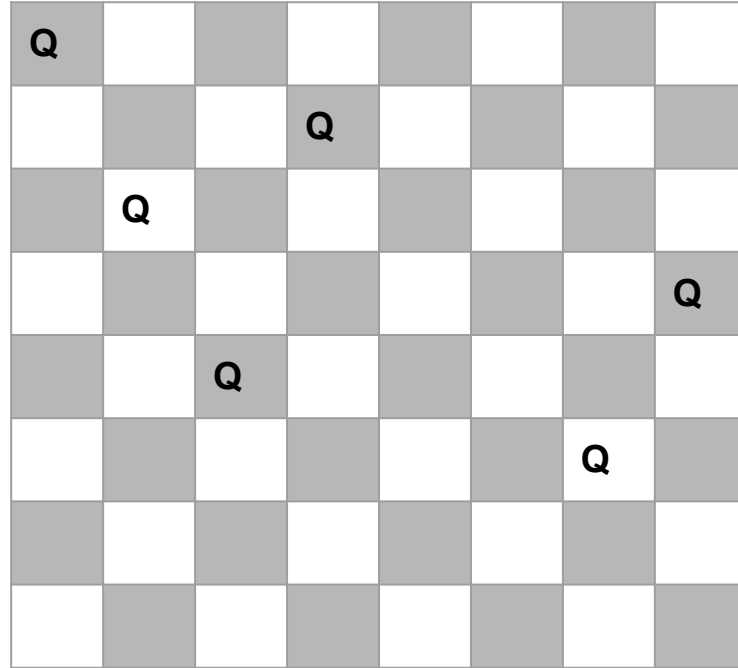


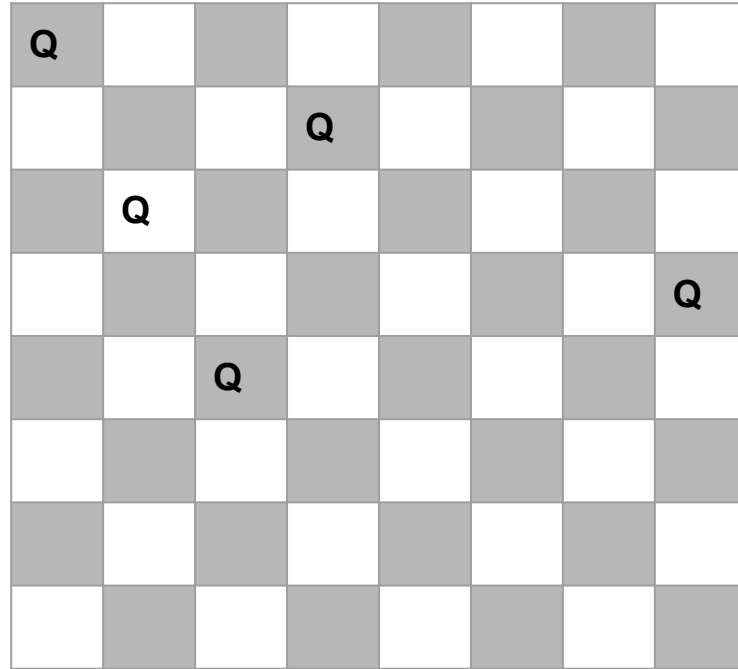


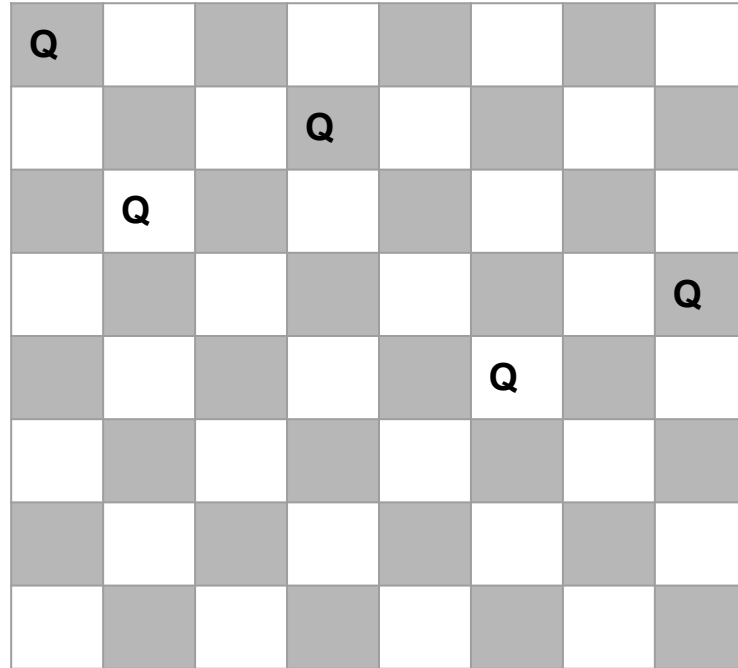


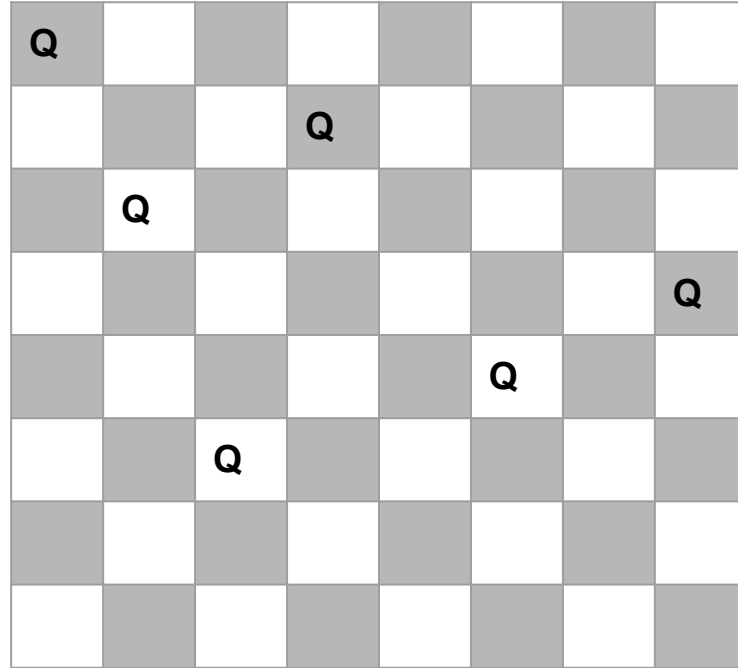


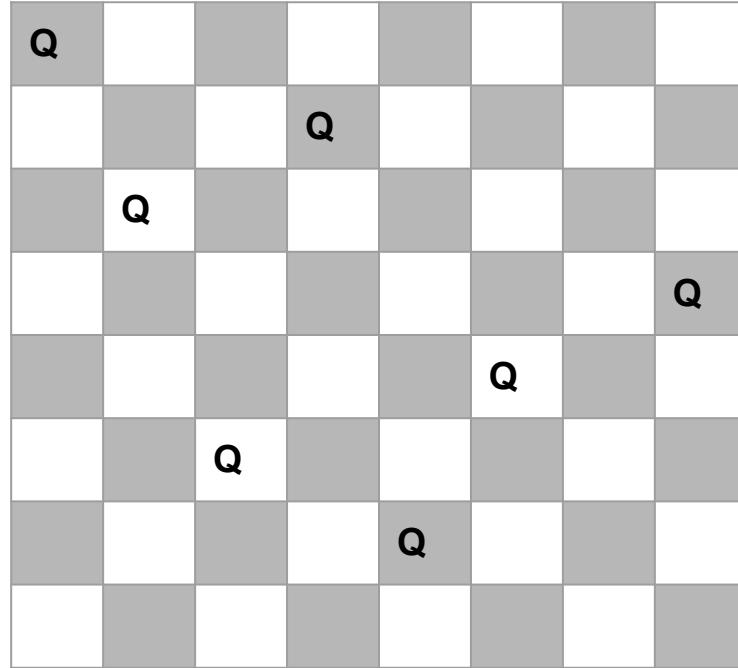


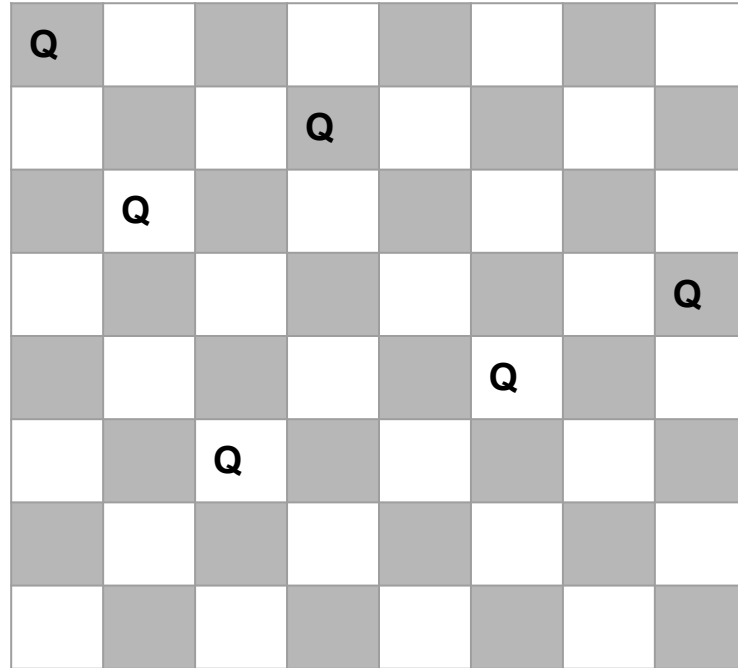


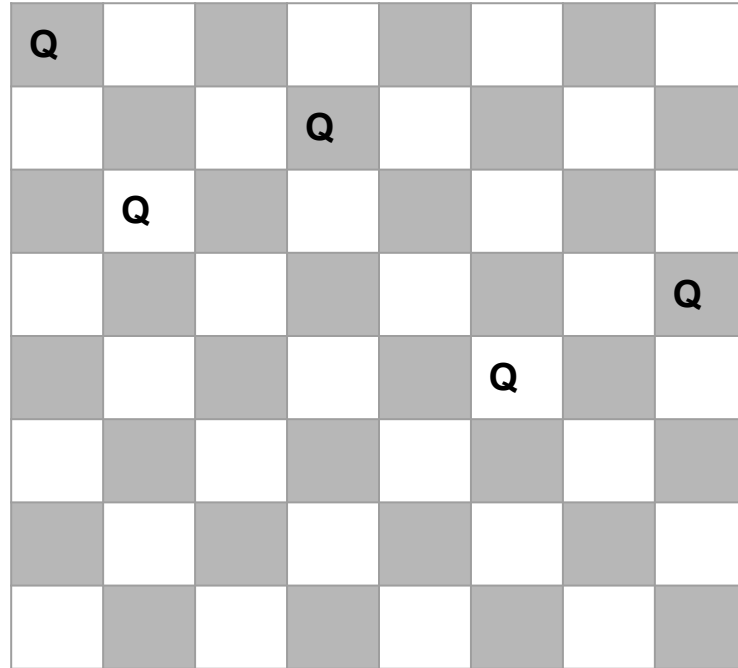


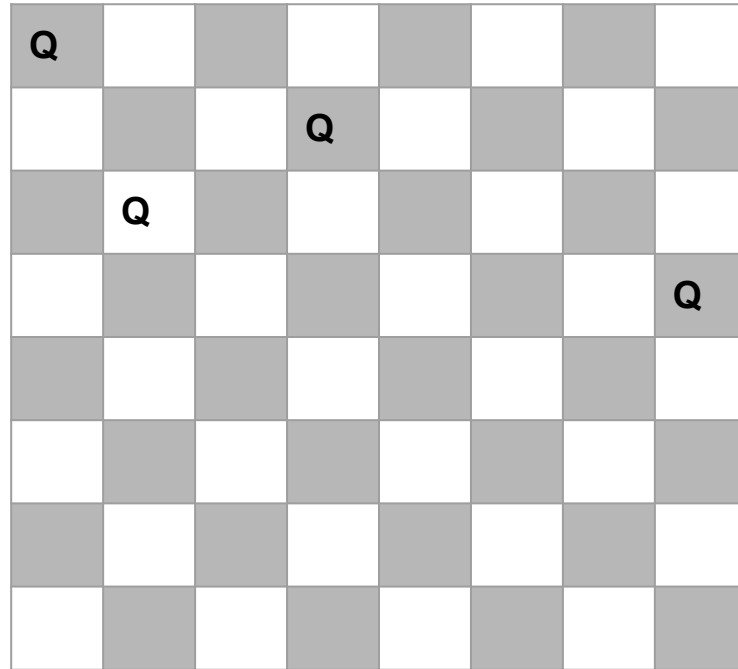


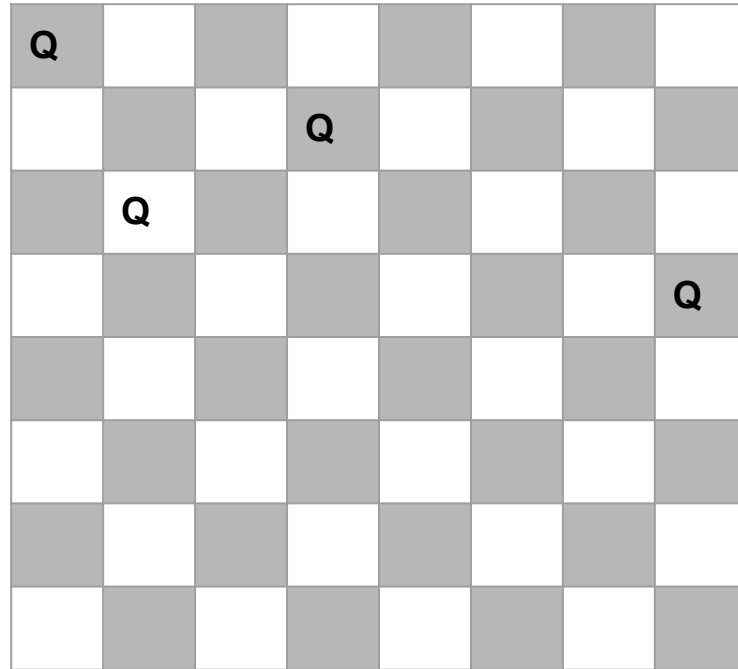


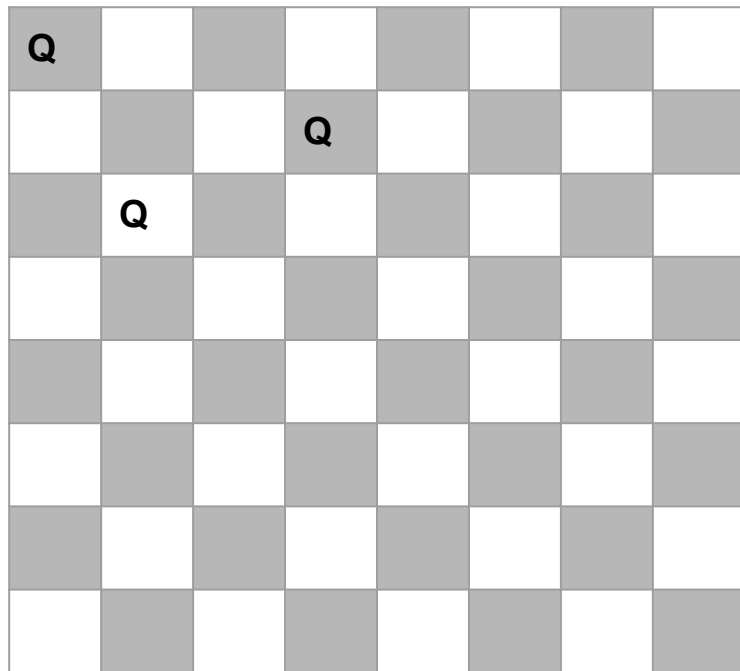


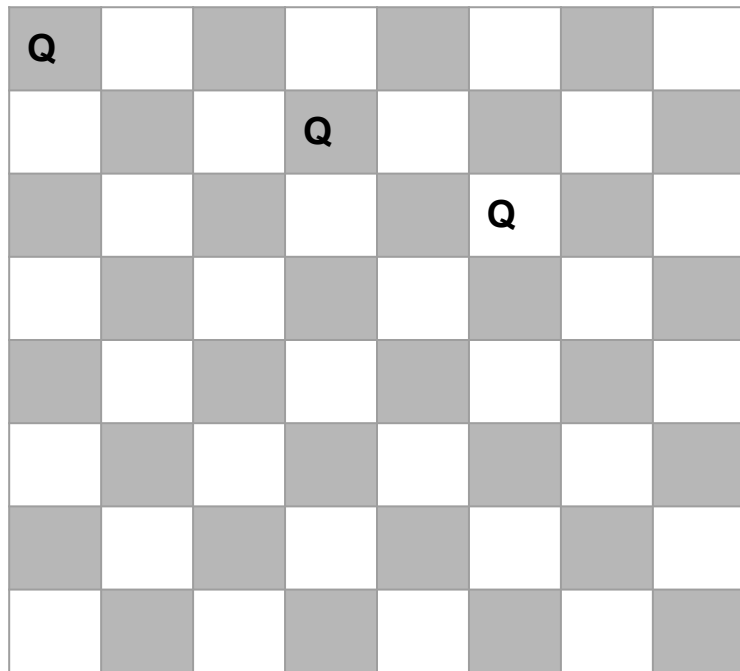


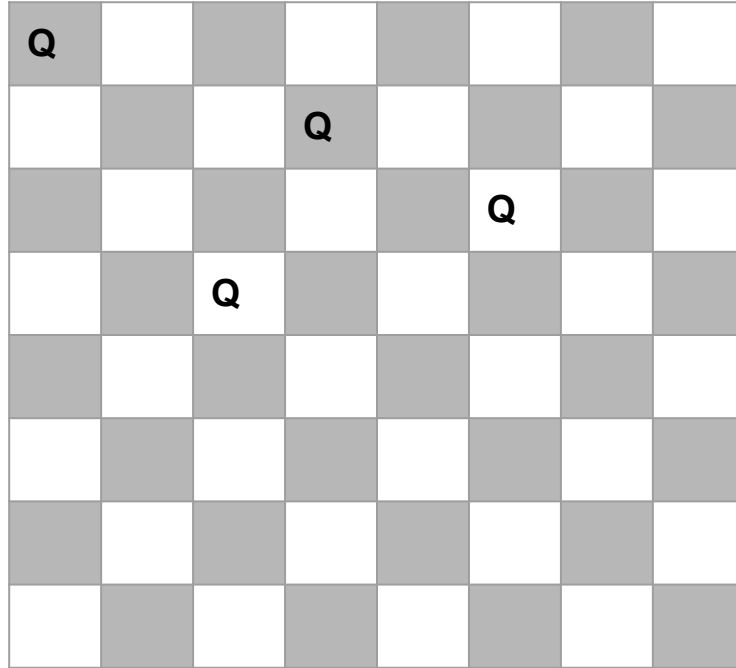


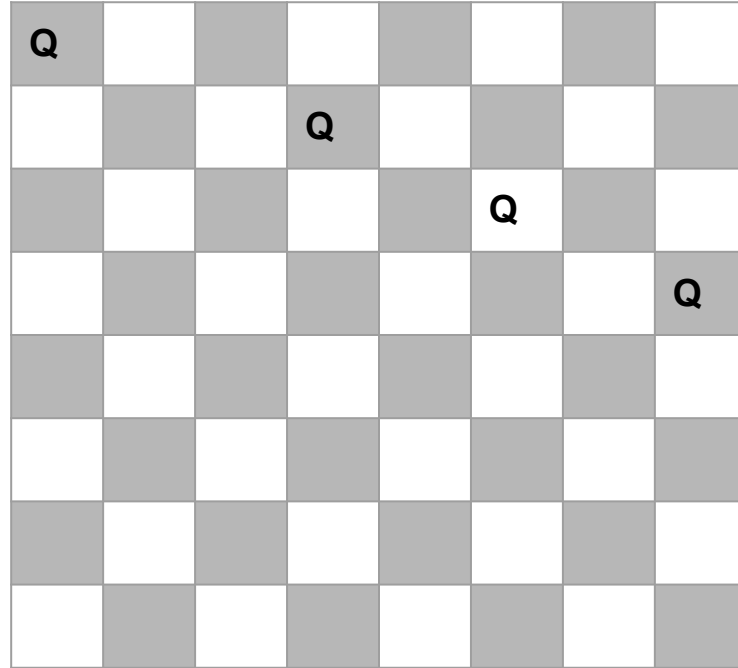


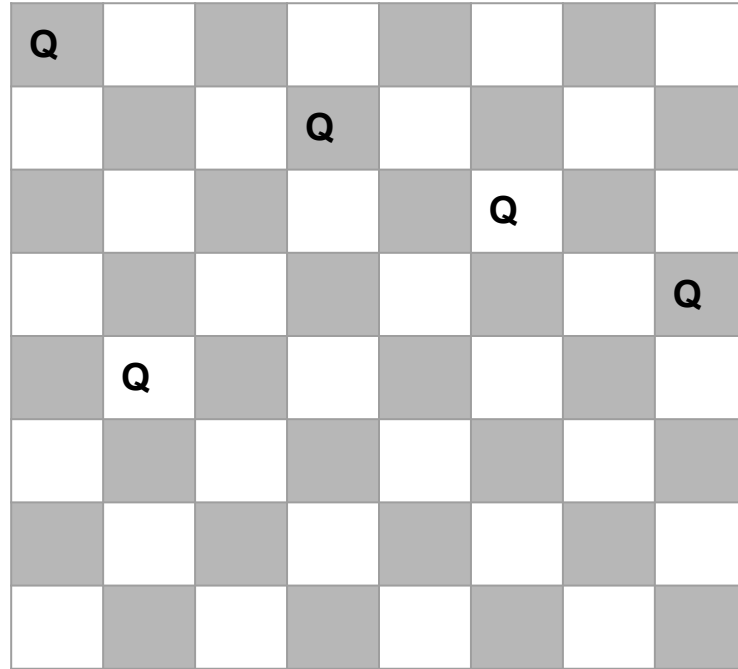


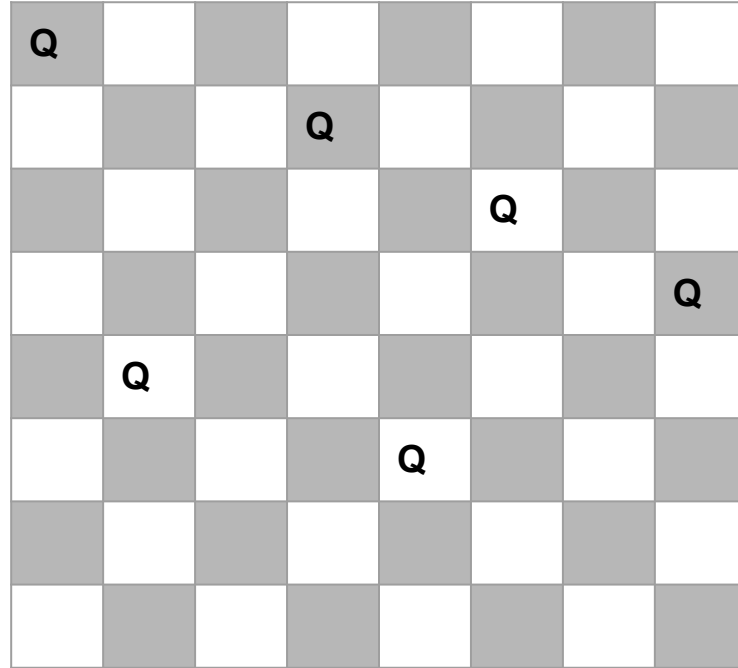


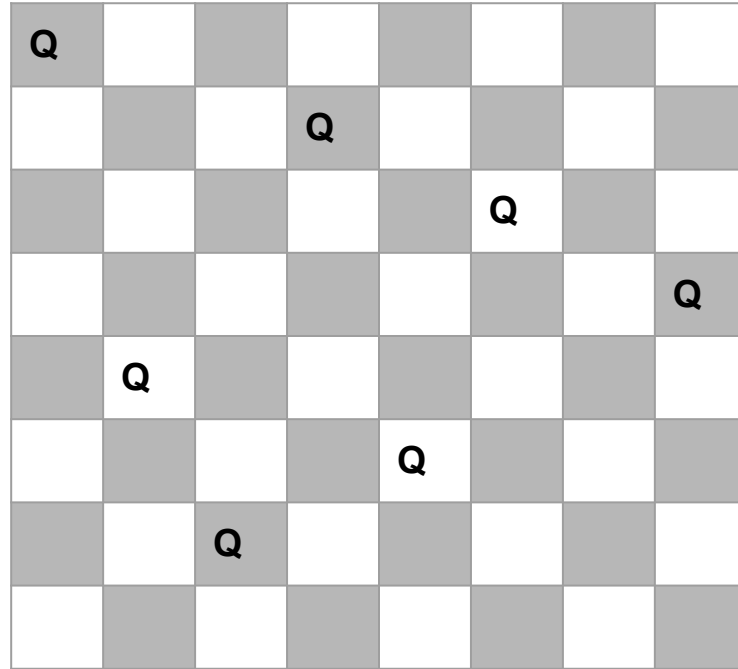


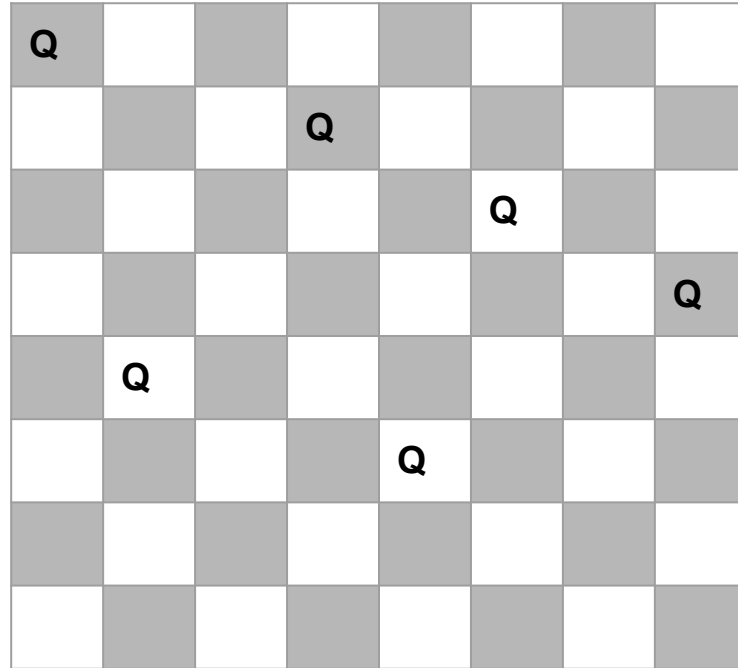


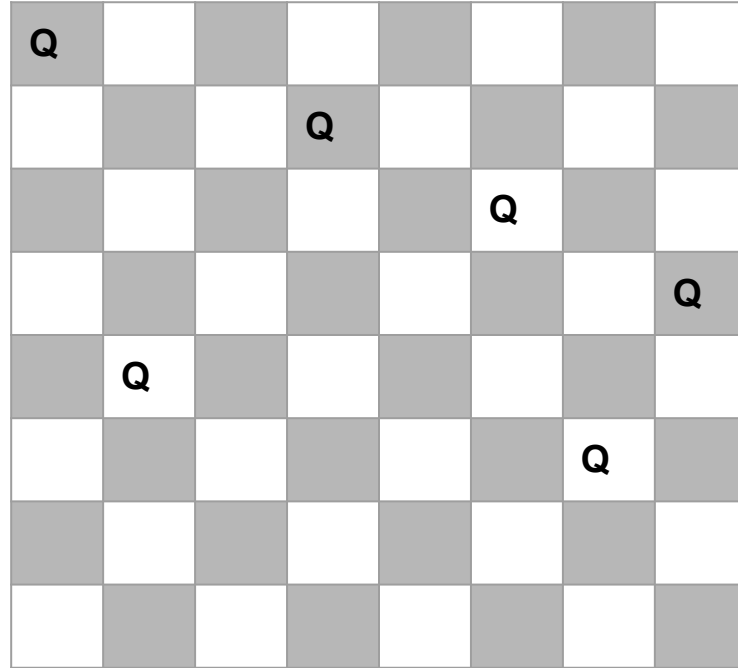


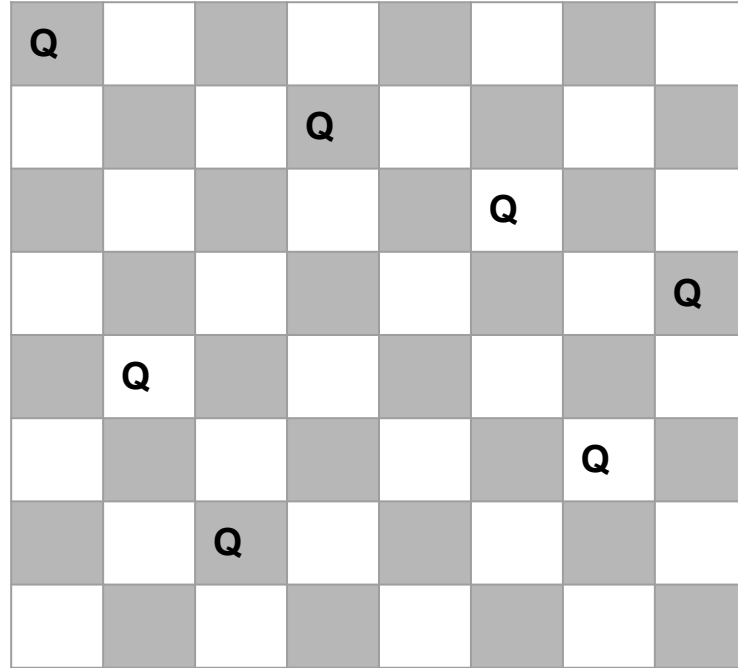


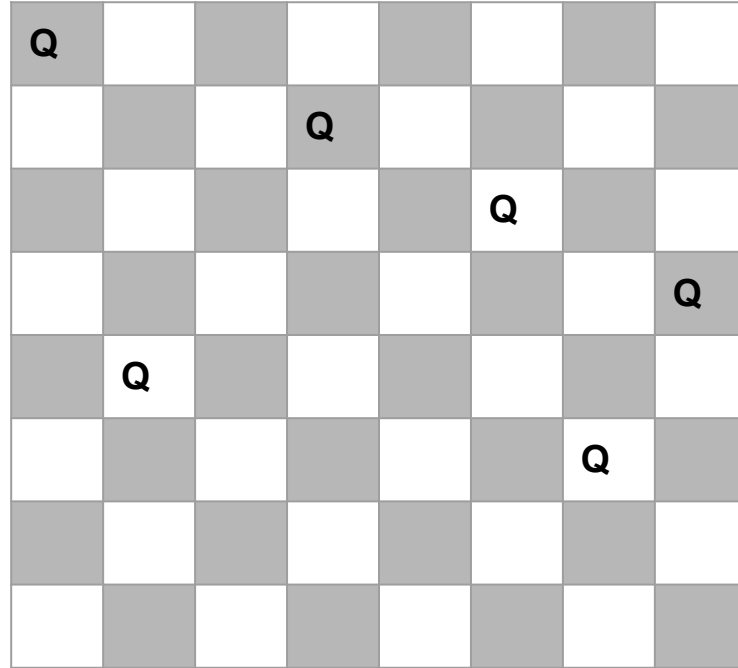


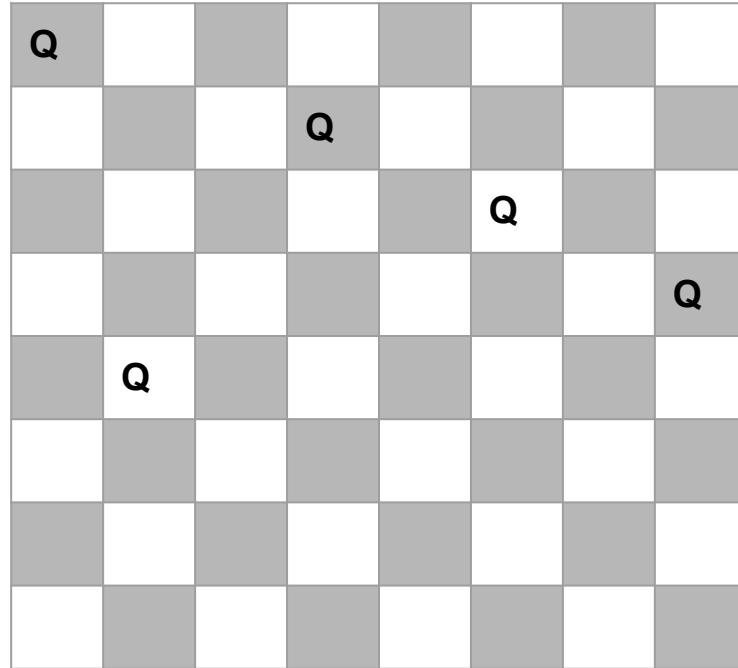


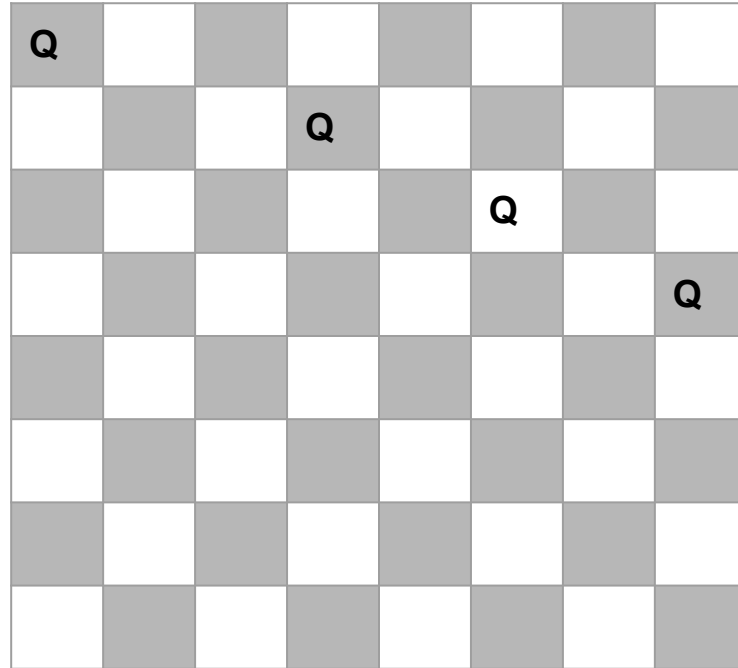


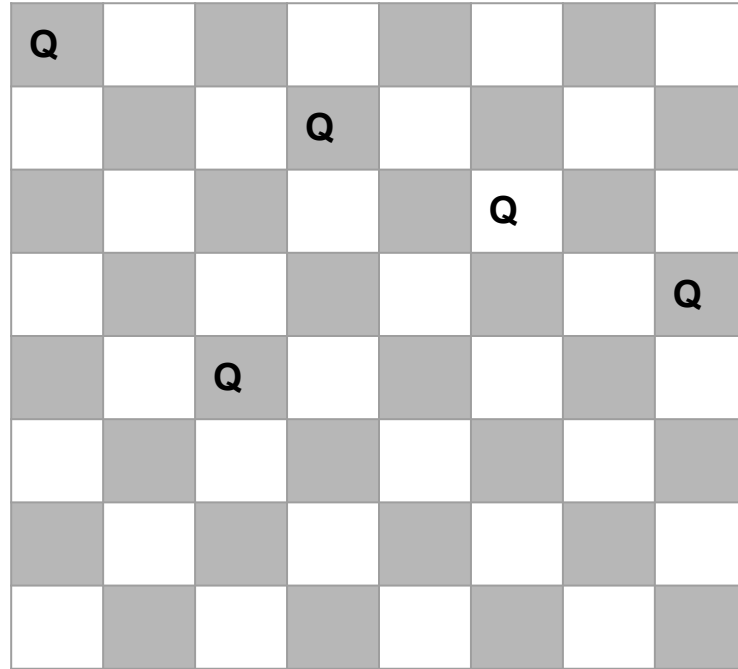


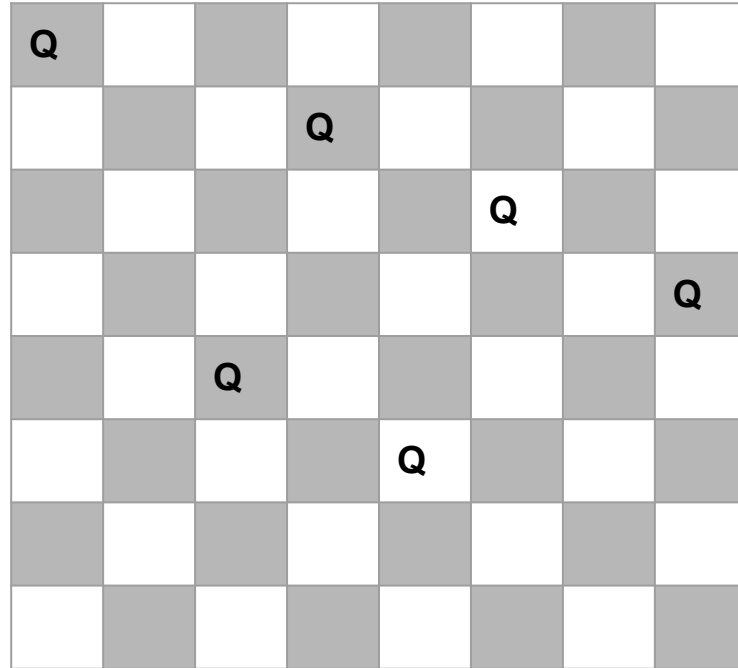


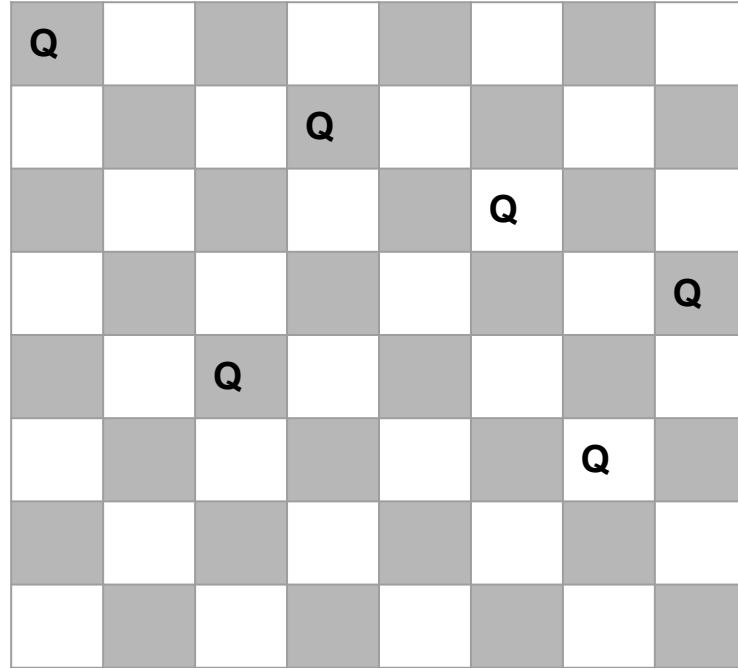


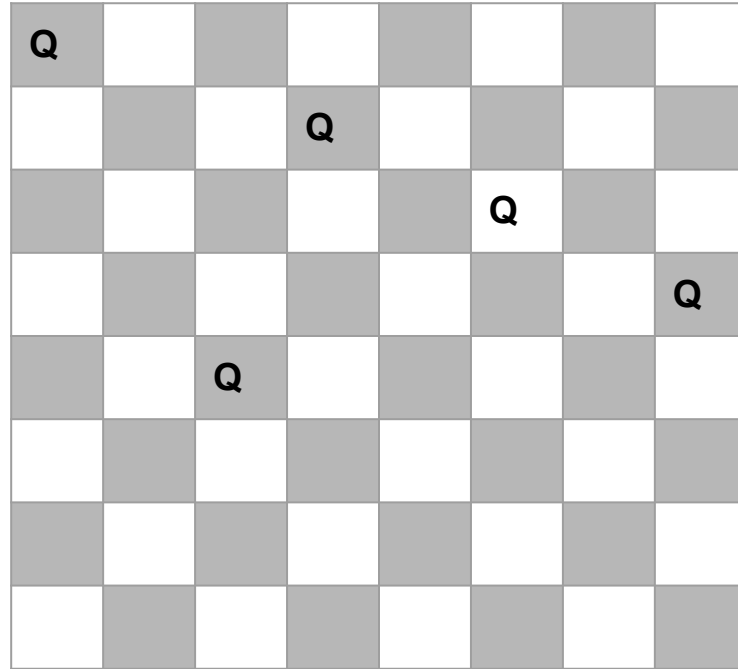


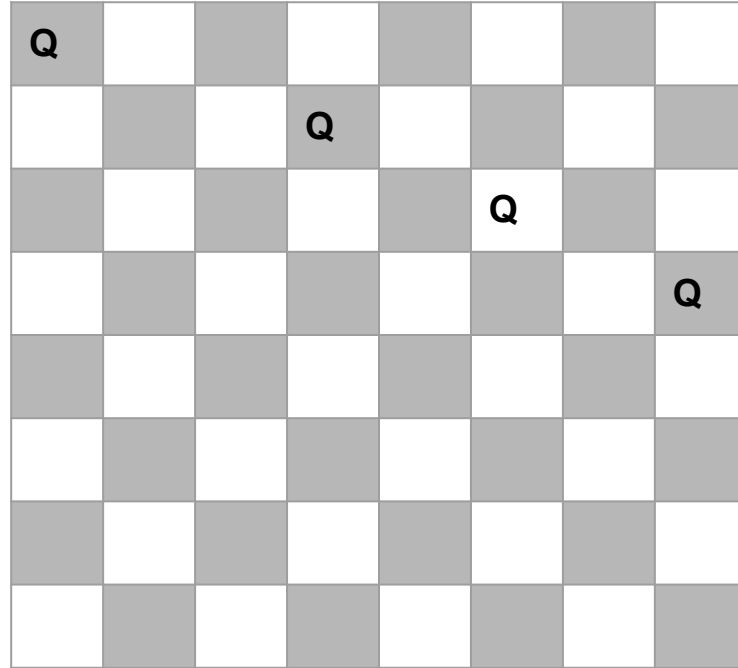


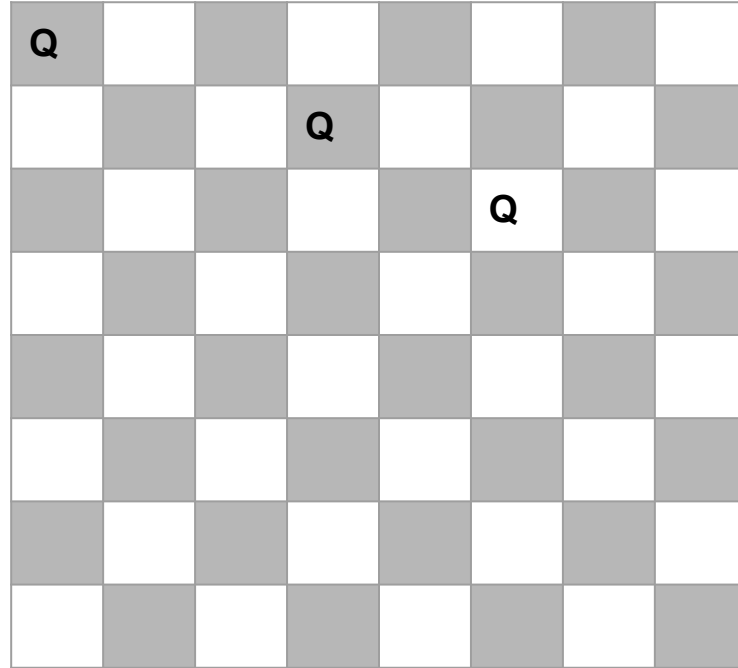


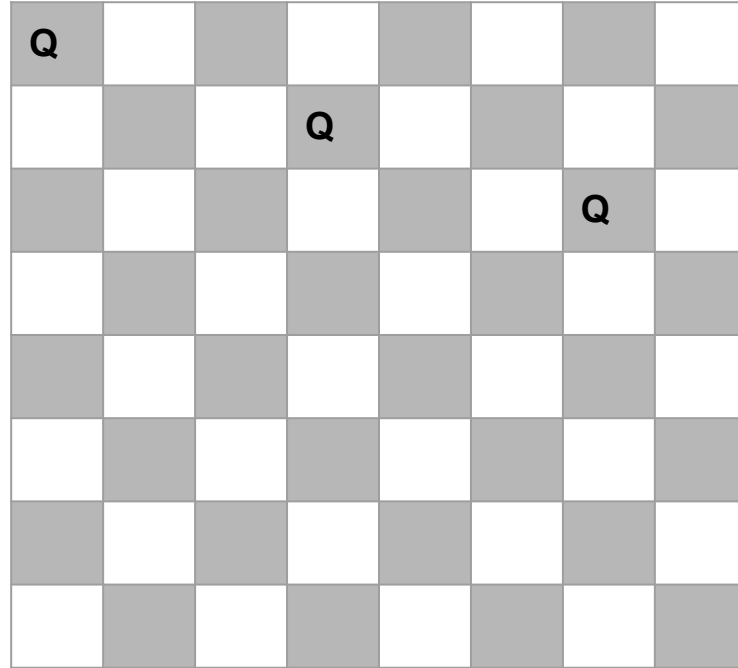


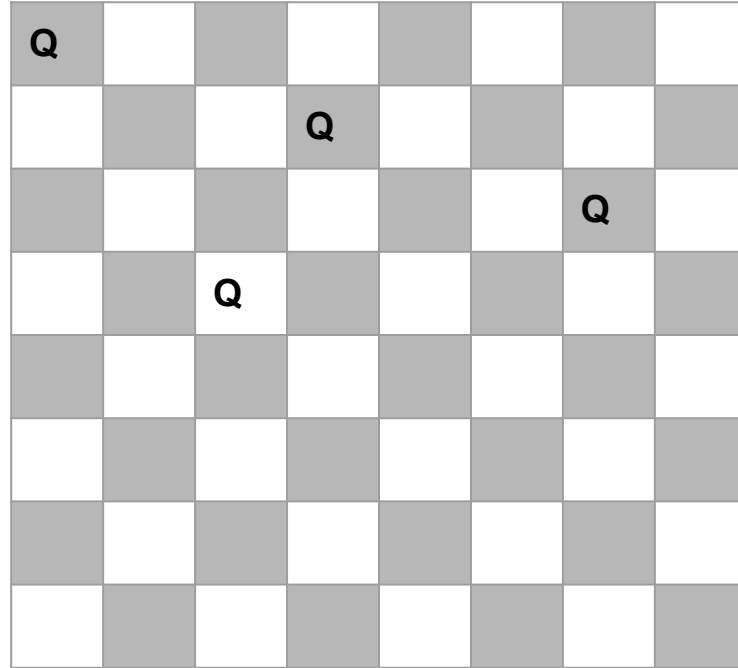


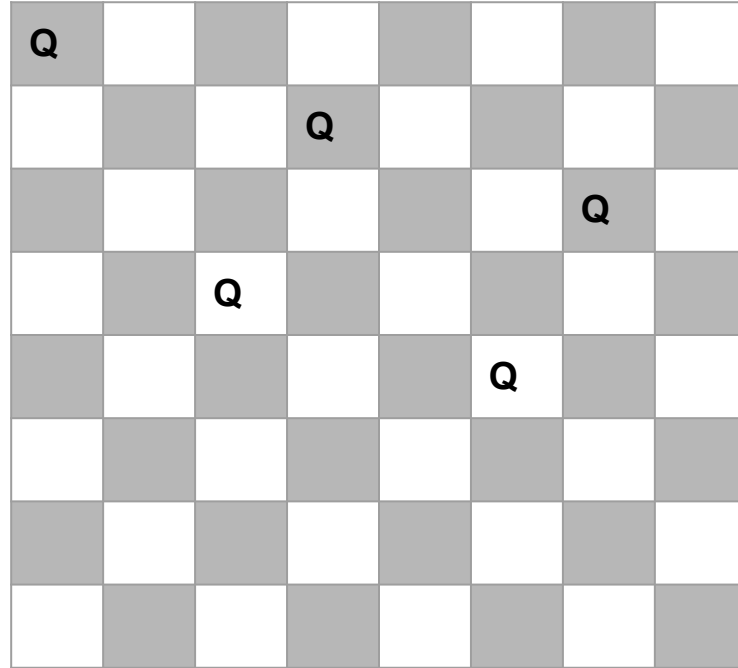


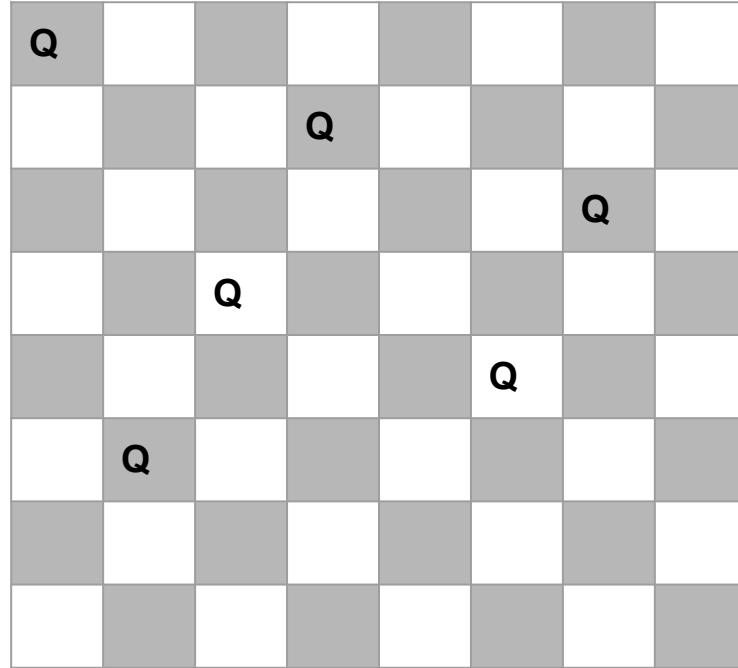


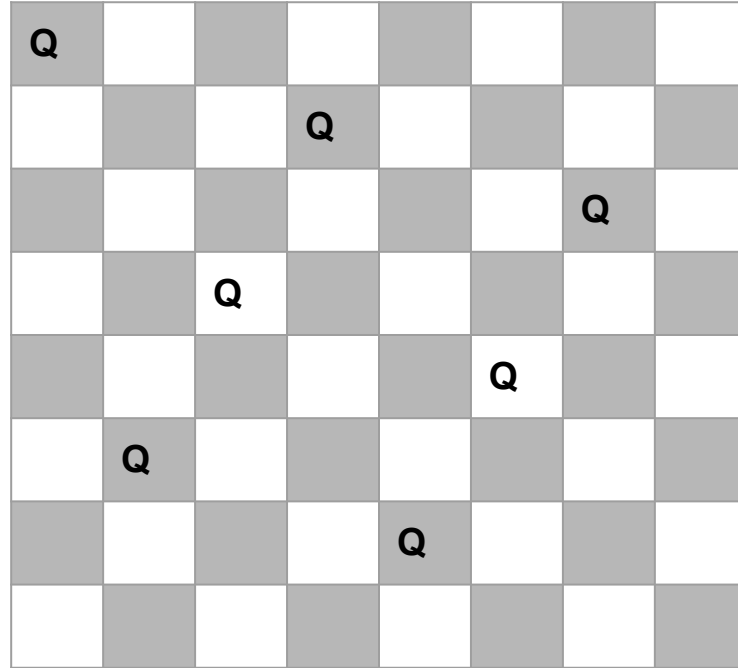


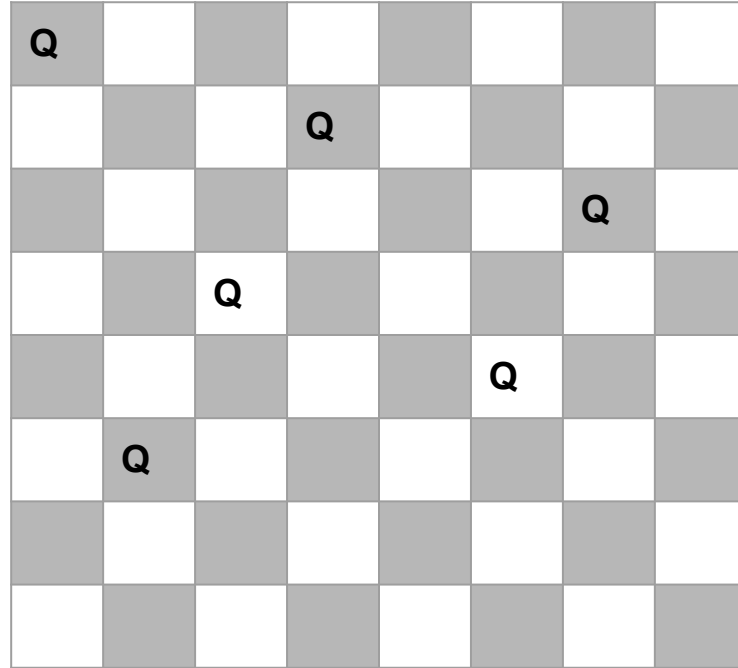


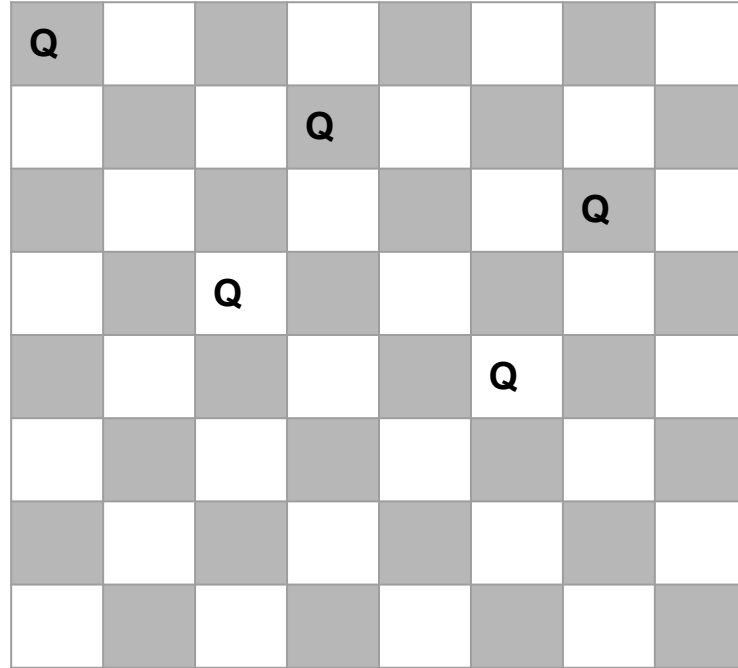


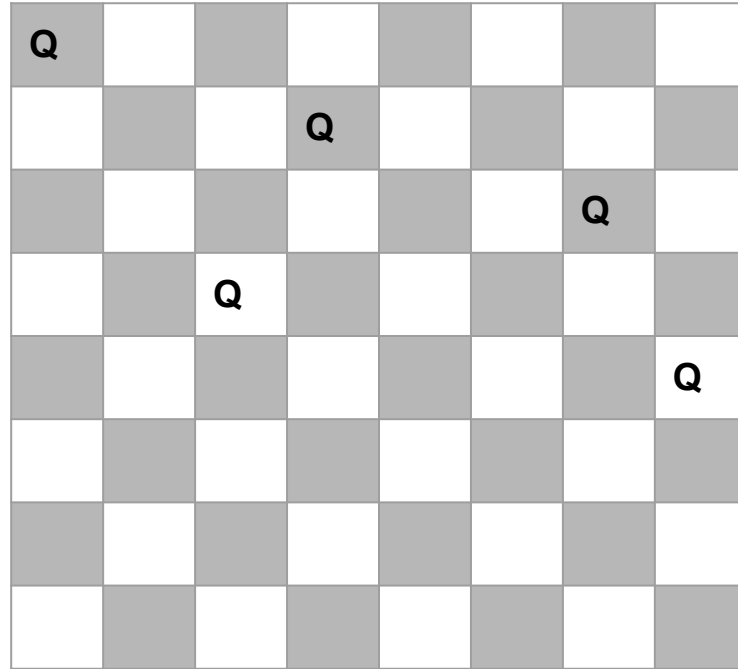


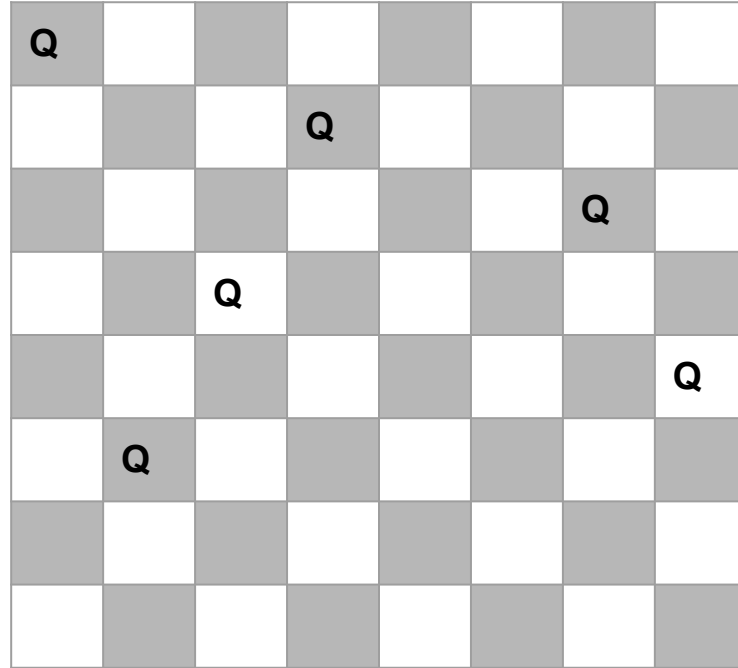


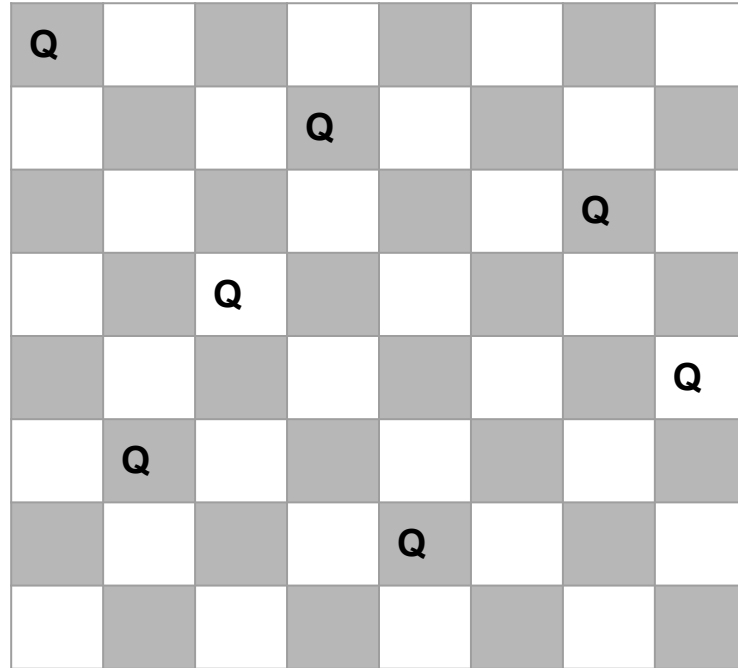


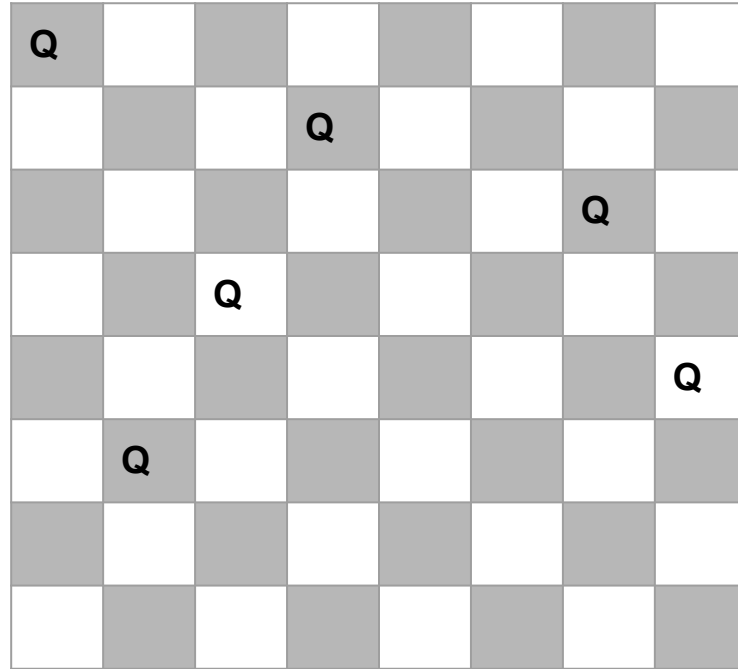


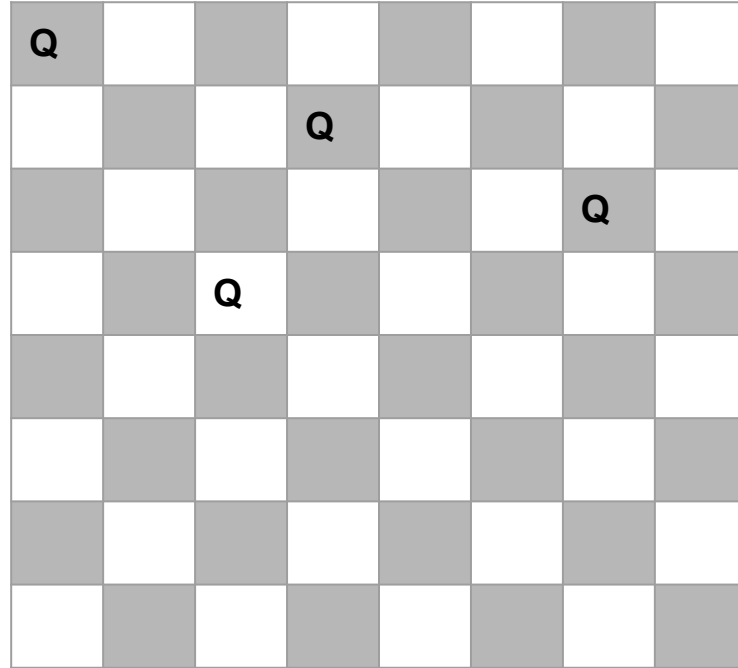


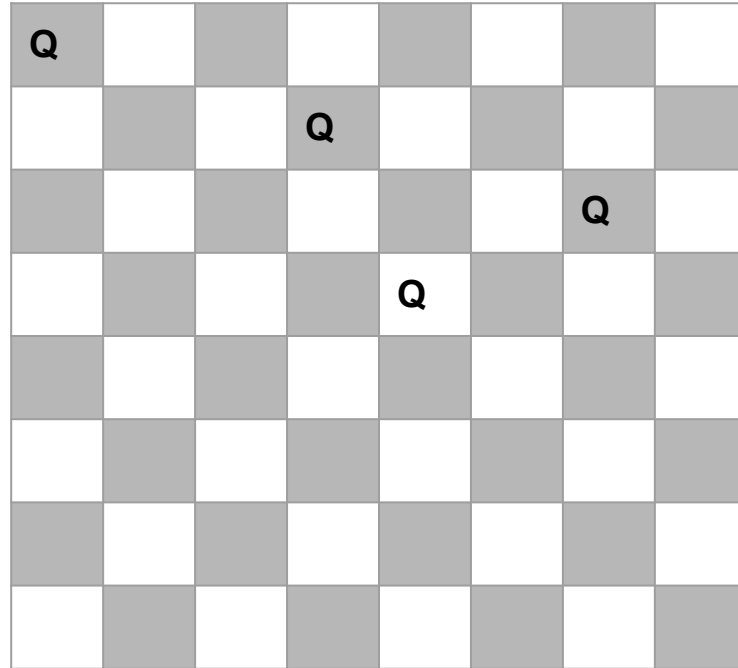


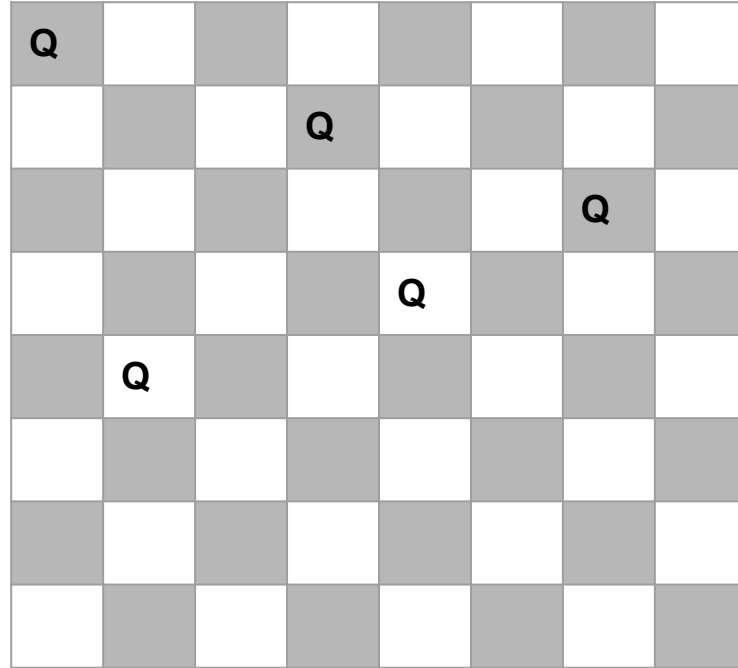


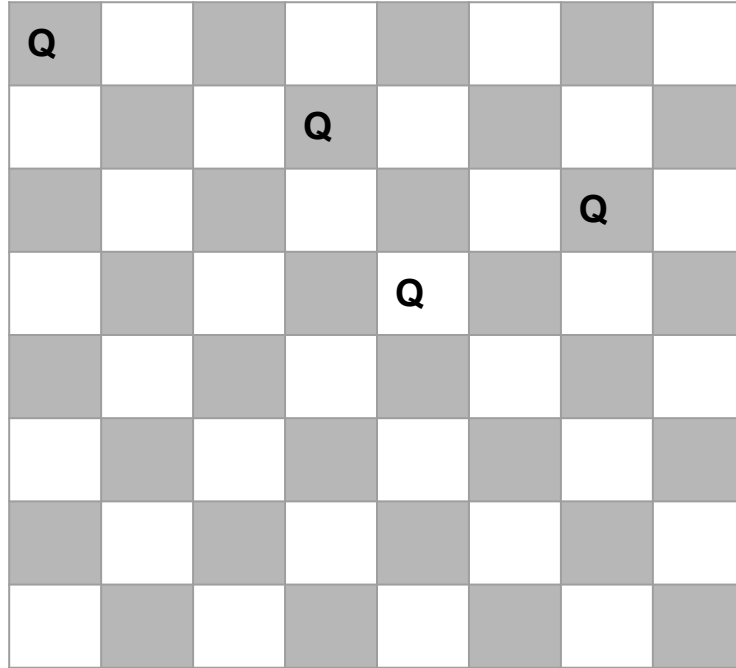


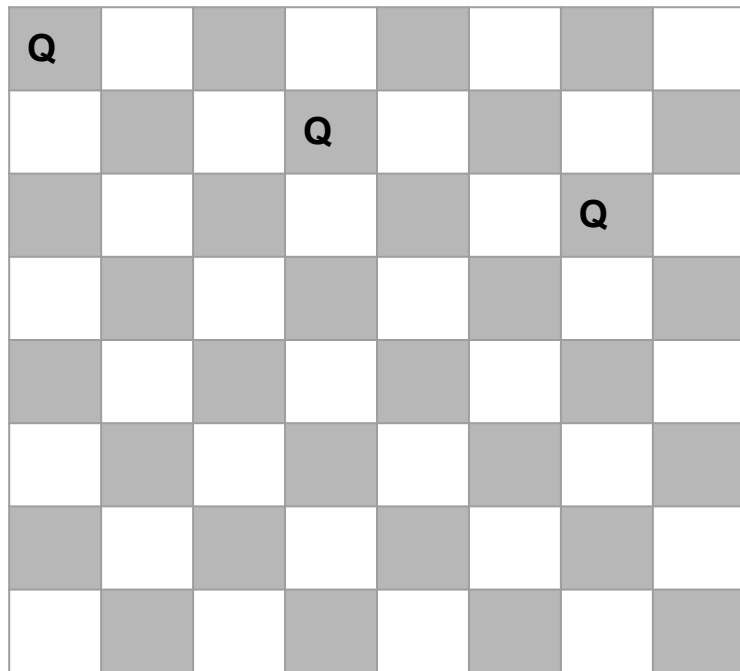


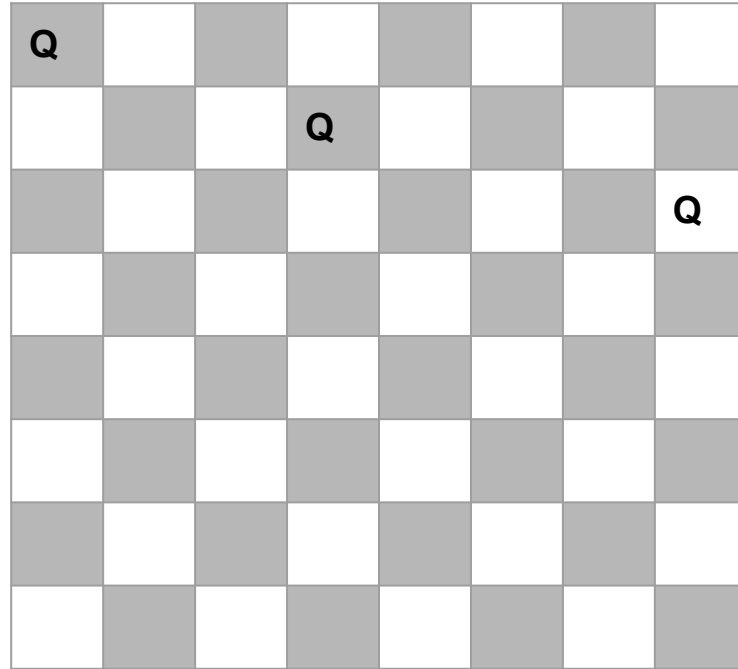


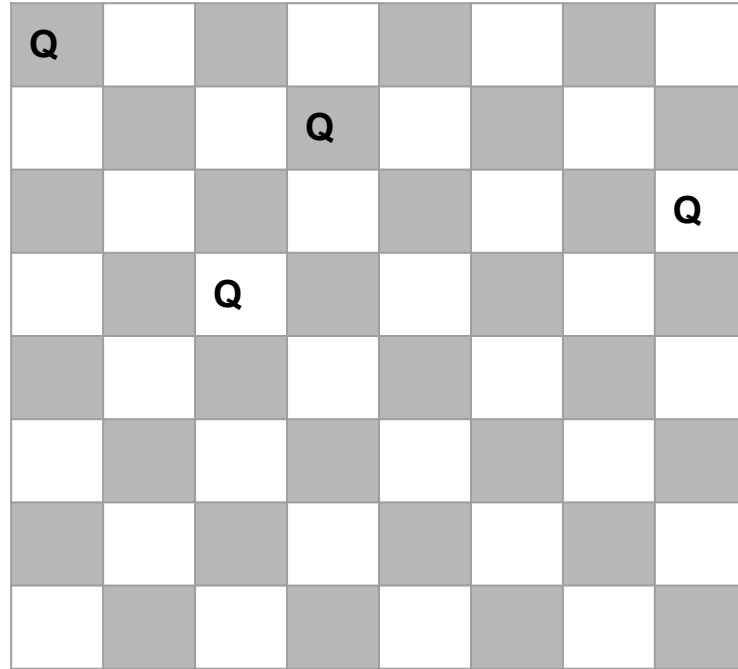


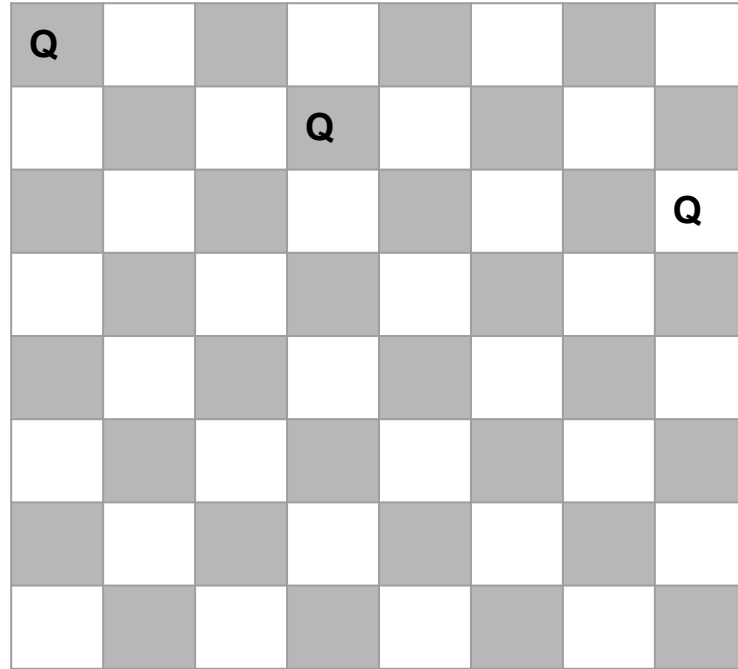


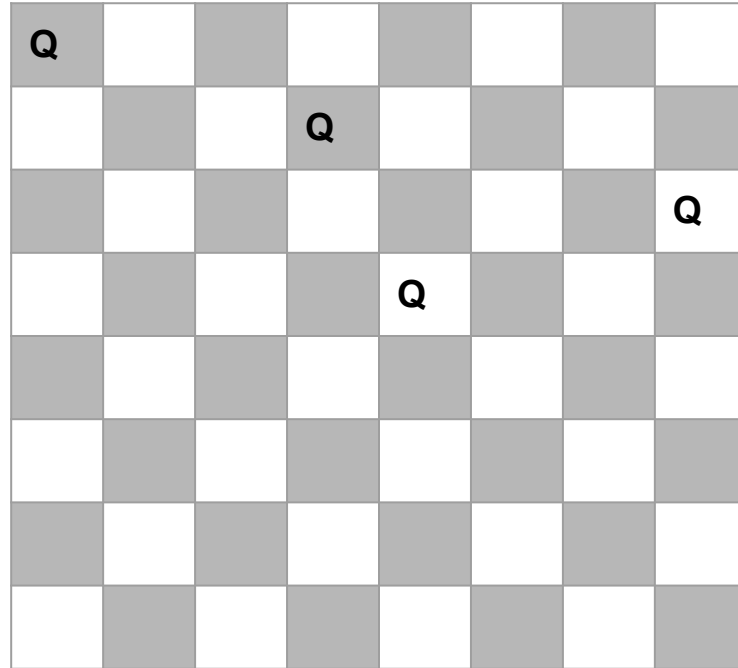


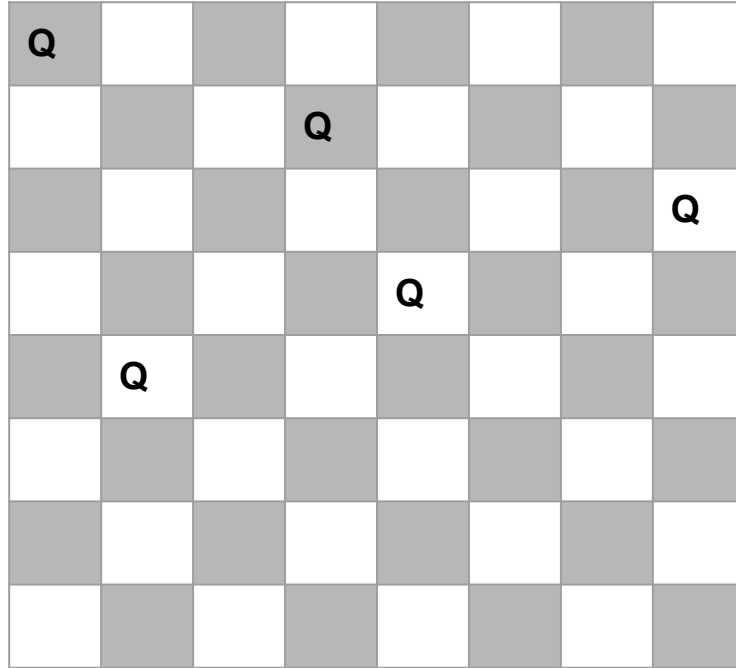


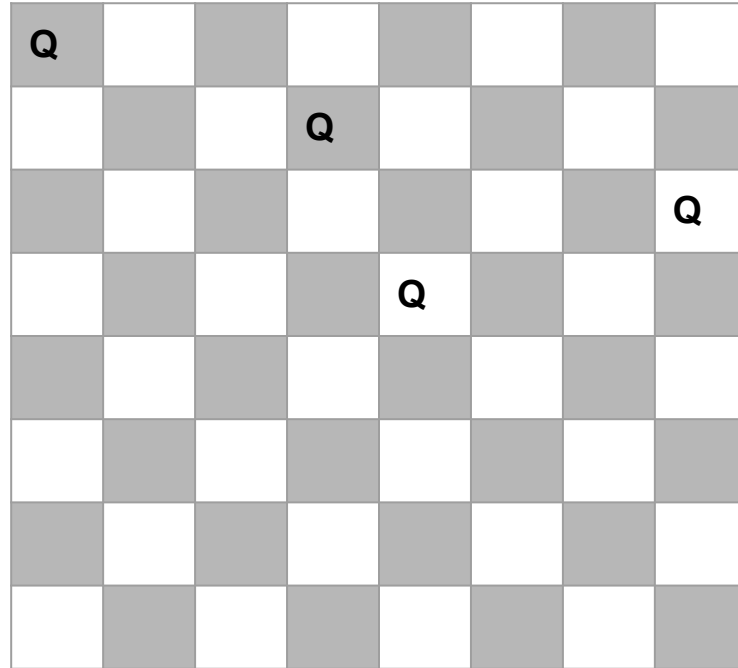


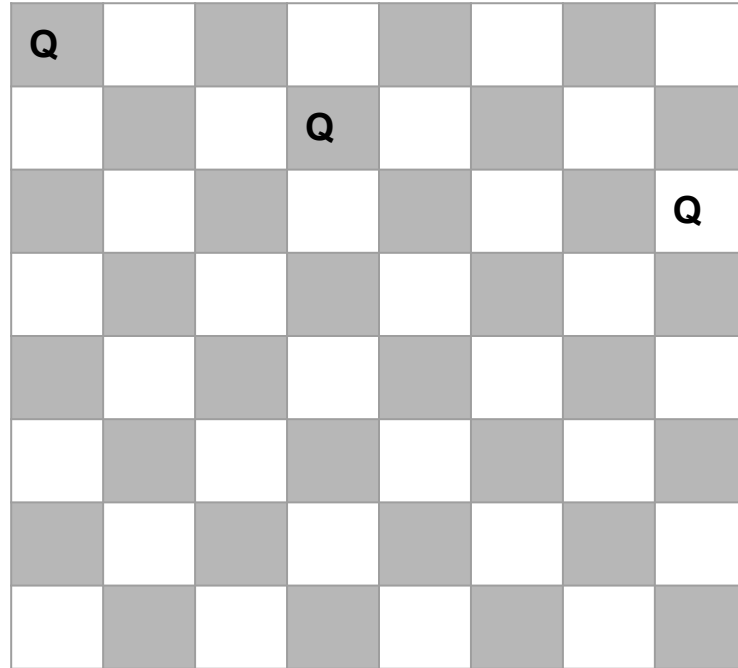


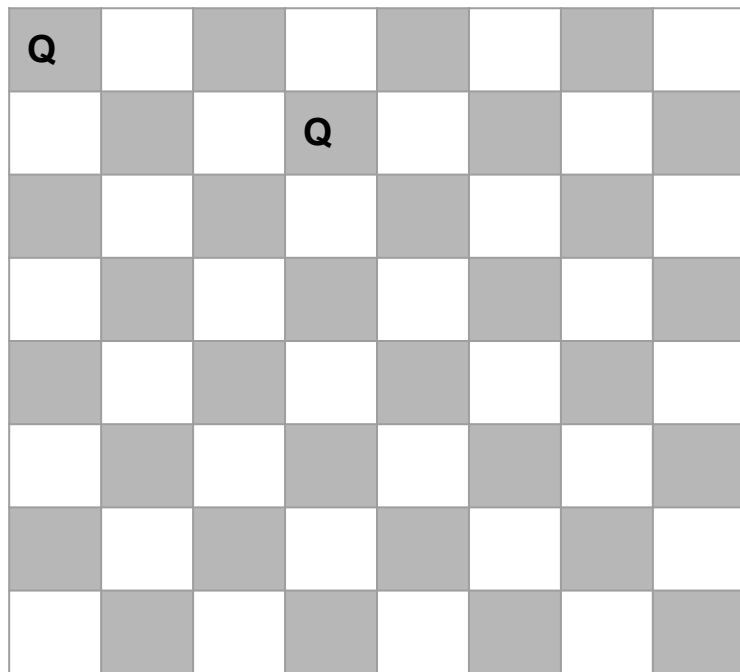


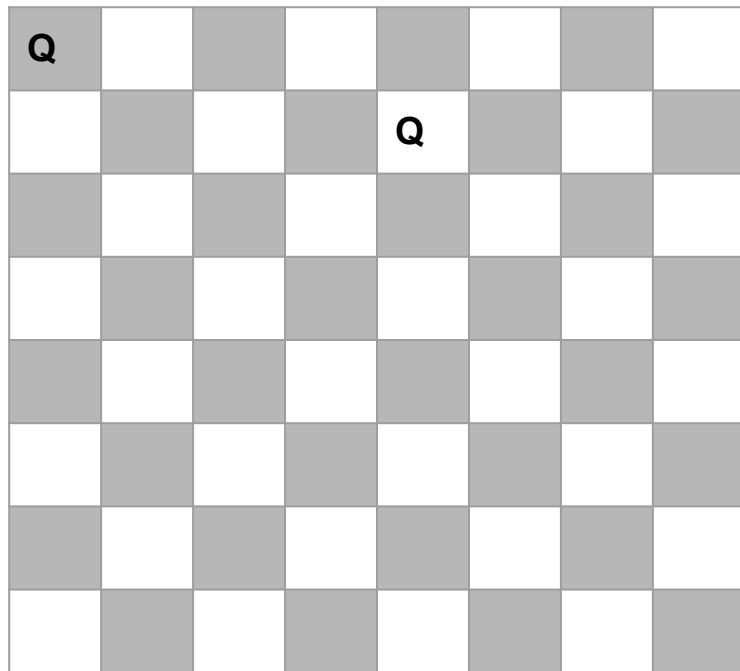


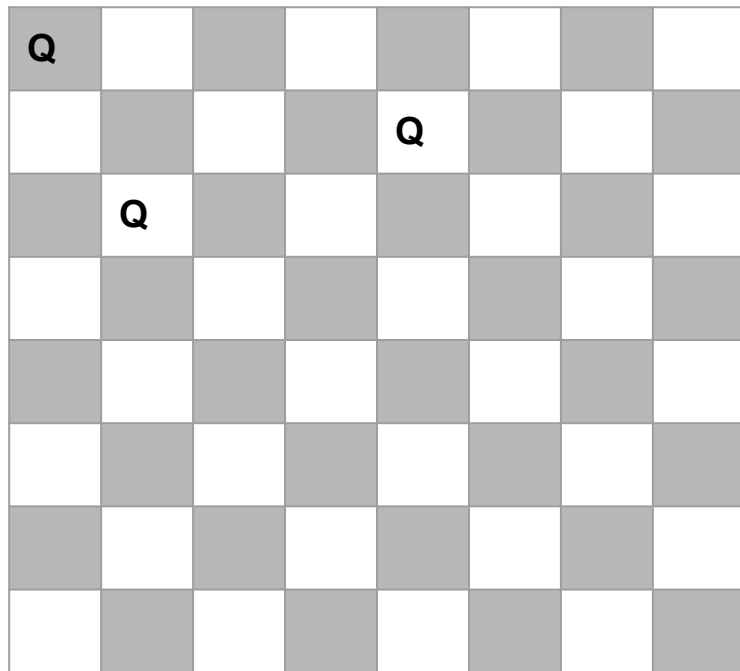


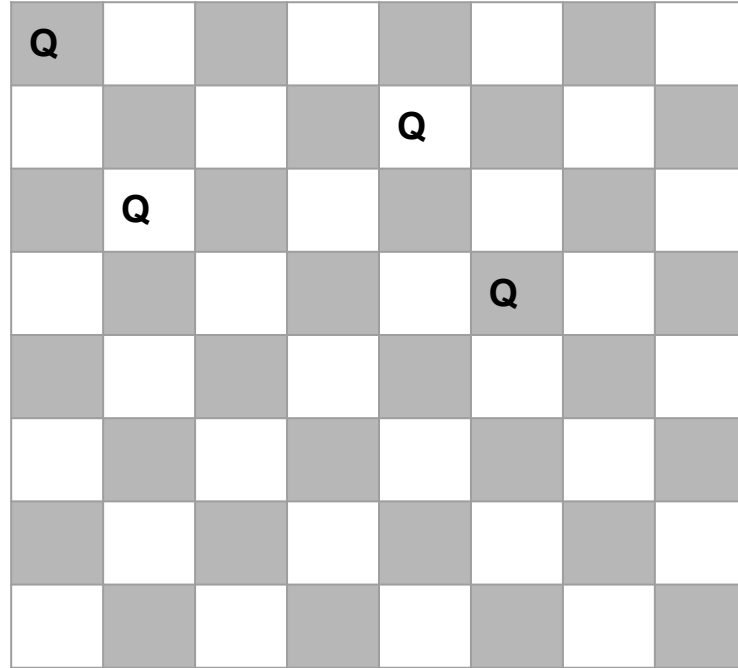


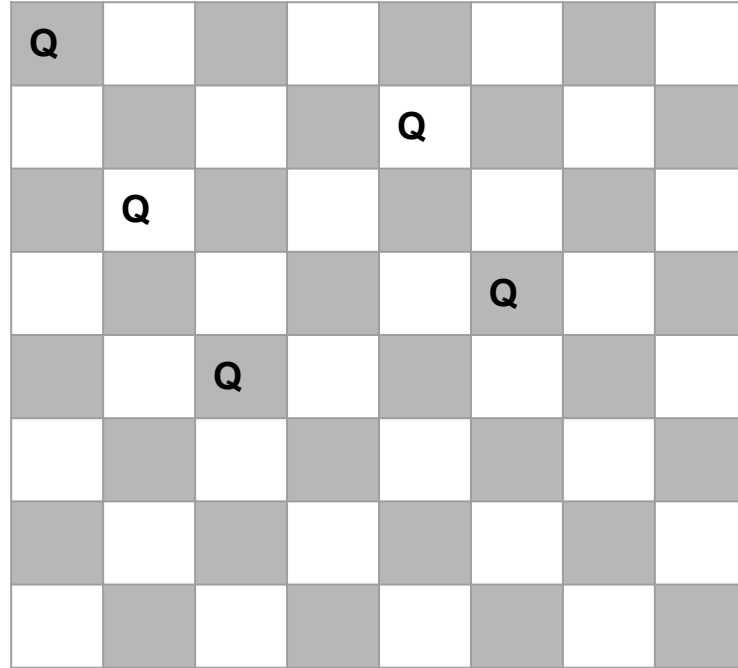


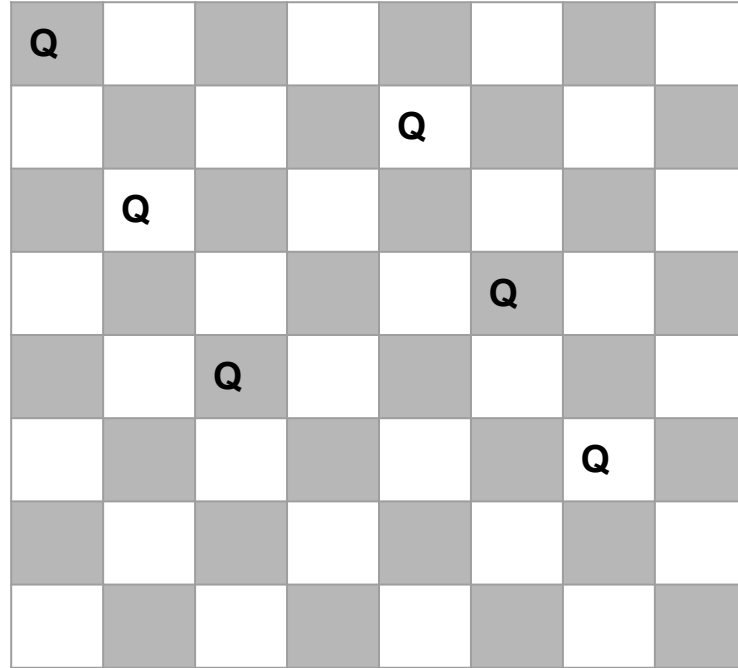


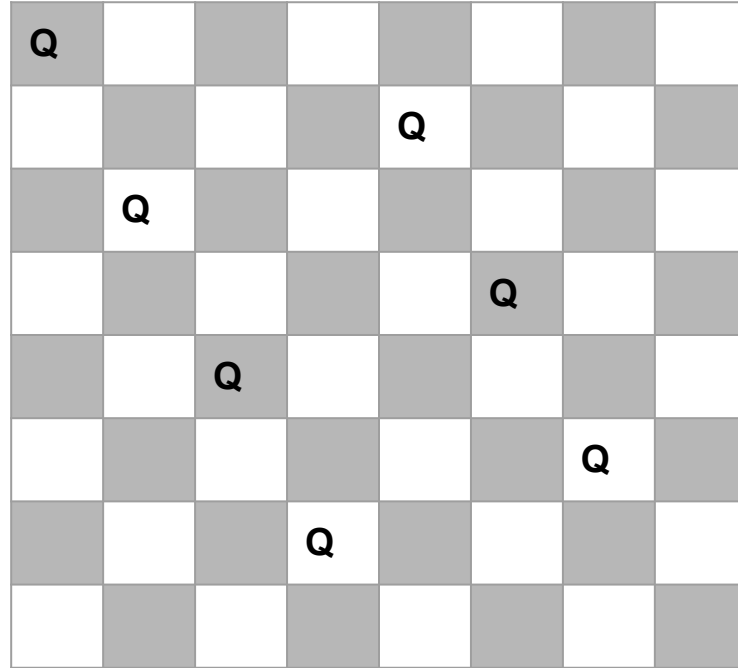


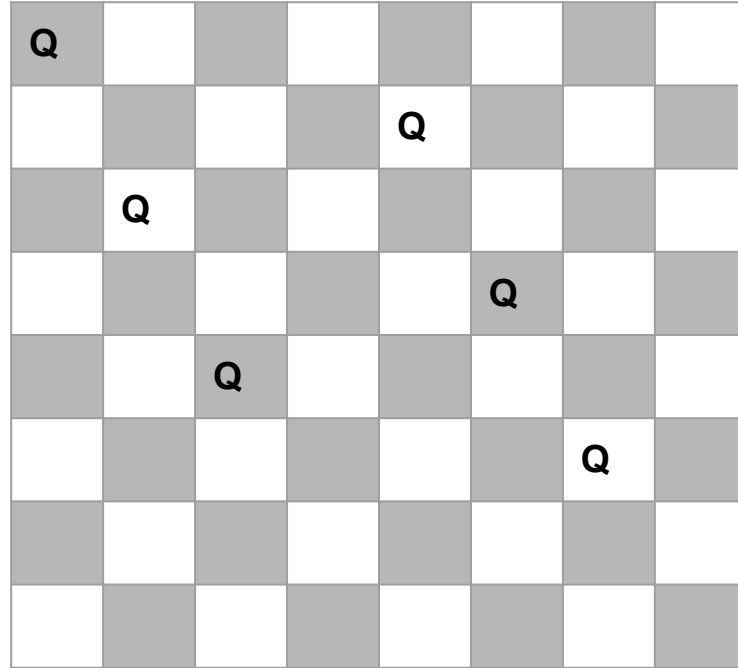


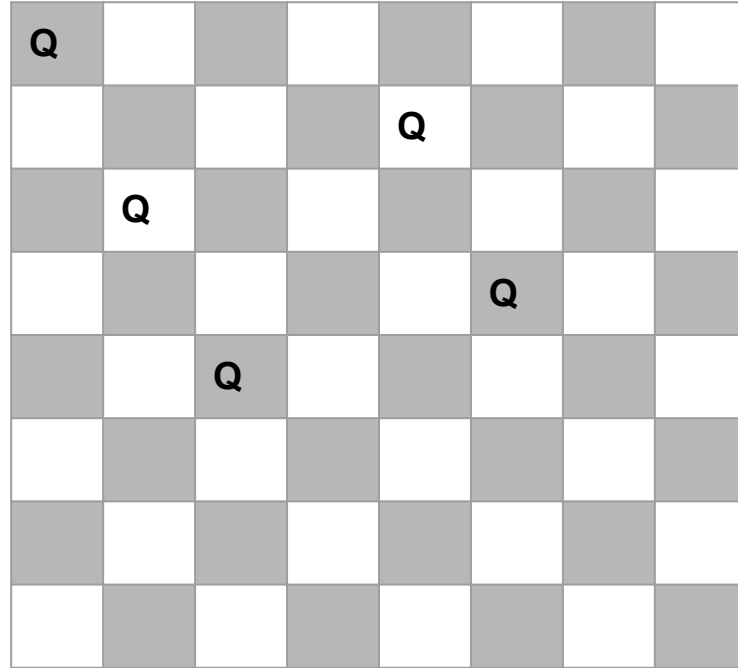


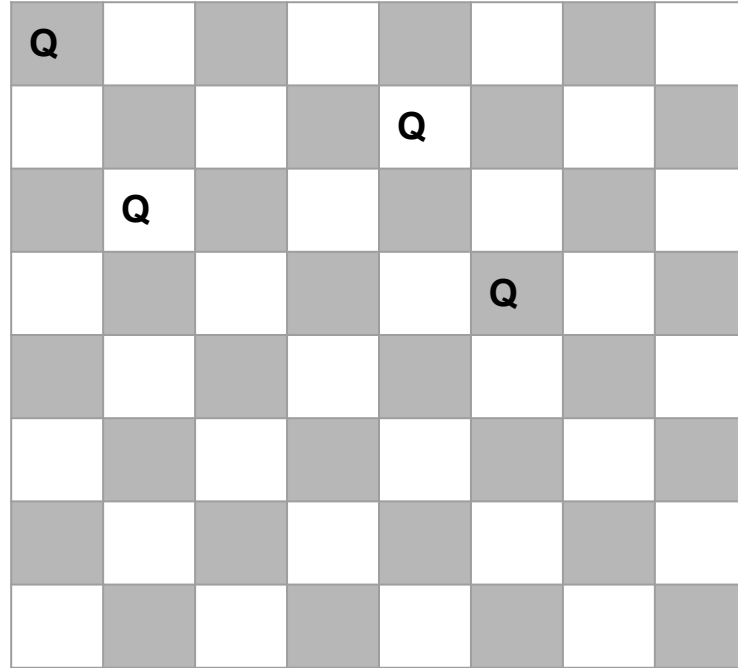


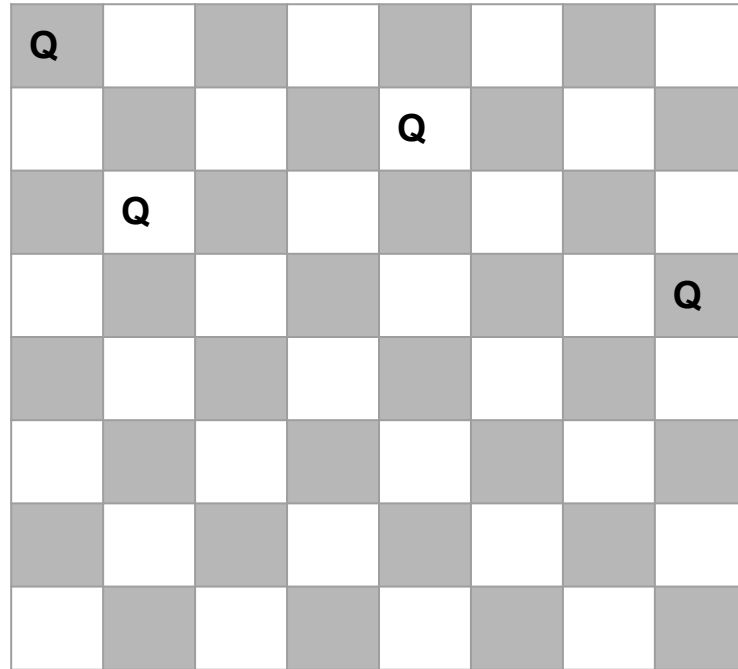


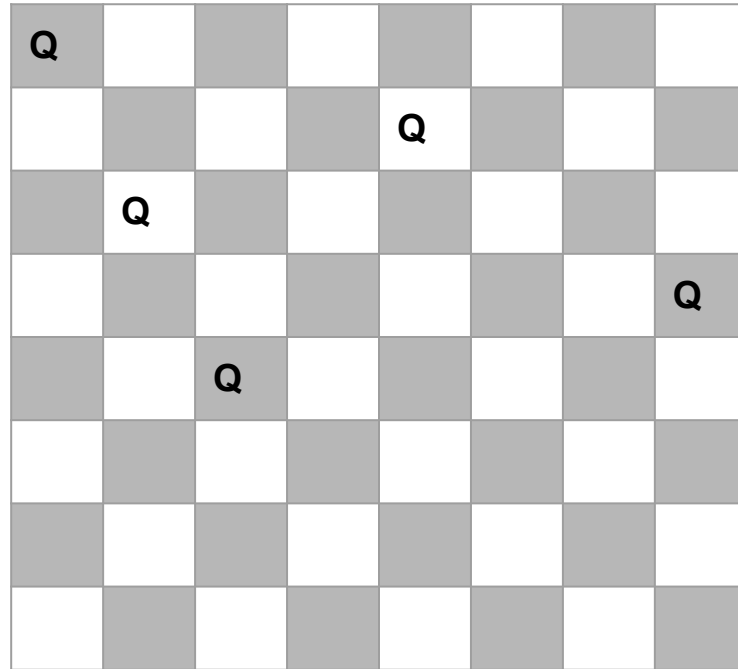


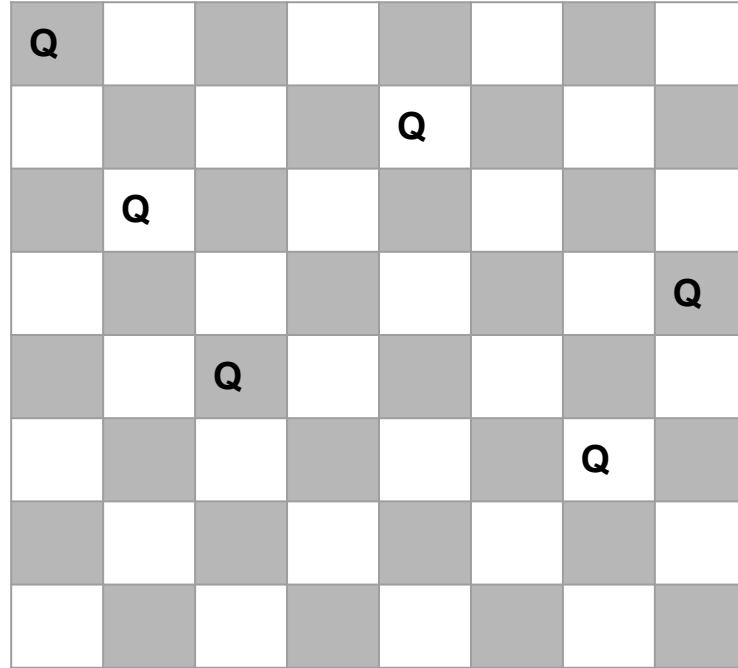


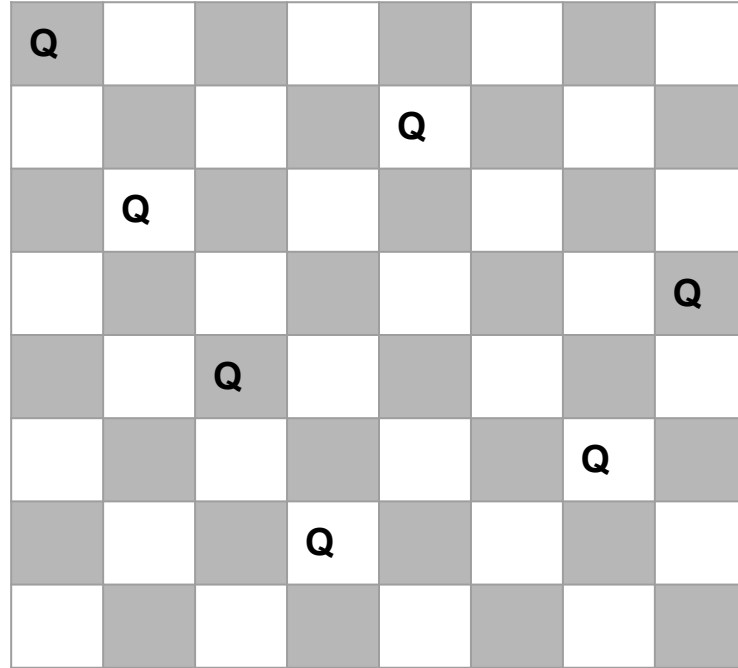


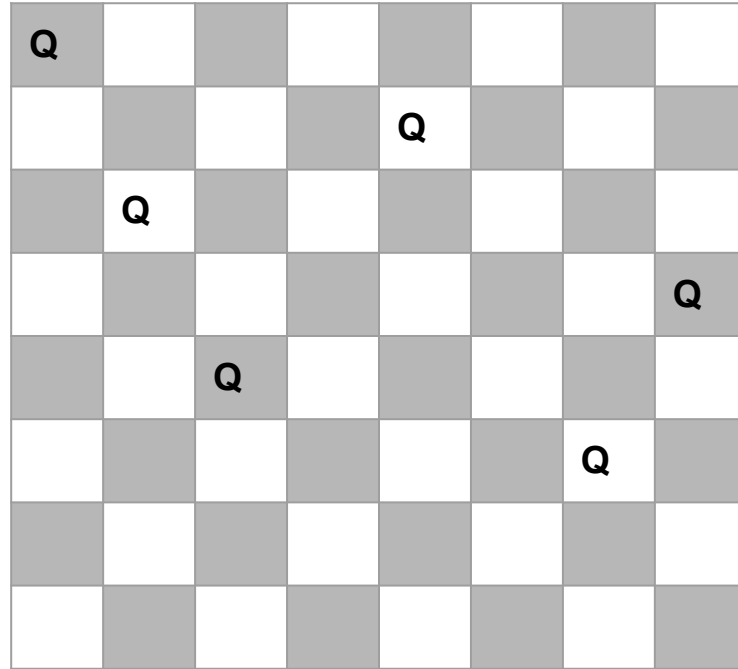


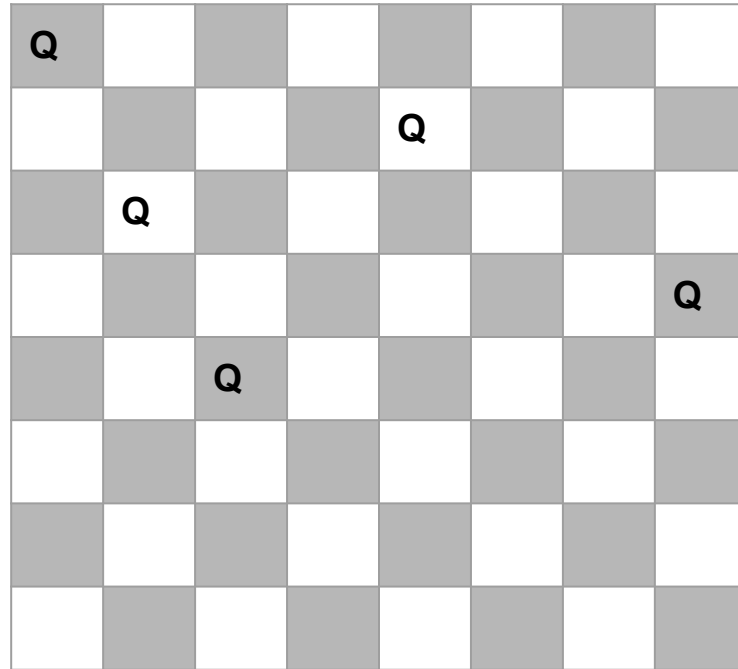


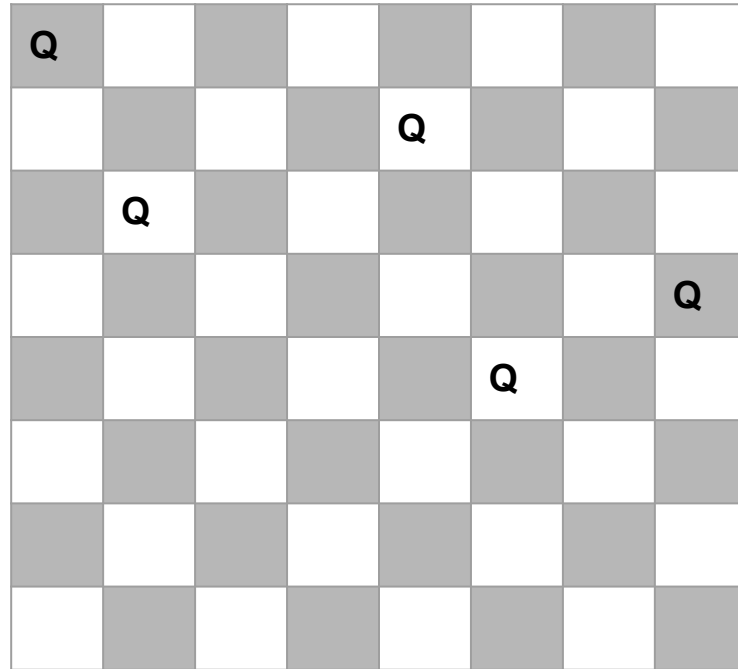


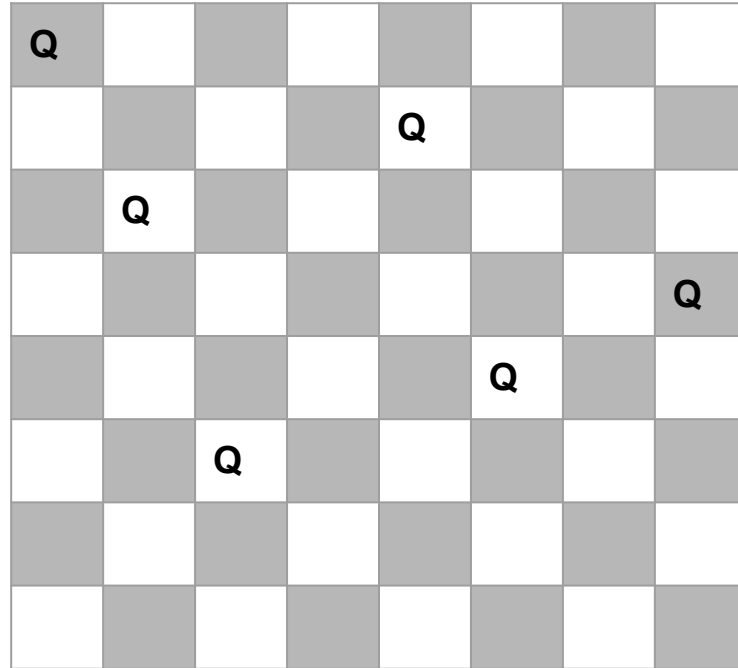


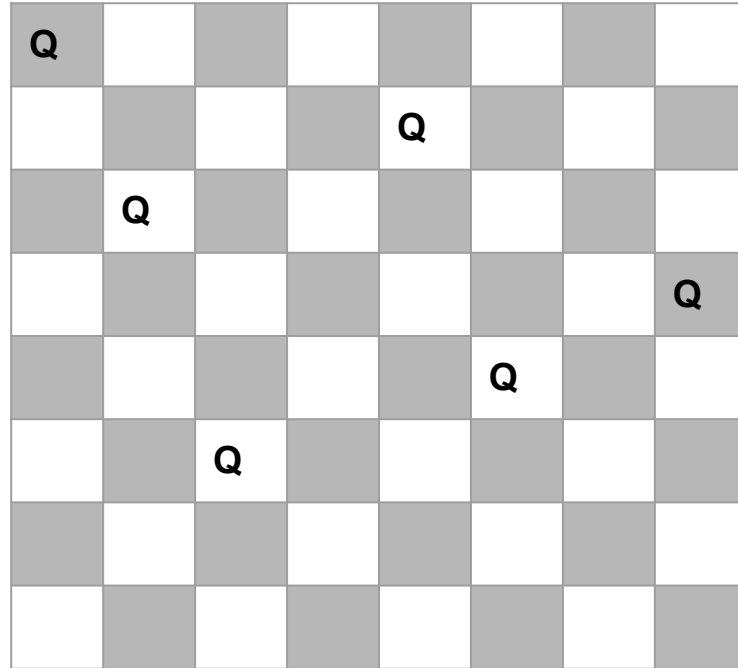


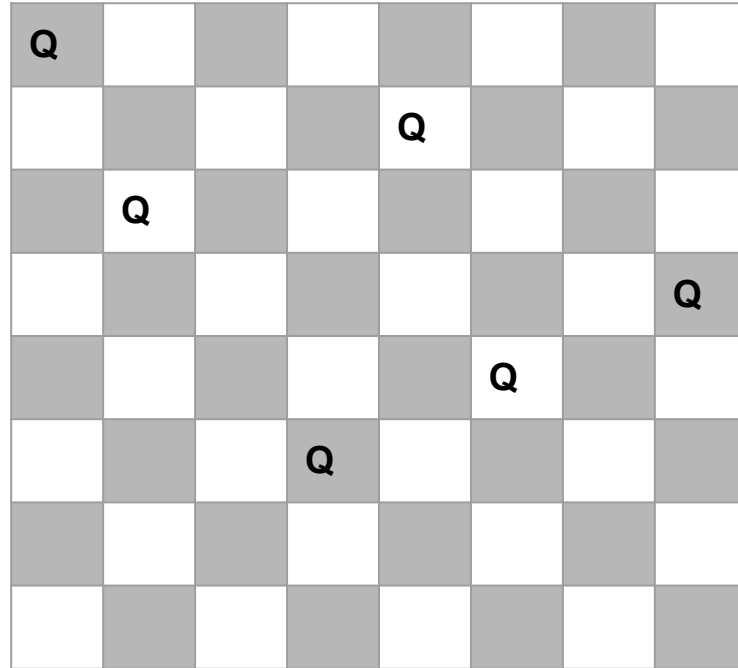


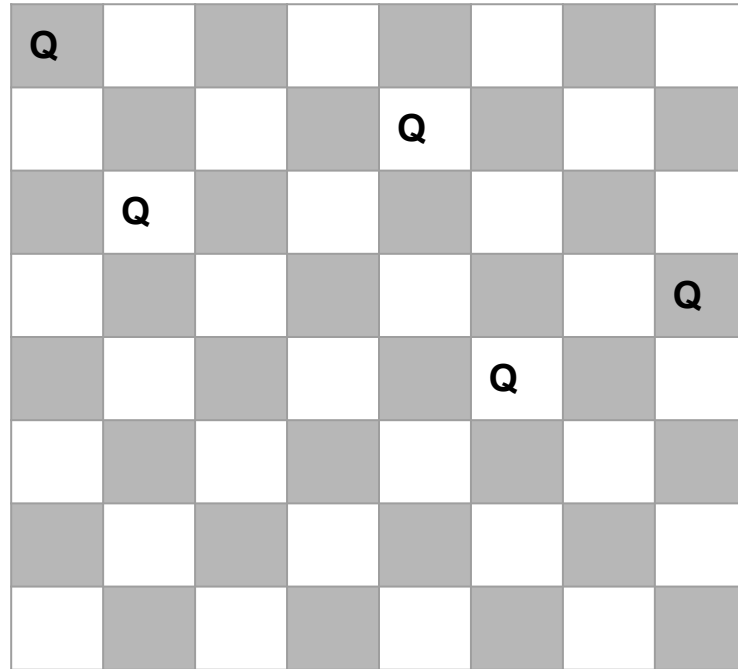


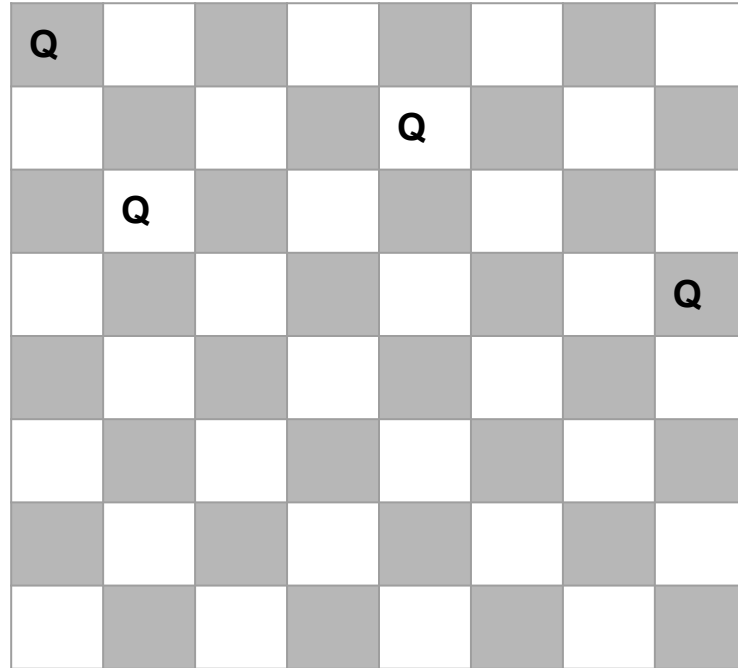


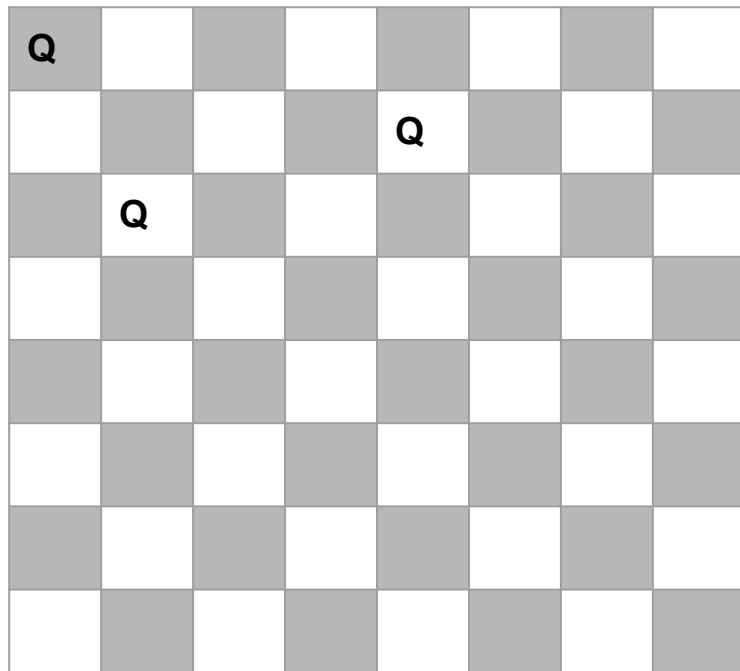


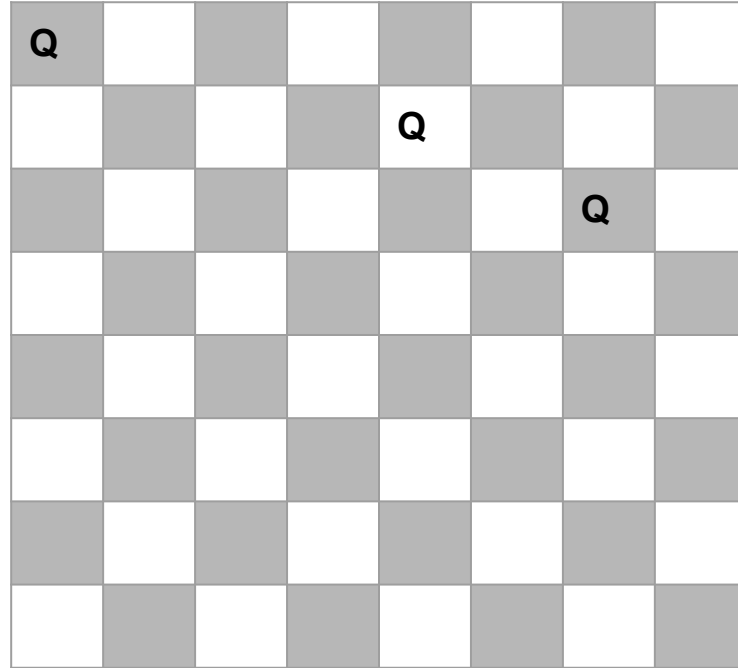


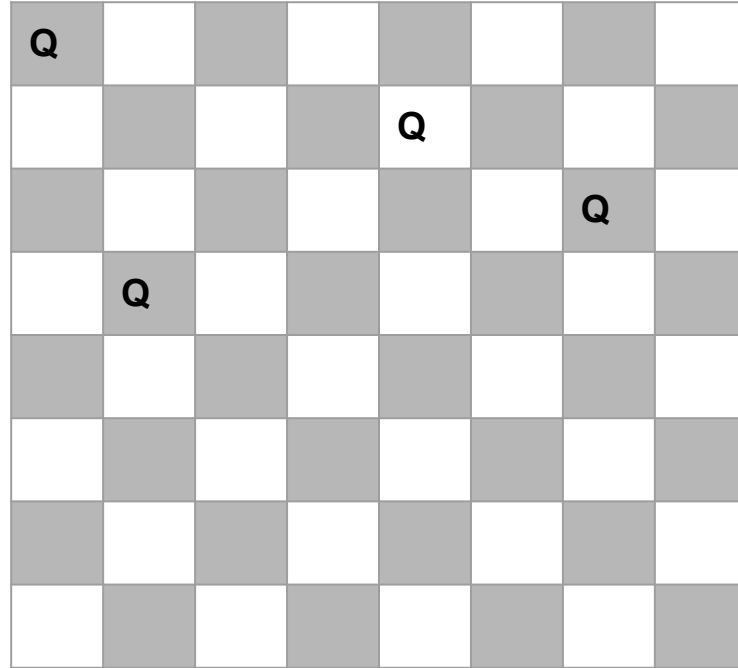


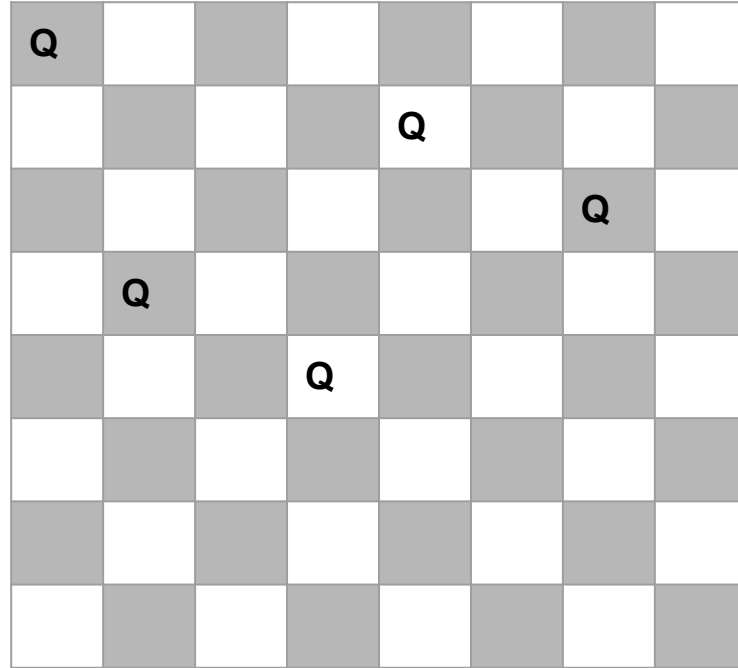


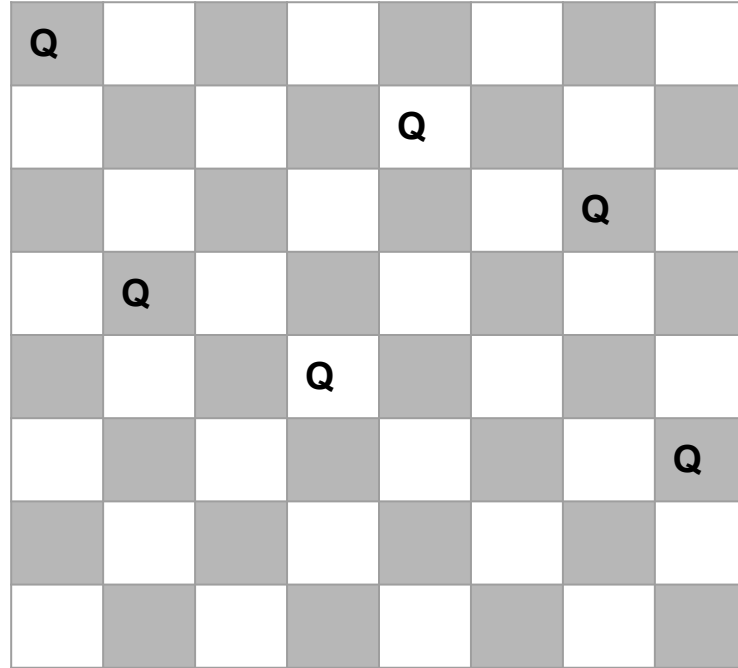


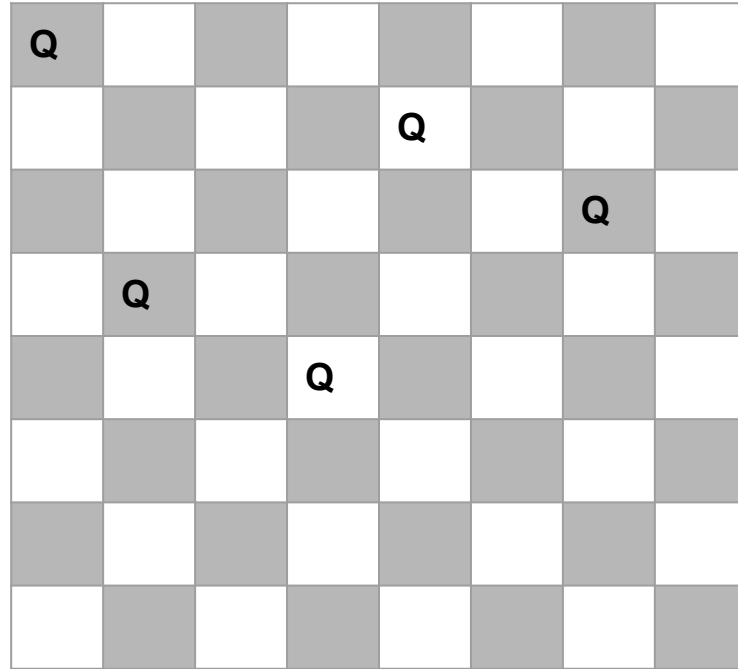


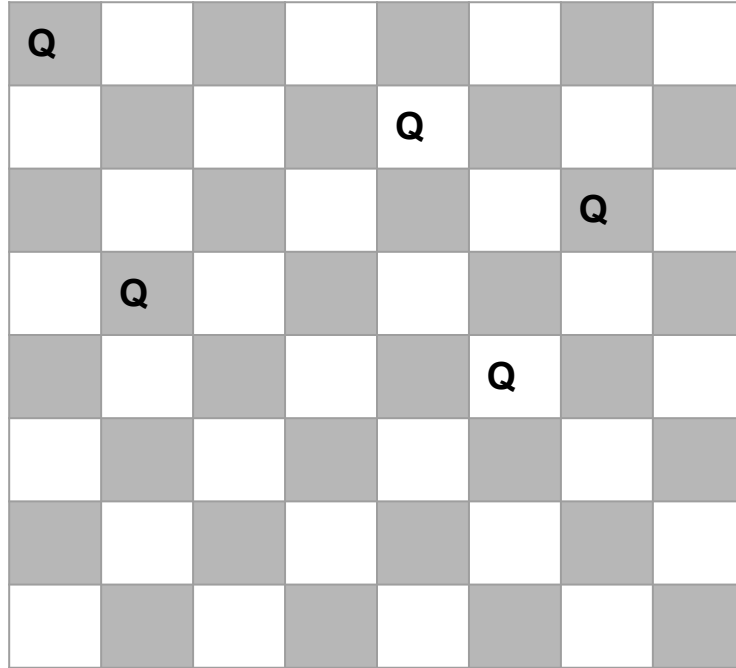


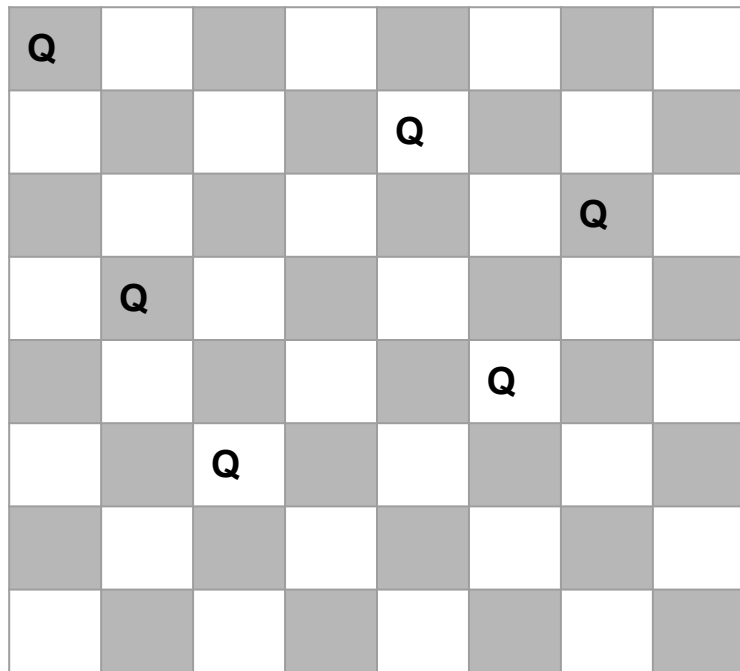


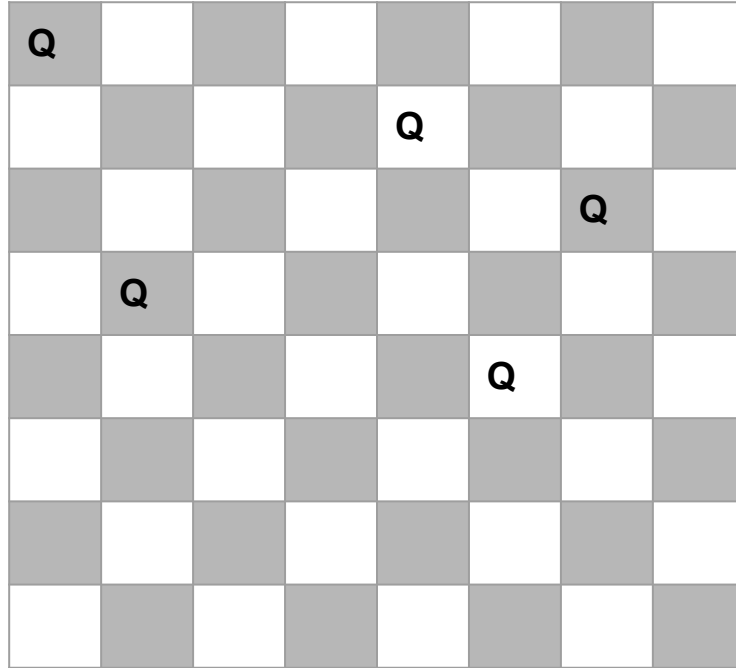


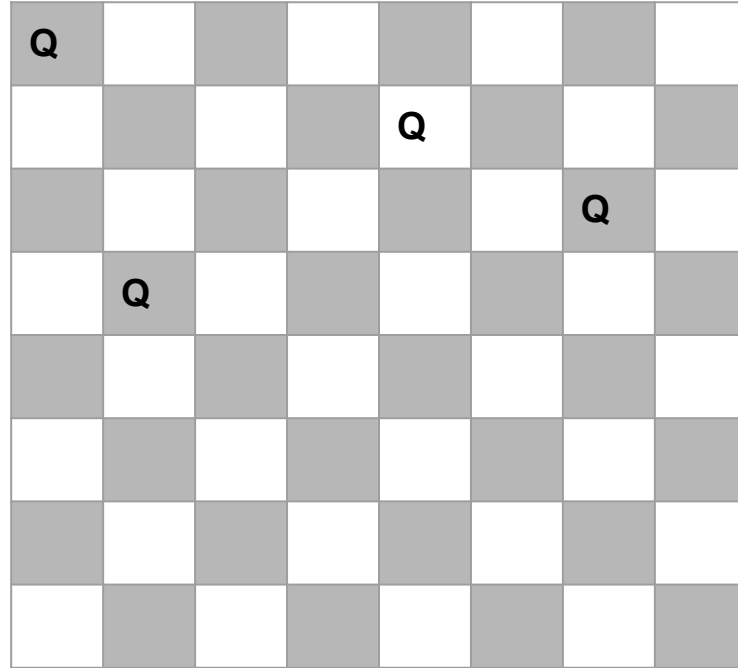


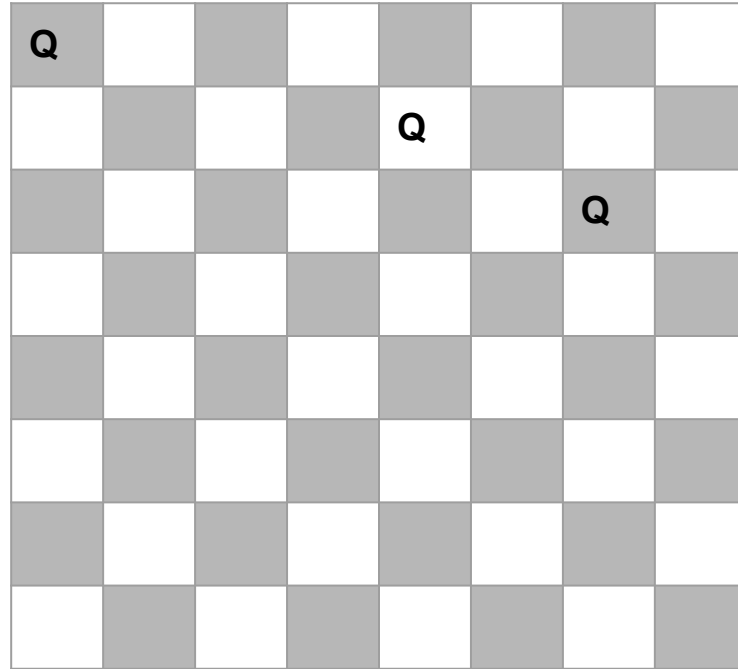


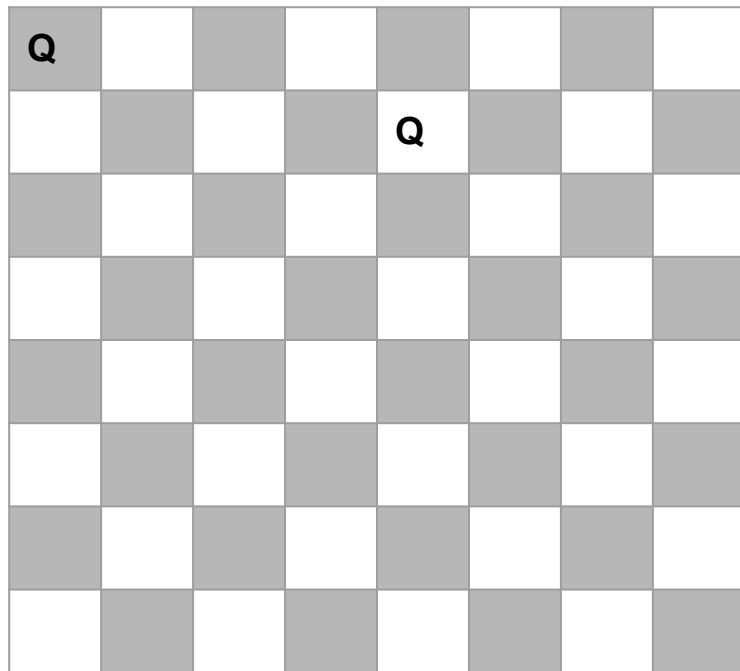


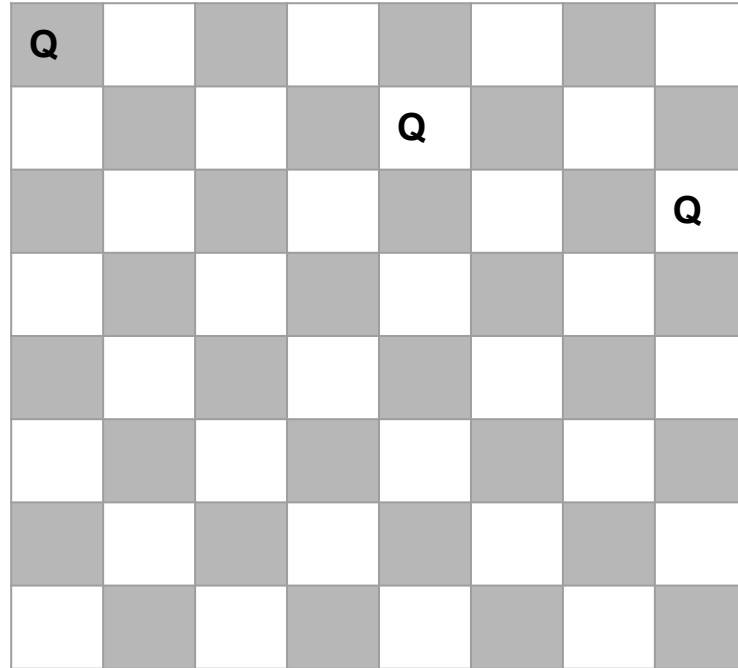


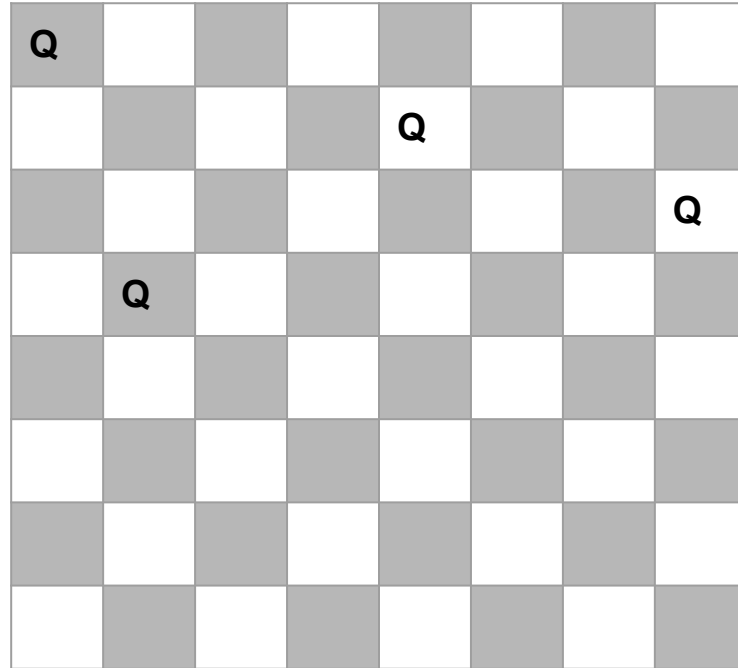


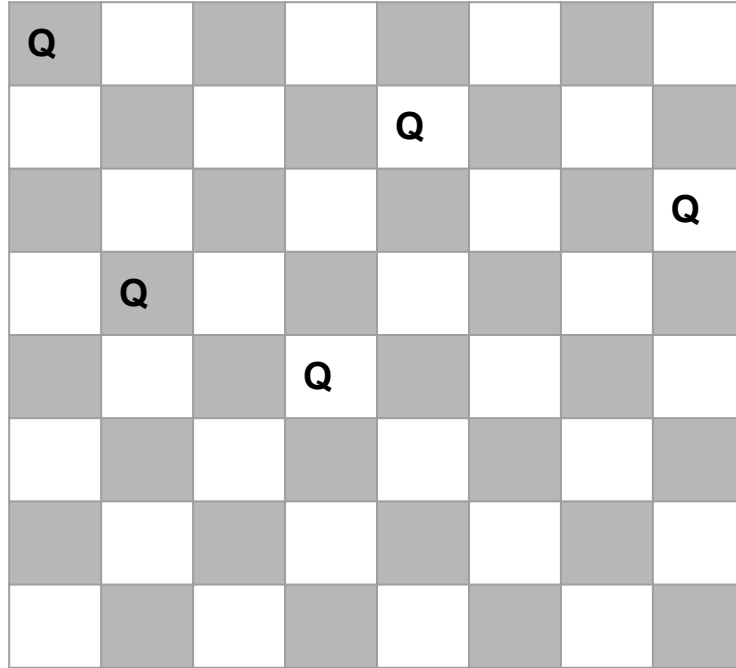


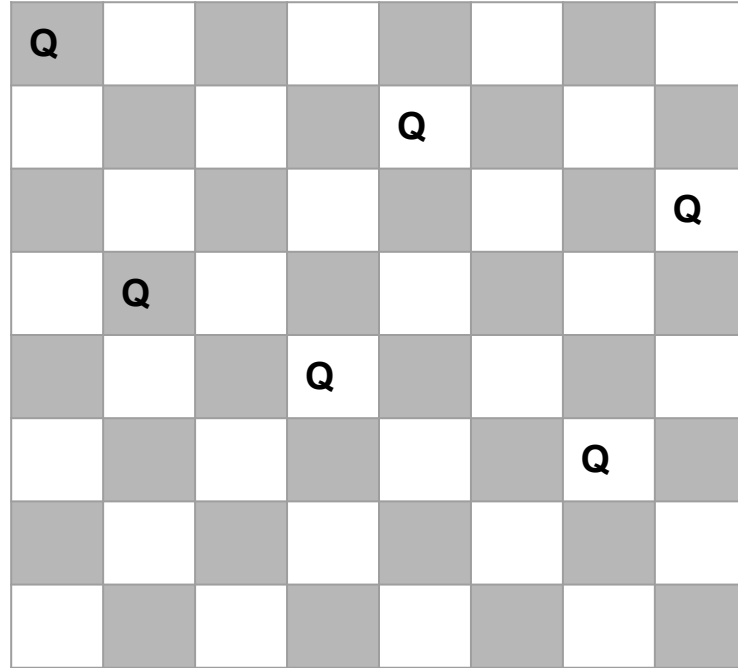


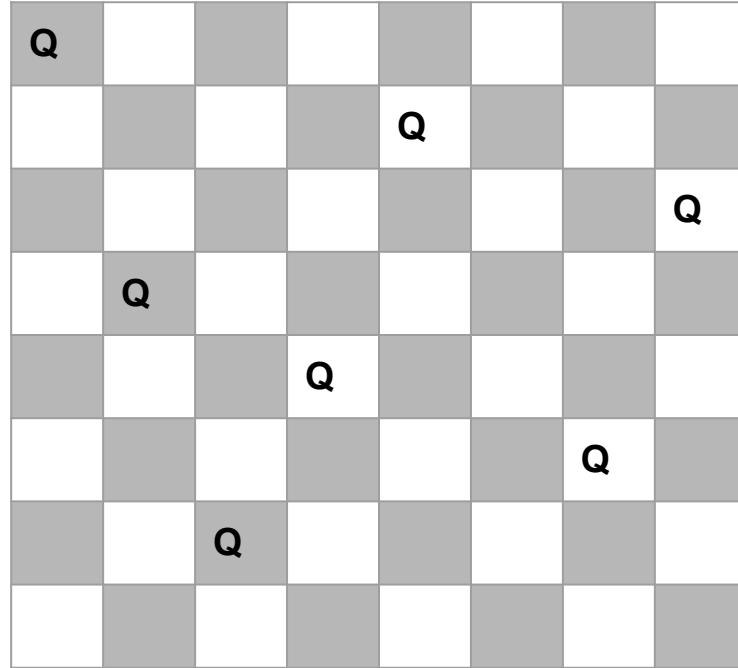


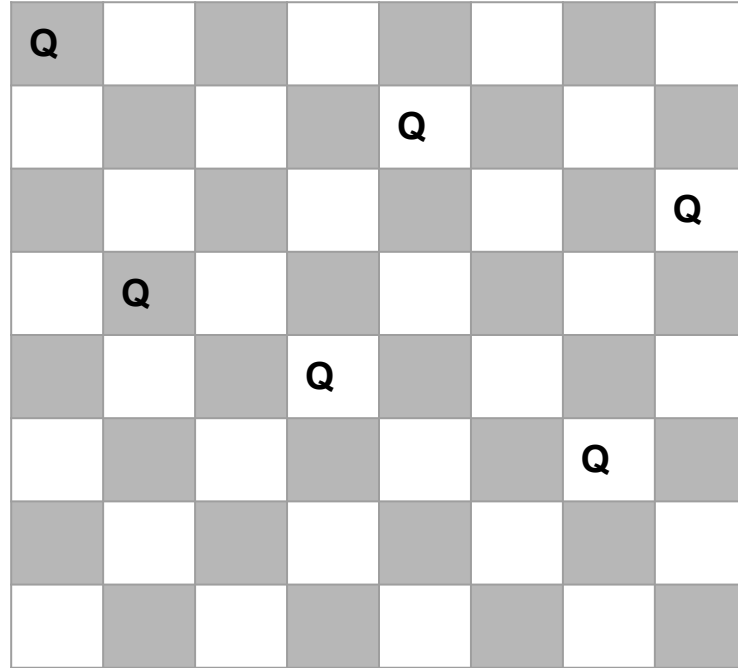


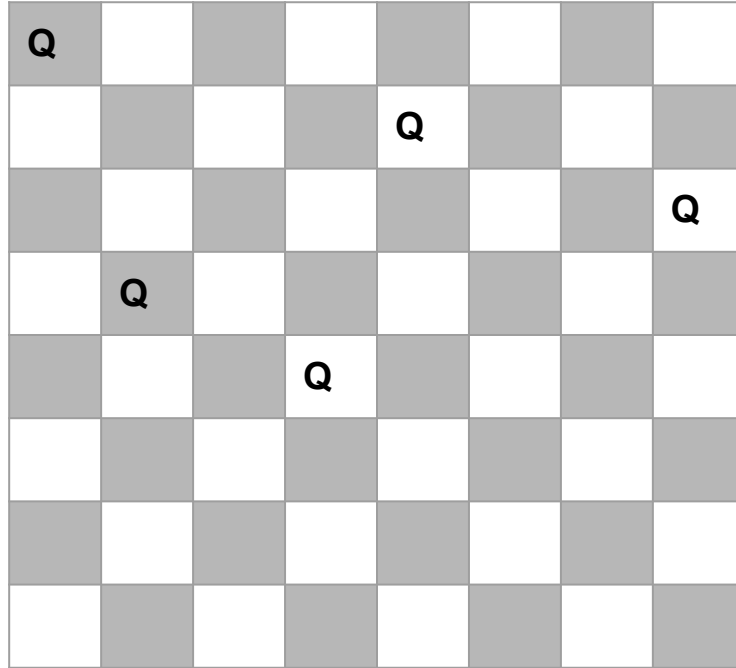


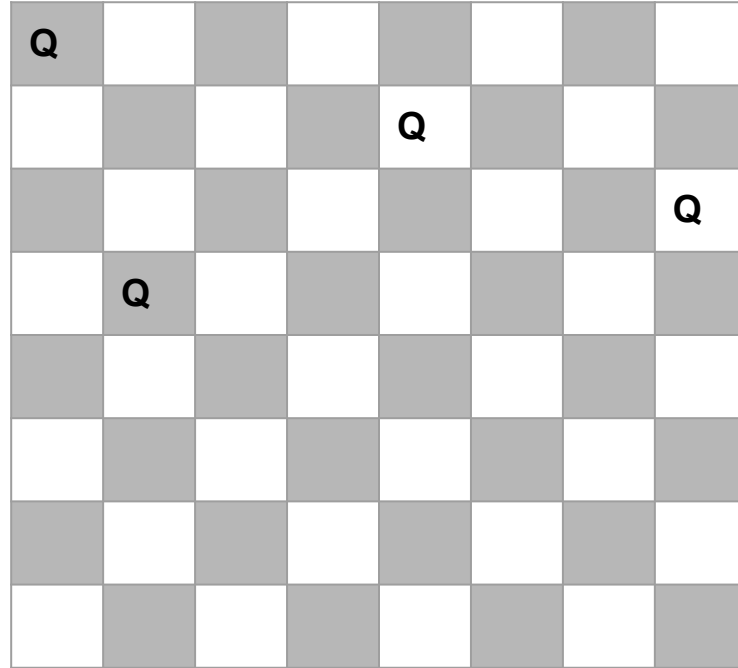


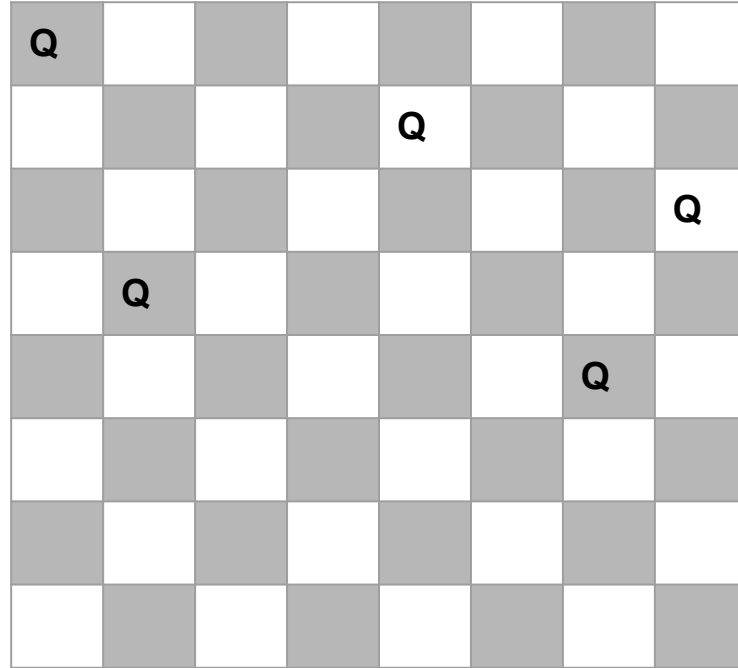


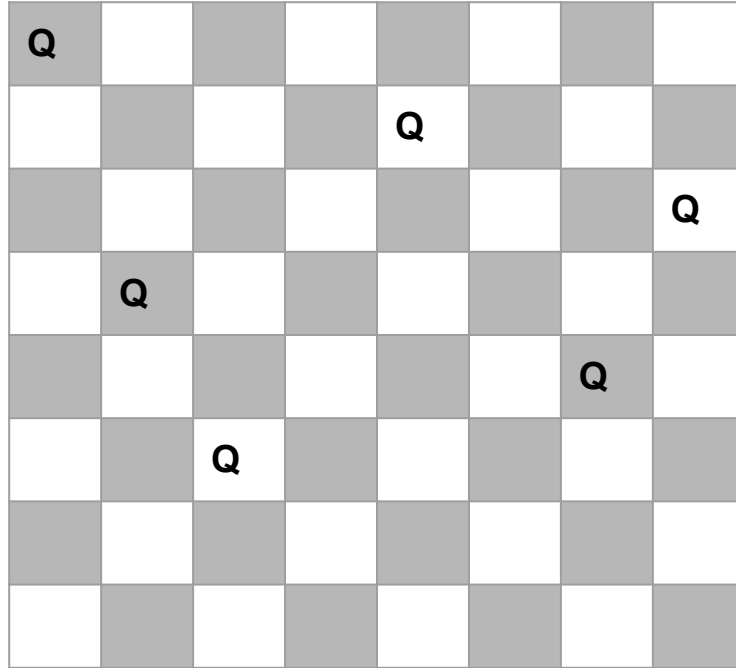


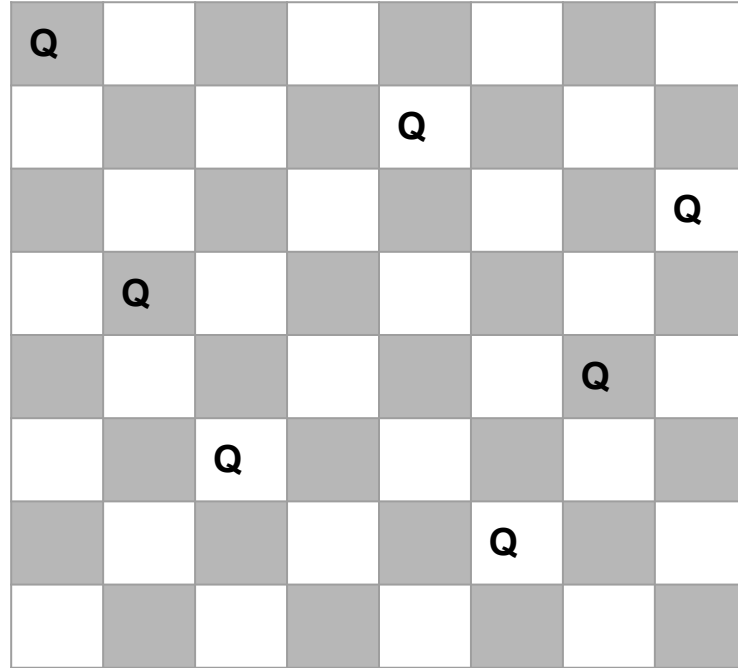


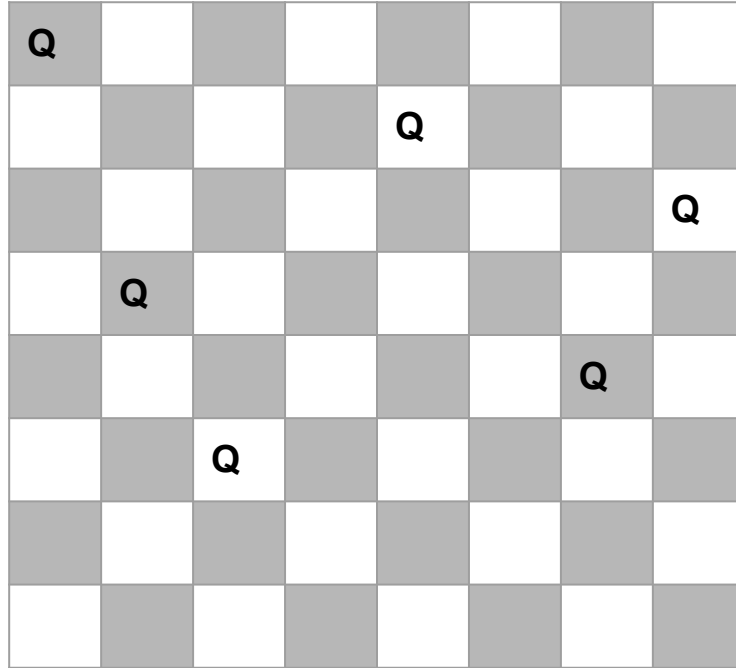


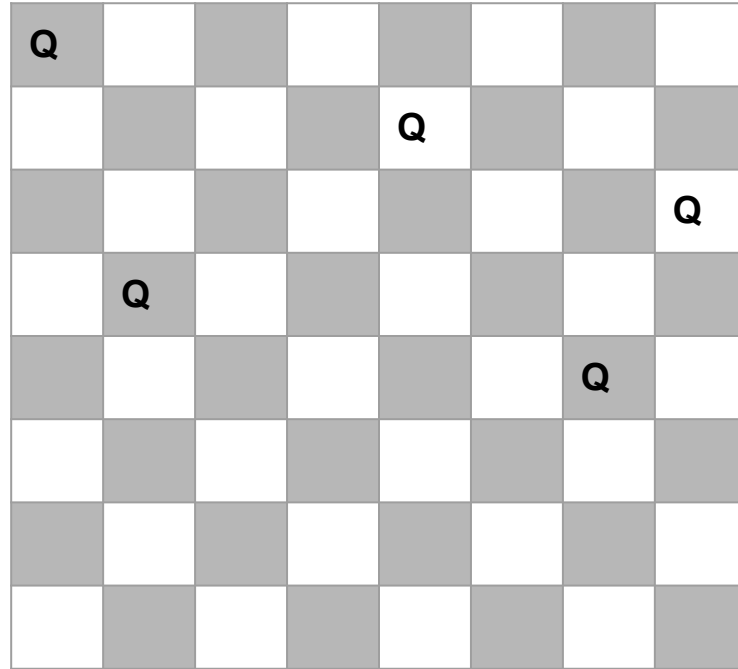


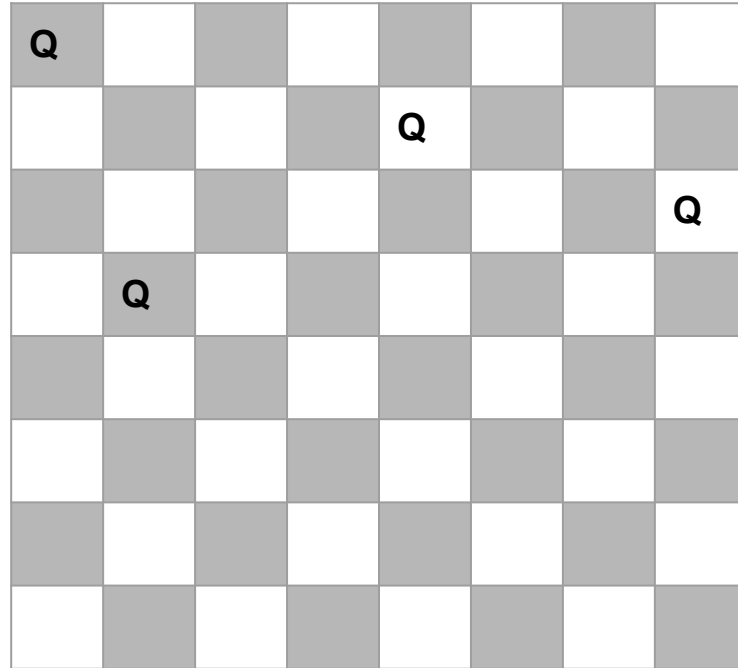


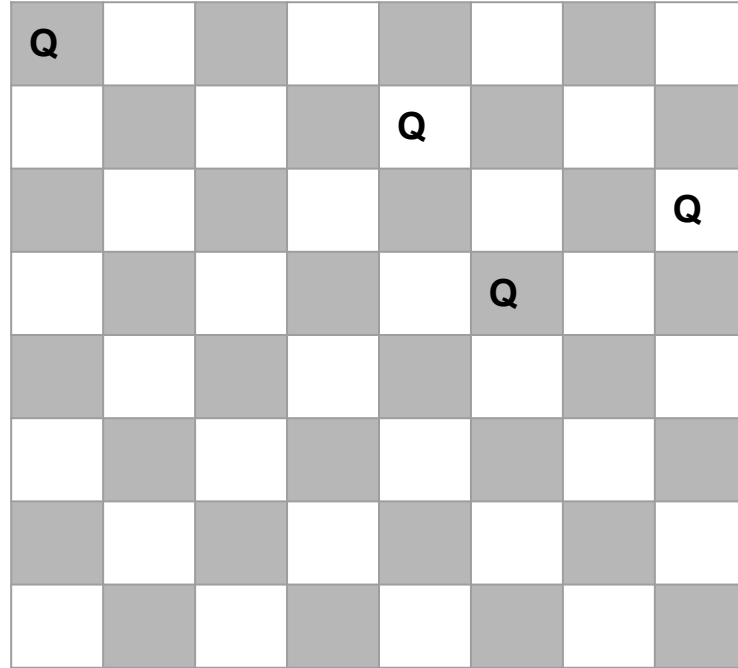


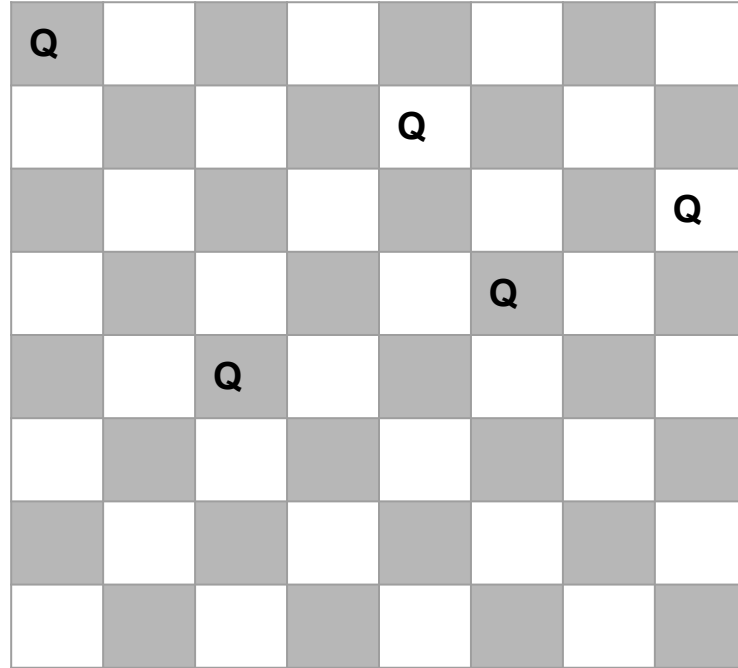


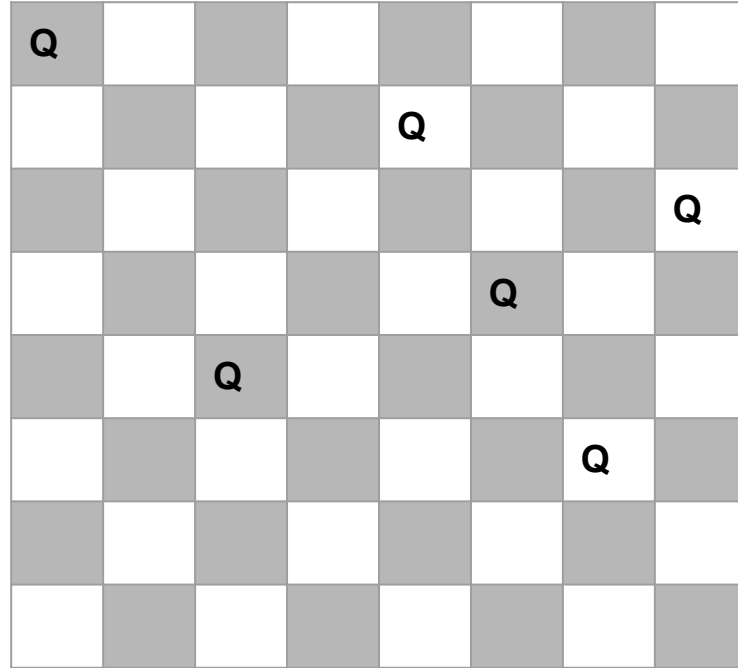


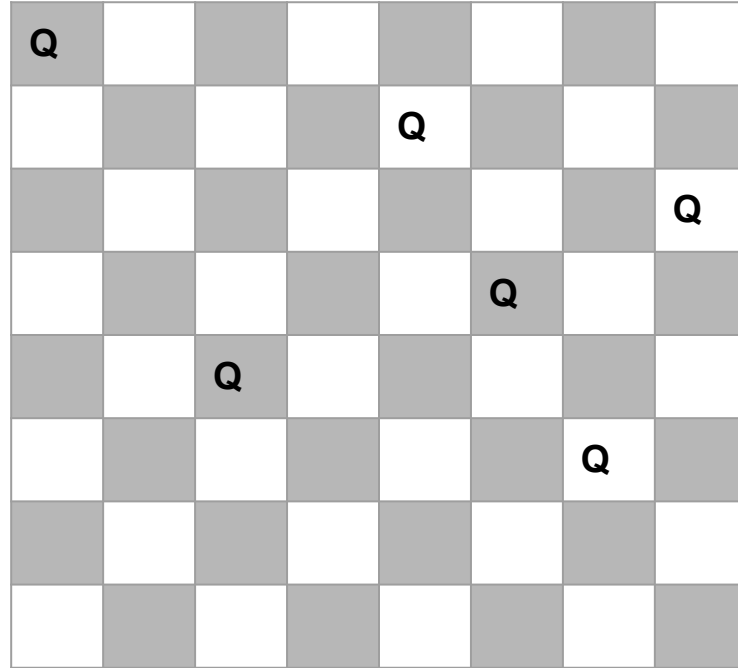


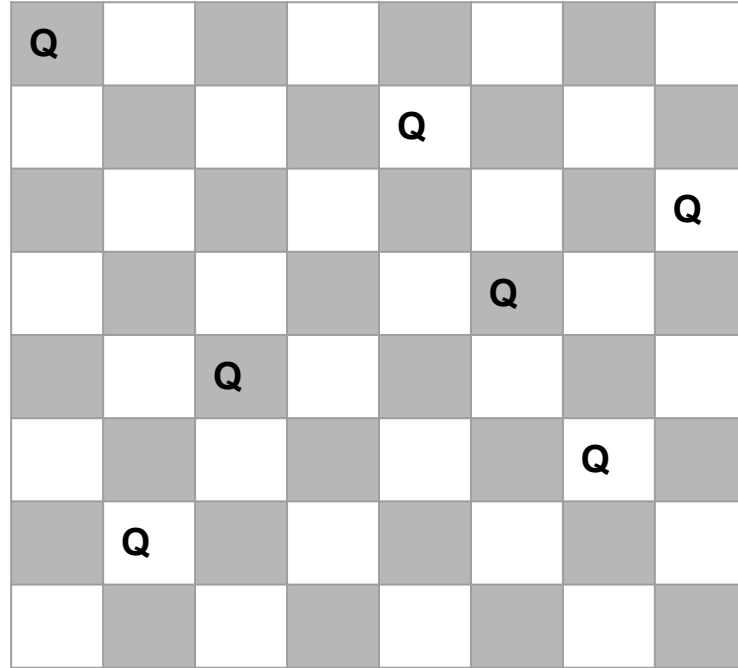


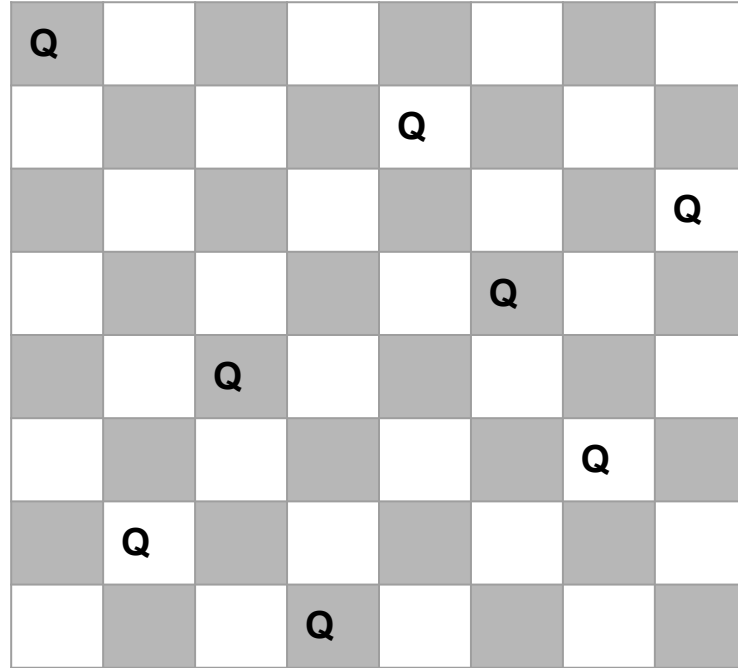




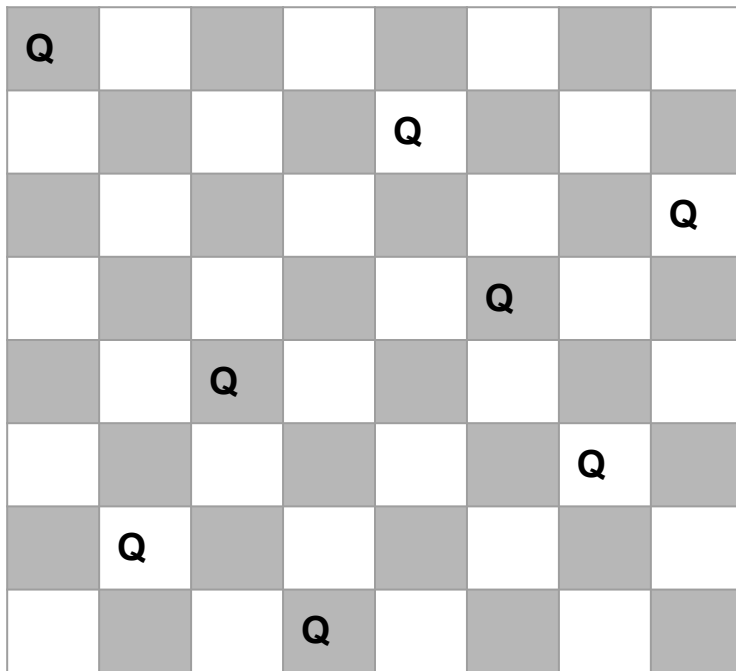




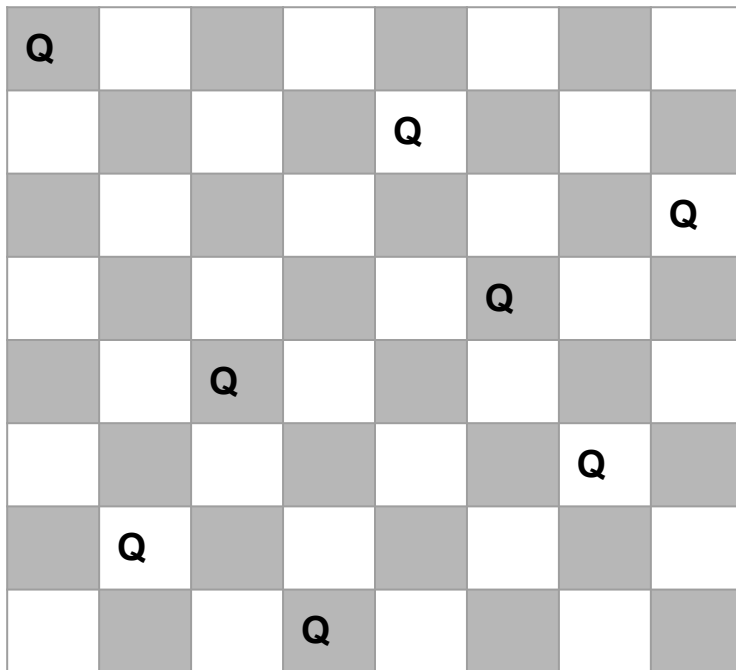




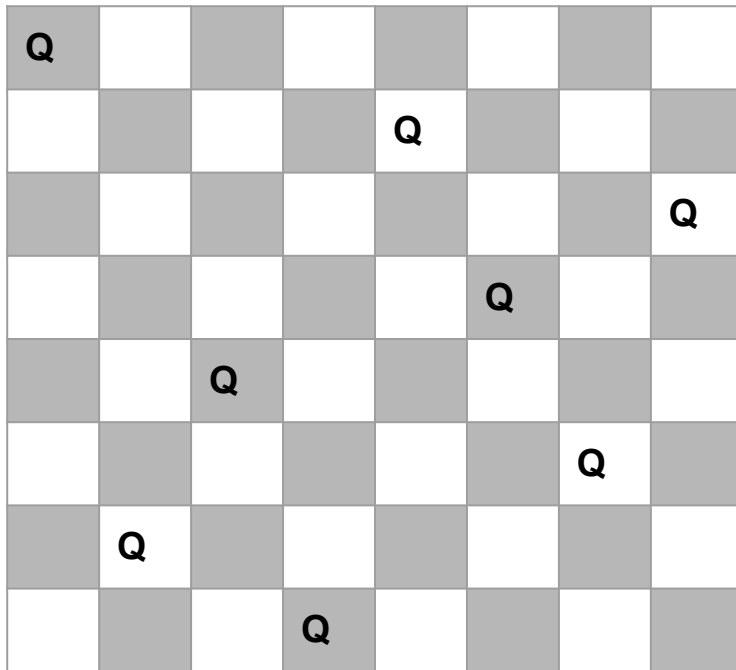
Found a Solution!



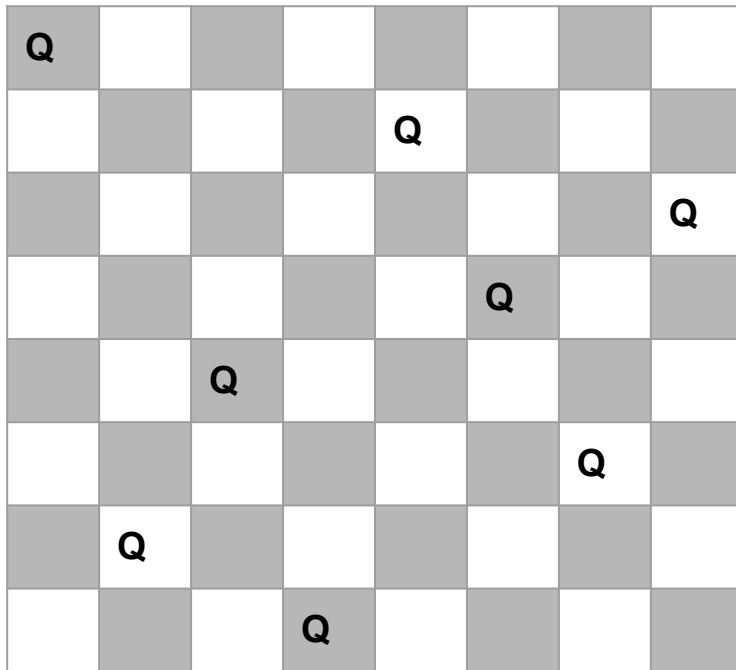
Found a Solution!



Found a Solution!



Found a Solution!



Coding steps

- Create a board first
- Get and Set Queens on the board
- Is a location valid
- Search for one solution first
- Find all solutions
- Refine