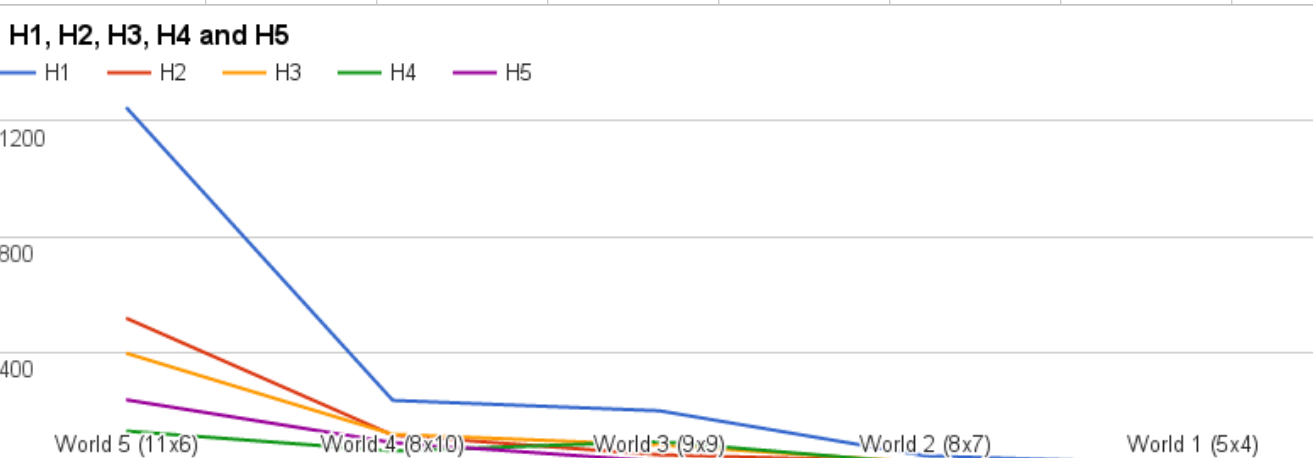


| | | | | | | | | | |
|--|------|--------------------------------------|-----|-----|-----|----|--|--------------|------------------|
| Team: Samee Swartz, Benny Peake, Nick Woodward, Alex Bittle | | | | | | | | | |
| | | Number of actions taken to find goal | | | | | | | |
| | H1 | H2 | H3 | H4 | H5 | H6 | | Score | Branching Factor |
| World 1 (5x4) | 4 | 4 | 4 | 4 | 4 | 4 | | 95 | 1.967989671 |
| World 2 (8x7) | 5 | 5 | 5 | 5 | 5 | 5 | | 93 | 2.111785765 |
| World 3 (9x9) | 7 | 7 | 7 | 7 | 7 | 7 | | 92 | 2.128604751 |
| World 4 (8x10) | 6 | 6 | 6 | 6 | 6 | 6 | | 89 | 2.482385979 |
| World 5 (11x6) | 7 | 7 | 7 | 7 | 7 | 7 | | 87 | 2.768323652 |
| | | Number of expanded nodes | | | | | | | |
| | H1 | H2 | H3 | H4 | H5 | H6 | | gain H1 & H2 | gain H5 & H6 |
| World 1 (5x4) | 15 | 11 | 14 | 11 | 11 | 6 | | 26.66666667 | 45.45454545 |
| World 2 (8x7) | 42 | 22 | 19 | 14 | 14 | 7 | | 47.61904762 | 50 |
| World 3 (9x9) | 198 | 46 | 80 | 92 | 23 | 12 | | 76.76767677 | 47.82608696 |
| World 4 (8x10) | 234 | 114 | 117 | 59 | 88 | 15 | | 51.28205128 | 82.95454545 |
| World 5 (11x6) | 1246 | 518 | 397 | 128 | 236 | 15 | | 58.42696629 | 93.6440678 |
|  | | | | | | | | | |
| make | | | | | | | | | |
| To run the program: | | | | | | | | | |
| ./program <filename> <heuristic int> | | | | | | | | | |
| We discovered a strange bug near the end of our programming. Different compilers seem to give different results for the actions taken to reach a goal. The correct sequence for the smallSampleBoard was found on VisualStudio 2013 compiler (free online) but an incorrect path was found | | | | | | | | | |

```
./program <filename> <heuristic int>
```

We discovered a strange bug near the end of our programming. Different compilers seem to give different results for the actions taken to reach a goal. The correct sequence for the smallSampleBoard was found on VisualStudio 2013 compiler (free online) but an incorrect path was found

| | | | | | | | | | |
|--|--|--|---|--|--|--|--|--|--|
| on the gcc compiler found on my ubuntu machine. | | | | | | | | | |
| | | | | | | | | | |
| We found that the a 14x12 world was too big to complete in 10 seconds so the random generator keeps the board between 3 and 12 cells for width and height. | | | | | | | | | |
| | | | | | | | | | |
| QUESTIONS: | | | | | | | | | |
| <i>How do the 5 heuristics vary in effectiveness?</i> | | | For large boards they are much more effective. For smaller boards, the show little difference from other heuristics | | | | | | |
| How much gain is there to using any heuristic (#1 vs. #2)? | | | There is a pretty significant difference between using H1 and H2. Gain is listed above. | | | | | | |
| Is #5 noticeably more effective than the other heuristics? | | | Yes. It is more noticable for larger boards with more expanded nodes. | | | | | | |
| For heuristic #6: how does its solution quality compare with #5? | | | There are generally less expanded nodes with H6 than H5. | | | | | | |
| Is it performing noticeably worse? | | | It expands less nodes and seems to find the same solution as the other heuristics for boards we've tried. | | | | | | |
| How much more efficient is it? | | | Significantly more efficient. The gain is listed above. | | | | | | |