1. Give and test five cases for the BFS and IDS program, compare and discuss the results of searched nodes and depth. The five cases should include simple and complex cases: depths of IDS should be: 5, 9, 13, 17, 21

ps. Due to computation recourses, some cases may not be solved in your computer. Then please write "N/A" for those cases.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Goal’s  depth | Start state | Goal state | BFS  depth | BFS  #node  (continue) | IDS  depth | IDS  #node |
| Example |  | 1 0 2 | 2 0 1 | 3 | 17(11) | 3 | 15(15) |
| #1 | 5 | 1 1 0 2 2 | 2 1 2 1 0 | 5 | 971(52) | 5 | 502(146) |
| #2 | 9 | 1 3 4 5 0 | 5 4 3 0 1 | 9 | 22241 (283) | 9 | 11491  (886) |
| #3 | 13 | 0 5 4 3 2 1 | 1 2 0 4 3 5 | 13 | 6014959 (1879) | 13 | 2756674  (11453) |
| #4 | 17 | 5 6 7 2 3  0 4 1 8 | 0 7 8 5 6  3 4 2 1 | 17 | "N/A" (184713) | 17 | "N/A"  (731768) |
| #5 | 21 | 0 6 5 4 3 2 1 | 1 2 5 3 0 4 6 | 21 | "N/A" (15615) | 21 | "N/A"  (298171) |

ps. Continue 的數據為**忽略**出現重複盤面後續的子結點!

2.Test your five cases for Both of the BFS and JAIDS **GRAPH\_SEARCH(G.S.) version** programs, calculate the decreasing rate of each cases.

decreasing rate = (old #nodes – new #nodes) / old #nodes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Goal’s  depth | GS BFS  depth | GS BFS  #node | Decrease  rate | GS IDS  depth | GS IDS  #node | Decrease  rate |
| Example |  | 3 | 11 | 0.35 | 3 | 15 | 1?(0) |
| #1 | 5 | 5 | 52 | 0.94 | 5 | 146 | 0.71 |
| #2 | 9 | 9 | 283 | 0.98 | 9 | 886 | 0.92 |
| #3 | 13 | 13 | 1879 | 0.999 | 13 | 11453 | 0.996 |
| #4 | 17 | 17 | 184713 | "N/A" | 17 | 731768 | "N/A" |
| #5 | 21 | 21 | 15615 | "N/A" | 21 | 298171 | "N/A" |