File - Main

```
D:\Java\jdk1.8.0_102\bin\java.exe "-javaagent:D:\IntelliJ IDEA Community Edition 2019.2\lib\
idea_rt.jar=51966:D:\IntelliJ IDEA Community Edition 2019.2\bin" -Dfile.encoding=UTF-8 -
classpath D:\Java\jdk1.8.0_102\jre\lib\charsets.jar;D:\Java\jdk1.8.0_102\jre\lib\deploy.jar;D:\
Java\jdk1.8.0_102\jre\lib\ext\access-bridge-32.jar;D:\Java\jdk1.8.0_102\jre\lib\ext\cldrdata.
jar;D:\Java\jdk1.8.0_102\jre\lib\ext\dnsns.jar;D:\Java\jdk1.8.0_102\jre\lib\ext\jaccess.jar;D:\
Java\jdk1.8.0_102\jre\lib\ext\jfxrt.jar;D:\Java\jdk1.8.0_102\jre\lib\ext\localedata.jar;D:\Java
\jdk1.8.0_102\jre\lib\ext\nashorn.jar;D:\Java\jdk1.8.0_102\jre\lib\ext\sunec.jar;D:\Java\jdk1.8
.0_102\jre\lib\ext\sunjce_provider.jar;D:\Java\jdk1.8.0_102\jre\lib\ext\sunmscapi.jar;D:\Java\
jdk1.8.0_102\jre\lib\ext\sunpkcs11.jar;D:\Java\jdk1.8.0_102\jre\lib\ext\zipfs.jar;D:\Java\jdk1.
8.0_102\jre\lib\javaws.jar;D:\Java\jdk1.8.0_102\jre\lib\jce.jar;D:\Java\jdk1.8.0_102\jre\lib\
jfr.jar;D:\Java\jdk1.8.0_102\jre\lib\jfxswt.jar;D:\Java\jdk1.8.0_102\jre\lib\jsse.jar;D:\Java\
jdk1.8.0_102\jre\lib\management-agent.jar;D:\Java\jdk1.8.0_102\jre\lib\plugin.jar;D:\Java\jdk1.
8.0_102\jre\lib\resources.jar;D:\Java\jdk1.8.0_102\jre\lib\rt.jar;D:\IntelliJ_Projects\
HillClimbingNQueens\out\production\HillClimbingNQueens edu.uncc.cci.algods.MainNQueensProblem
Please enter the number of queens (must be > 3):
8
Enter the number of runs:
300
Please select the Hill Climbing Search Method:
1. Hill Climbing Search using Steepest Ascent
2. Hill Climbing Search using Sideways Move
3. Random Restart Hill climbing Search without Sideways Move
4. Random Restart Hill climbing Search with Sideways Move
Enter choice:
1


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Initial State
Current State Heuristic Value: 11
Current State:

0 1 0 0 0 0 0 0
1 0 0 0 1 0 1 1
0 0 0 0 0 1 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0

Current State Heuristic Value: 10
Current State:

0 1 0 0 0 0 0 0
1 0 0 0 1 0 1 1
0 0 0 0 0 0 0 0
0 0 0 1 0 1 0 0
0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0

Current State Heuristic Value: 7
Current State:

0 1 0 0 0 0 0 0
1 0 0 0 1 0 0 1
0 0 0 0 0 0 0 0
0 0 0 1 0 1 0 0
0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0

Current State Heuristic Value: 4
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 1
0 0 0 0 0 0 0 0
0 0 0 1 0 1 0 0
```

```
0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0

Current State Heuristic Value: 3
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 1
0 0 0 0 0 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 1 0 0 1 0

Current State Heuristic Value: 2
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 1
0 0 1 0 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 1 0 0 1 0

Current State Heuristic Value: 1
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 1
0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 1 0 0 1 0

Current State Heuristic Value: 1
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 1
0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 1 0 0 1 0


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Initial State
Current State Heuristic Value: 8
Current State:

1 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 1 0 1 0 0
0 1 0 0 0 0 0 0
0 0 1 0 1 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 1
0 0 0 0 0 0 0 0

Current State Heuristic Value: 5
Current State:

1 0 0 0 0 0 0 0
```

```
0 0 0 0 0 0 0 0
0 0 0 1 0 1 0 0
0 1 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 1
0 0 0 0 1 0 0 0

Current State Heuristic Value: 4
Current State:

1 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 1 0 1 0 0
0 1 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 1
0 0 0 0 0 0 1 0
0 0 0 0 1 0 0 0

Current State Heuristic Value: 3
Current State:

1 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 0 1 0 1 0 0
0 1 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0

Current State Heuristic Value: 2
Current State:

1 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 0 1 0 0 0 0
0 1 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 1
0 0 0 0 0 1 0 0
0 0 0 0 1 0 0 0

Current State Heuristic Value: 2
Current State:

1 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 0 1 0 0 0 0
0 1 0 0 0 0 0 0
0 0 1 0 0 0 0 0
0 0 0 0 0 0 0 1
0 0 0 0 0 1 0 0
0 0 0 0 1 0 0 0


 ------------------------------------------------------
Initial State
Current State Heuristic Value: 8
Current State:

0 0 1 0 1 0 0 0
0 0 0 0 0 1 0 0
0 1 0 0 0 0 1 0
1 0 0 0 0 0 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0

Current State Heuristic Value: 7
```

```
Current State:

0 0 1 0 1 0 0 0
0 0 0 0 0 1 0 0
0 1 0 0 0 0 1 0
1 0 0 0 0 0 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 1

Current State Heuristic Value: 6
Current State:

0 0 1 0 1 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 0 1 0
1 1 0 0 0 0 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 1

Current State Heuristic Value: 5
Current State:

0 0 1 0 0 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 0 1 0
1 1 0 0 0 0 0 0
0 0 0 1 1 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 1

Current State Heuristic Value: 4
Current State:

0 0 1 0 0 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 0 1 0
0 1 0 0 0 0 0 0
0 0 0 1 1 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 1

Current State Heuristic Value: 2
Current State:

0 0 1 0 0 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 0 1 0
0 1 0 0 0 0 0 0
0 0 0 1 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 1

Current State Heuristic Value: 2
Current State:

0 0 1 0 0 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 0 1 0
0 1 0 0 0 0 0 0
0 0 0 1 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 1
```

```
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Initial State
Current State Heuristic Value: 10
Current State:

1 1 1 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 1 0 1
0 0 0 0 0 0 0 0
0 0 0 1 0 0 0 0
0 0 0 0 1 0 1 0
0 0 0 0 0 0 0 0

Current State Heuristic Value: 9
Current State:

1 1 1 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 1 0 1
0 0 0 0 0 0 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 0 1 0
0 0 0 0 0 0 0 0

Current State Heuristic Value: 8
Current State:

1 1 1 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0
0 0 0 0 0 1 0 1
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 0 0 0 0 0 0

Current State Heuristic Value: 7
Current State:

0 1 1 0 0 0 0 0
0 0 0 0 0 0 0 0
1 0 0 0 1 0 0 0
0 0 0 0 0 1 0 1
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 0 0 0 0 0 0

Current State Heuristic Value: 3
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0
1 0 0 0 1 0 0 0
0 0 0 0 0 1 0 1
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 1 0 0 0 0 0

Current State Heuristic Value: 2
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 0 1 0 1
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
```

```
0 0 1 0 1 0 0 0

Current State Heuristic Value: 1
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 0 1 0 1
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 1 0 0 0 0 0

Current State Heuristic Value: 1
Current State:

0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 0
1 0 0 0 0 0 0 0
0 0 0 0 0 1 0 1
0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 1 0 0 0 0 0

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Hill Climbing Search using Steepest Ascent
Number of Queens: 8
Number of Iterations: 300
Success Rate: 13%
Failure Rate: 87%
Average Number of Steps when Algorithm Succeeds: 6
Average Number of Steps when Algorithm Fails: 5

Process finished with exit code 0
```