Artificial Intelligence 1

Lab 2

Name1 (s number 1) & Name2 (s number 2) & Name3 (s number 3)
Team name
Learning Community

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Exercise 1

1. We ran the program multiple times. The results are for 8 and 50 queens are in the appendix at the end of the document. We notice that, the larger the grid, the fewer queens are under attack. However, the program almost never solves the problem, but often gets close.

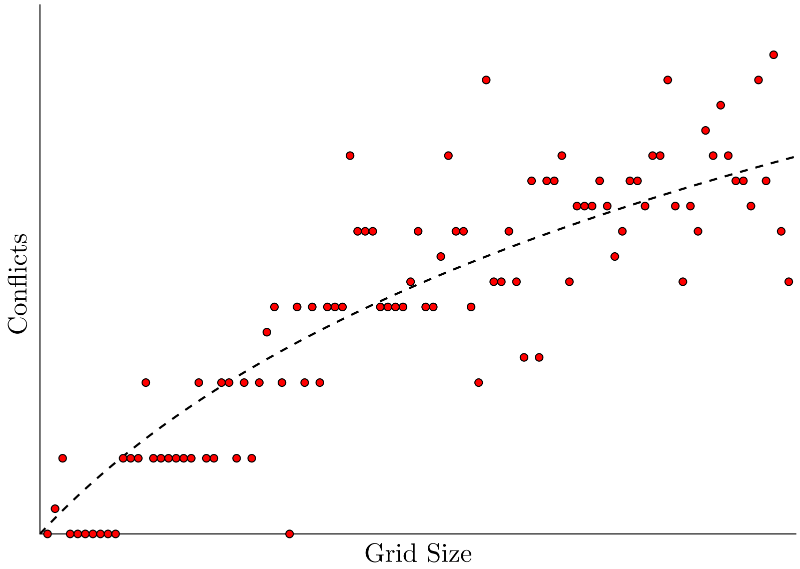
2. The algorithm loops over all queens, and puts them each in the most favourable position. This way, it might look like the solution is going to be optimal in the end, but the pseudo-optimal placement of the first few queens might hinder the yet-to-be-placed queens. Therefore, if this situation occurs, the found 'solution' might not actually be the optimal one, thus the program fails.

3. We might improve the algorithm by implementing a so called Random-Restart-Hill-Climbing algorithm. The idea behind this is as follows. If we dont find the solution, we try again, from another random point. The problem with this approach regarding this problem, is that, there are a lot of random restarts possible. Therefore, we must set a cap to the amount of restarts we allow, say, 25.
   We ran a test, and immediately got a solution:

   ```
   Final State
   .....q..
   ..q.....
   ....q...
   .......q
   q.......
   ...q....
   .q......
   ......q.
   ```

   This is plenty of confirmation that this is a viable solution.

4. We use a bash script to run the program 3 times for every possible value for `N`. We can then graph the average of the results for every grid size (along the horizontal axis).



Exercise 2

Your answers, with explanations, to Exercise 2 go here

Exercise n

Your answers, with explanations, to Exercise n go here

To include code in your report use this

Copy code files into listings using the following commands (see .tex):

Exercise 1.1 output

```
Initial state:
......Q.
.....Q..
.....Q..
..Q.....
..Q.....
Q.......
..Q.....
..Q.....
```

```
Initial state:
.Q................................................
.............................Q....................
....................Q.............................
.............................................Q....
............................................Q.....
.................................................Q
..............Q...................................
.Q................................................
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.......Q..........................................
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......Q...........................................
...Q..............................................
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...................Q..............................
...............Q..................................
................................................q.
.............................Q....................
..........................................Q.......
.Q................................................
........Q.........................................
Q.................................................
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................................Q.................
................................Q.................
.......................Q..........................
.........Q........................................
......Q...........................................
............................................Q.....
.........................Q........................
```

```
Final State
.q......
...q....
.....q..
.......q
....Q...
Q.......
......Q.
..Q.....
```

```
Final State
...........................q......................
......................................q...........
...........................................q......
....q.............................................
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```

Main.c

```
Your code here
```

SomeFile.c

```
Some other code here
```