Assignment 2

Road Route Finding System using Prolog

By:-
Mohammad Atif Quamar
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B.tech, Computer Science and Biosciences

Depth-First Search

- Firstly, the program checks whether the destination place is the start place. If yes, then it prints the start place and outputs the distance traveled as 0.

- If not the same, then the depth search of one of the neighboring cities is carried out using recursion.

- The code is commented out for a better understanding

Best-First Search

- Firstly, the program checks whether the destination place is the start place. If yes, then it prints the start place and outputs the distance traveled as 0.

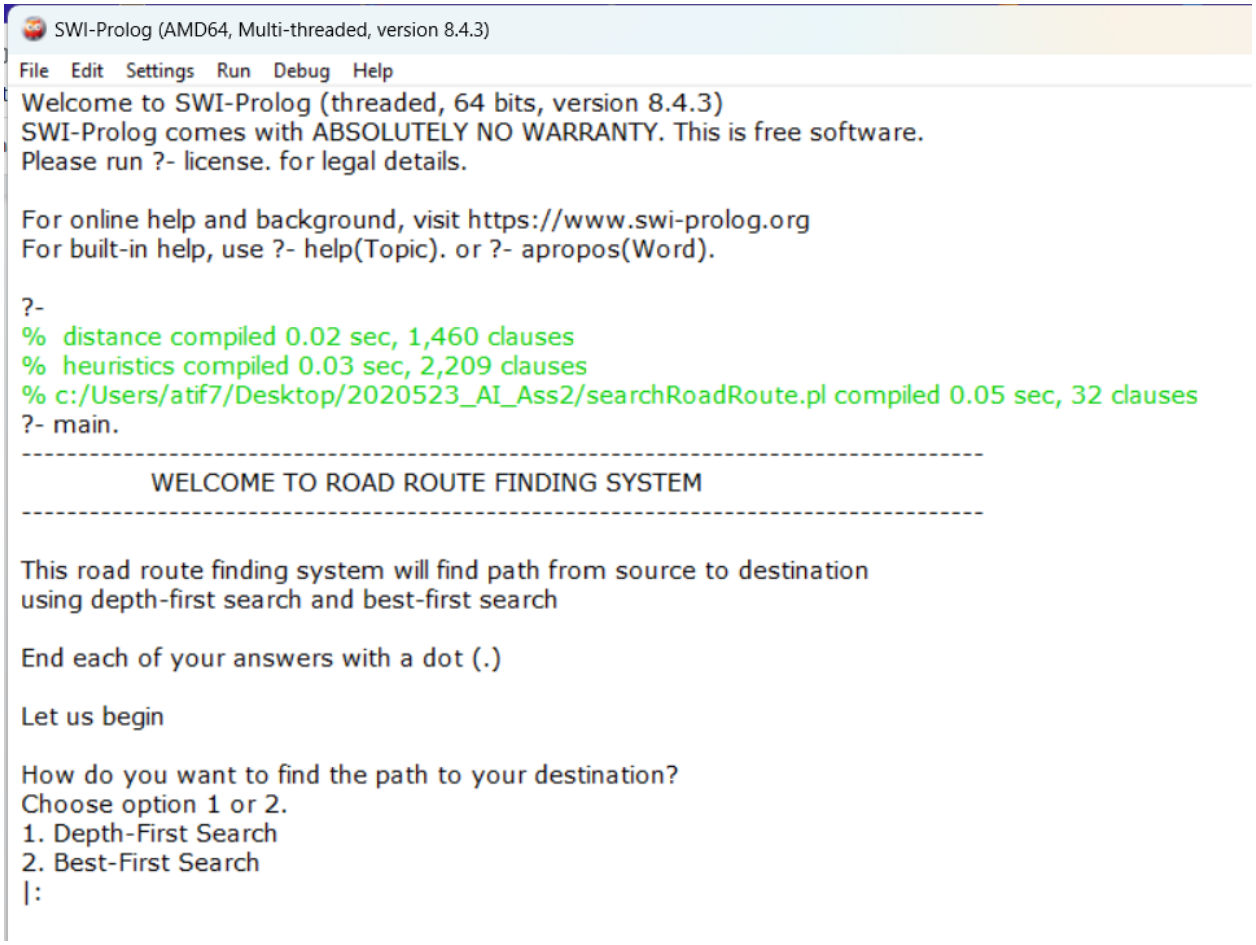
- If the current node and destination are not the same, then all the unopened nodes are sorted in ascending order according to their heuristic values which are pre-calculated. Then, the node with the least heuristic value is opened.

- The code is commented out for a better understanding

Sample Outputs

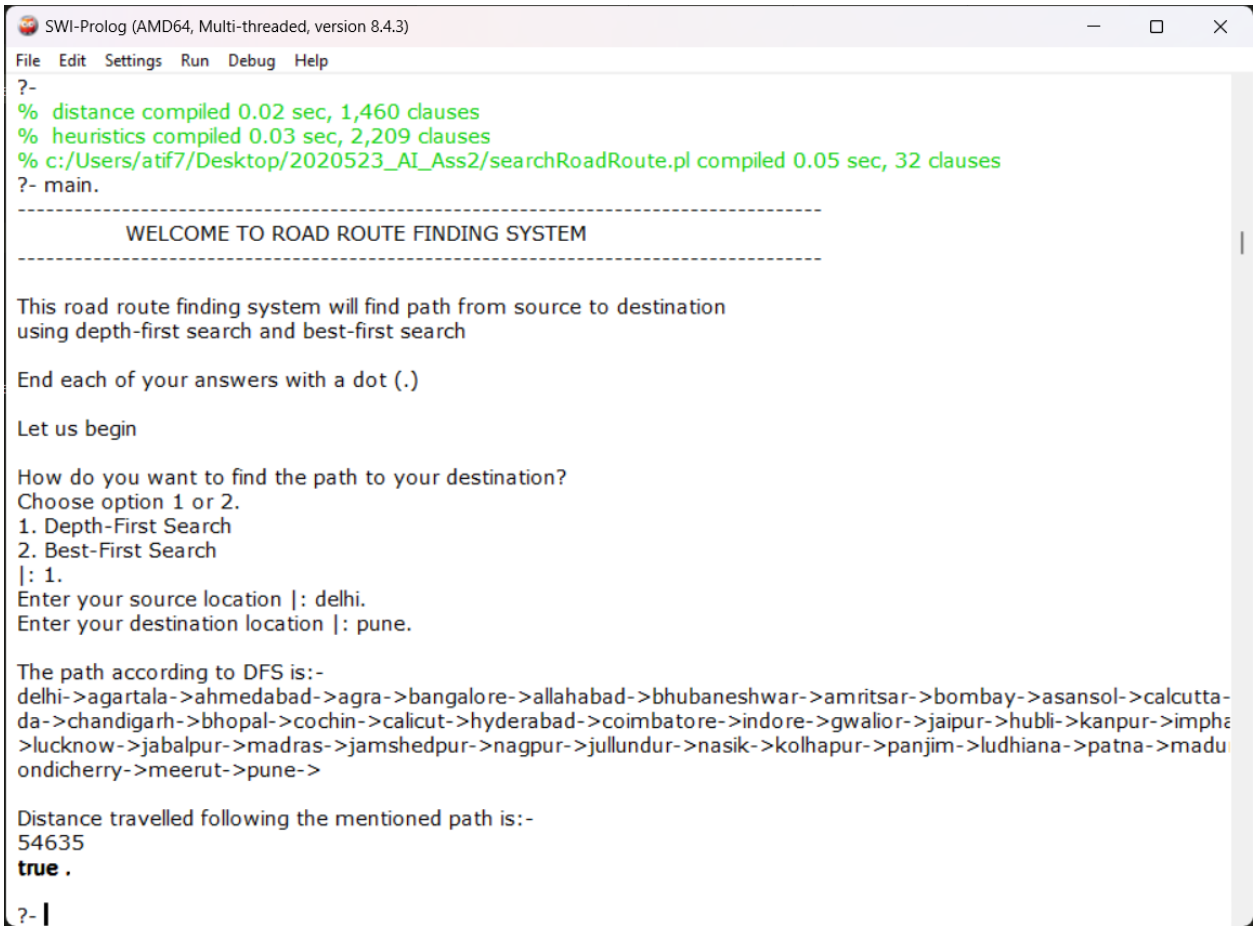
Consult the program with the file name “searchRoadRoute.pl”.
Run the main function using the command:- main.

The sample output is attached below.



The program will then ask the user to choose option 1 or 2 to select whether he/she wants to perform a depth-first search on the cities or a best-first search.
Enter “1.” for the depth-first search and “2.” for the best-first search.

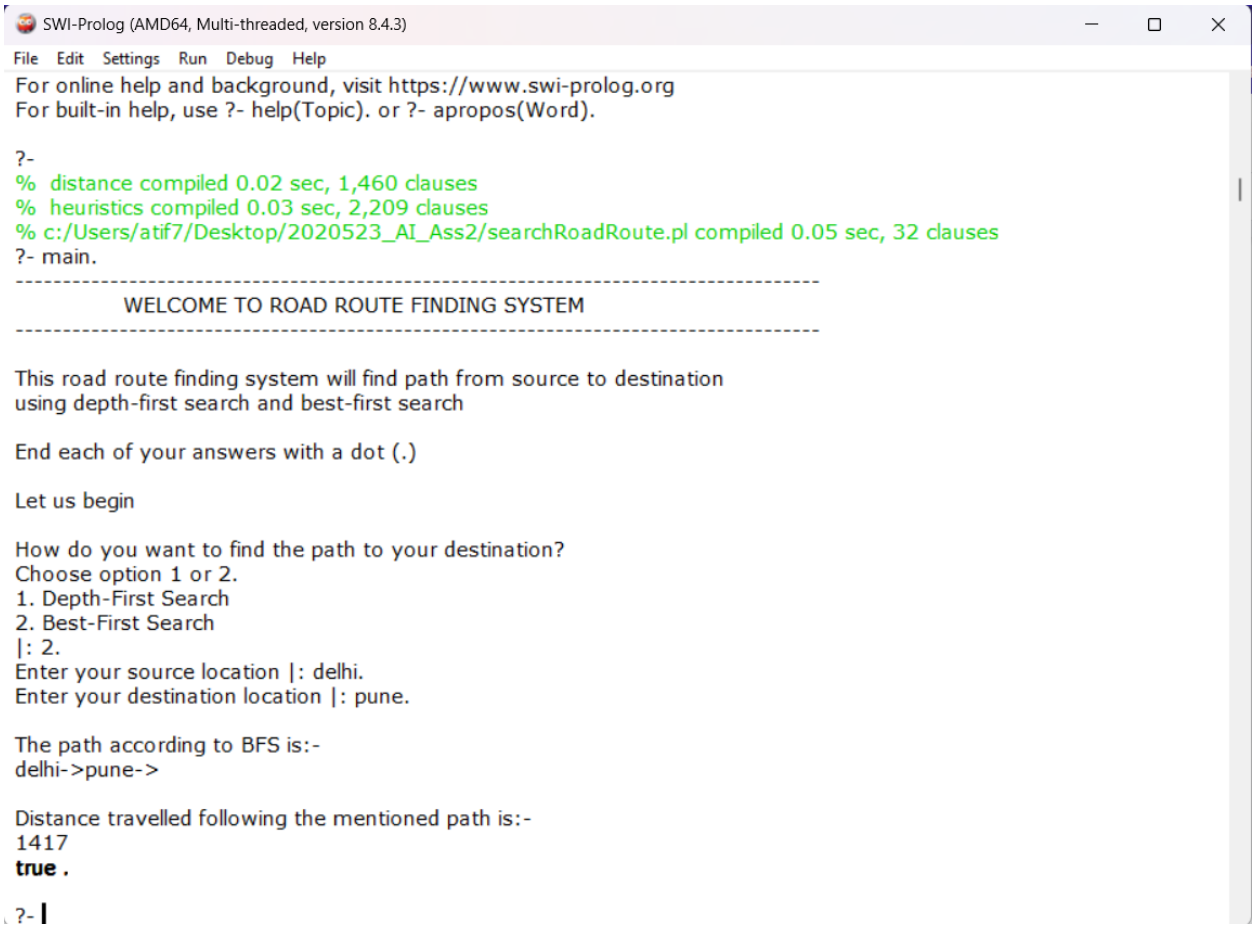
Depth-First Search



If chosen depth-first search, the program will ask the user to enter the source and destination places, respectively. Then, the program would perform a depth-first search from the source to the destination and show the path it took, the total distance one would cover while following the path.

The path generated for Delhi to Pune is a direct path with a distance of 54635, which is a much longer path.

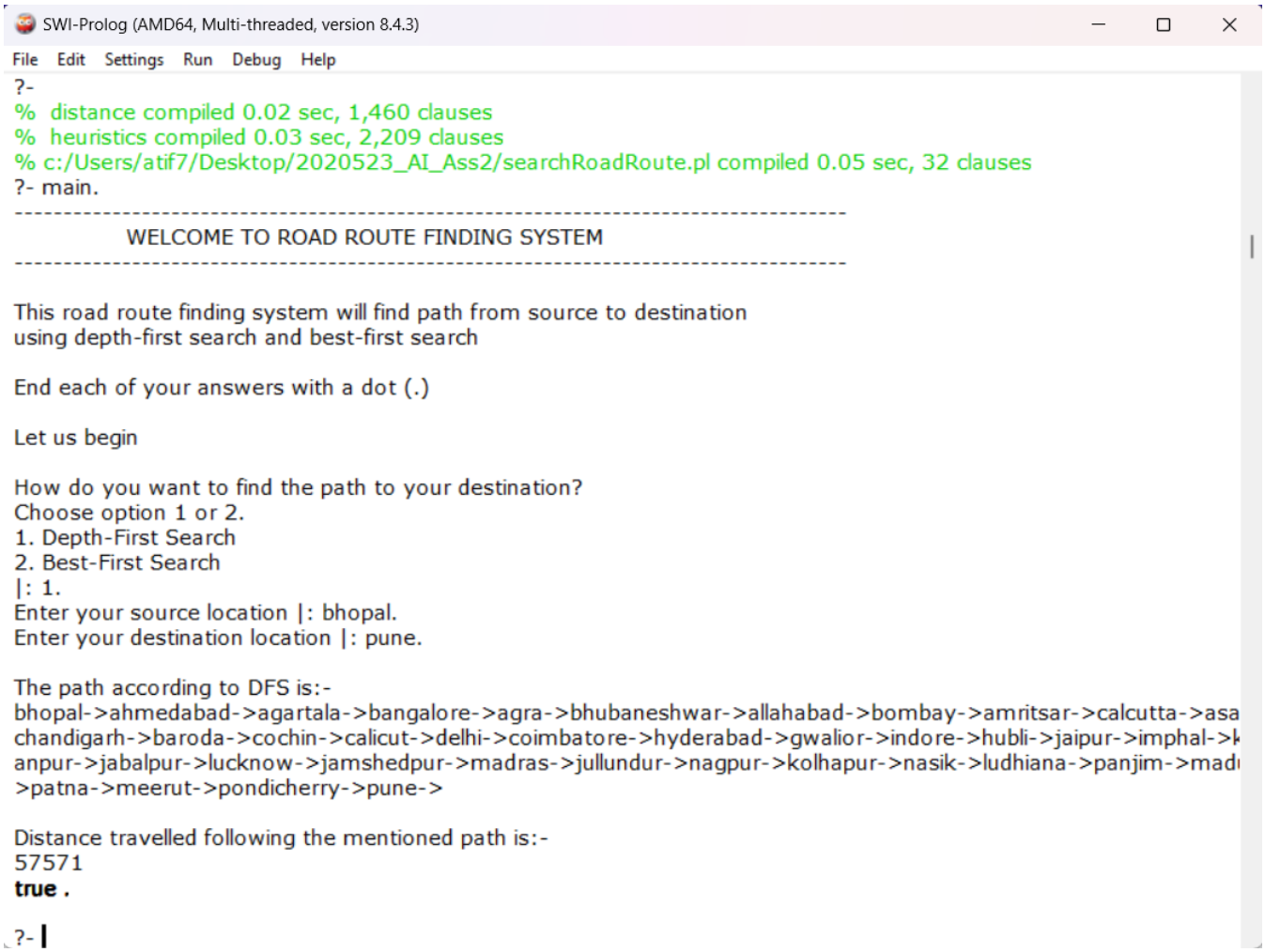
Best-First Search



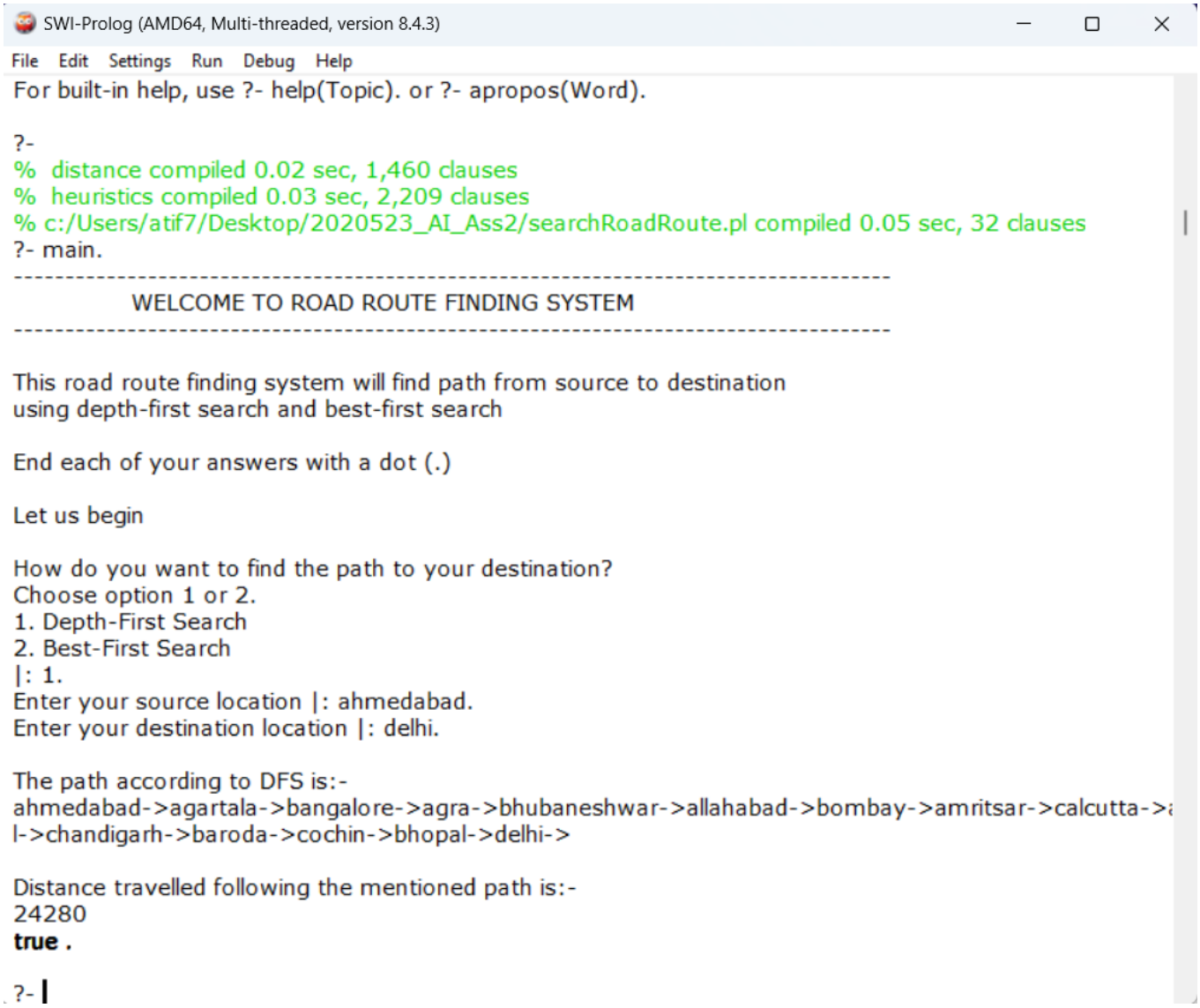
If chosen best-first search, the program will ask the user to enter the source and destination places, respectively. Then, the program would perform a best-first search from the source to the destination and show the path it took, the total distance one would cover while following the path.

The path generated for Delhi to Pune is a direct path with a distance of 1417, which is much better than the path generated due to DFS.

More sample outputs for Depth-First Search

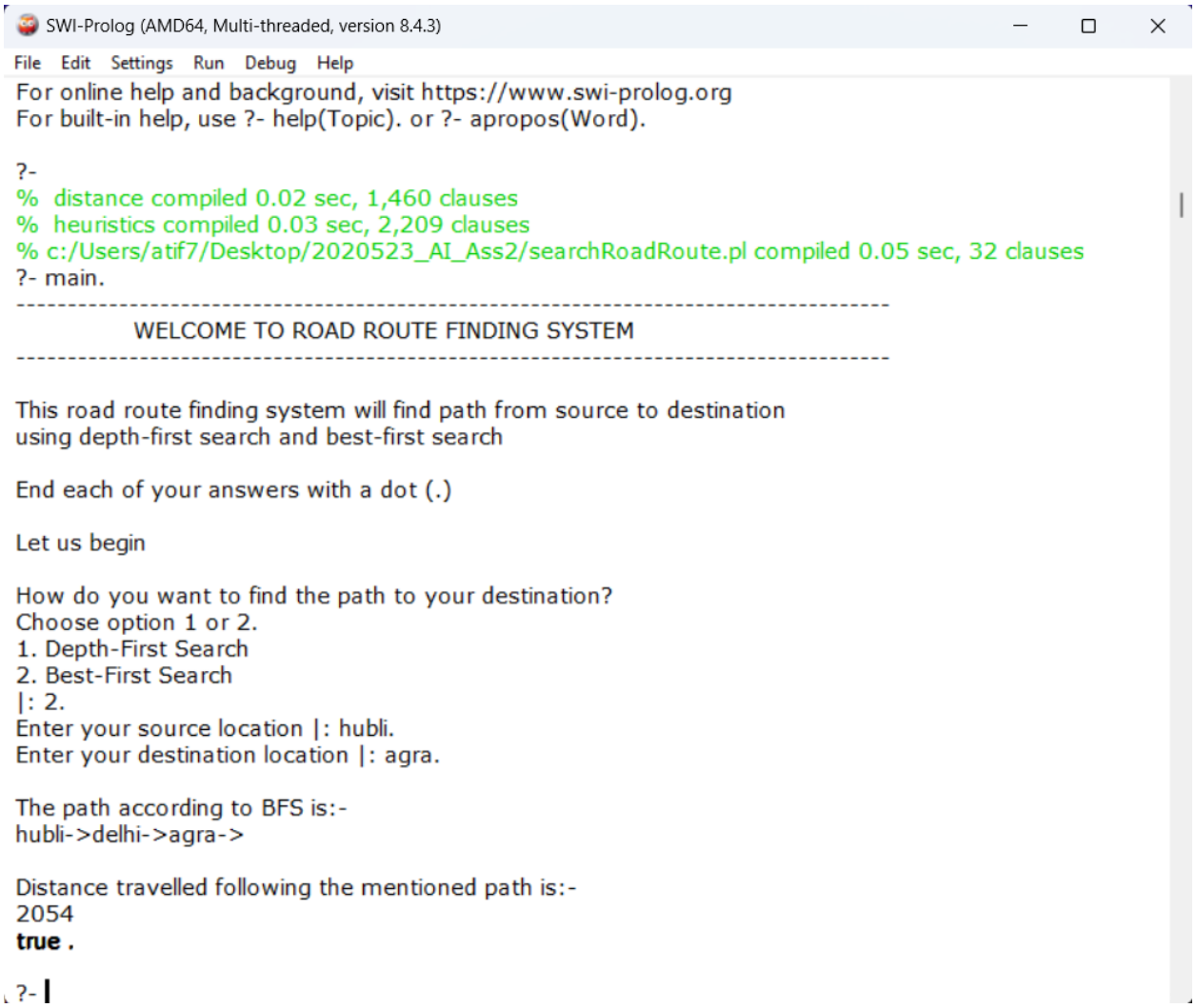


The path generated for Bhopal to Pune is a path with a distance of 57571.

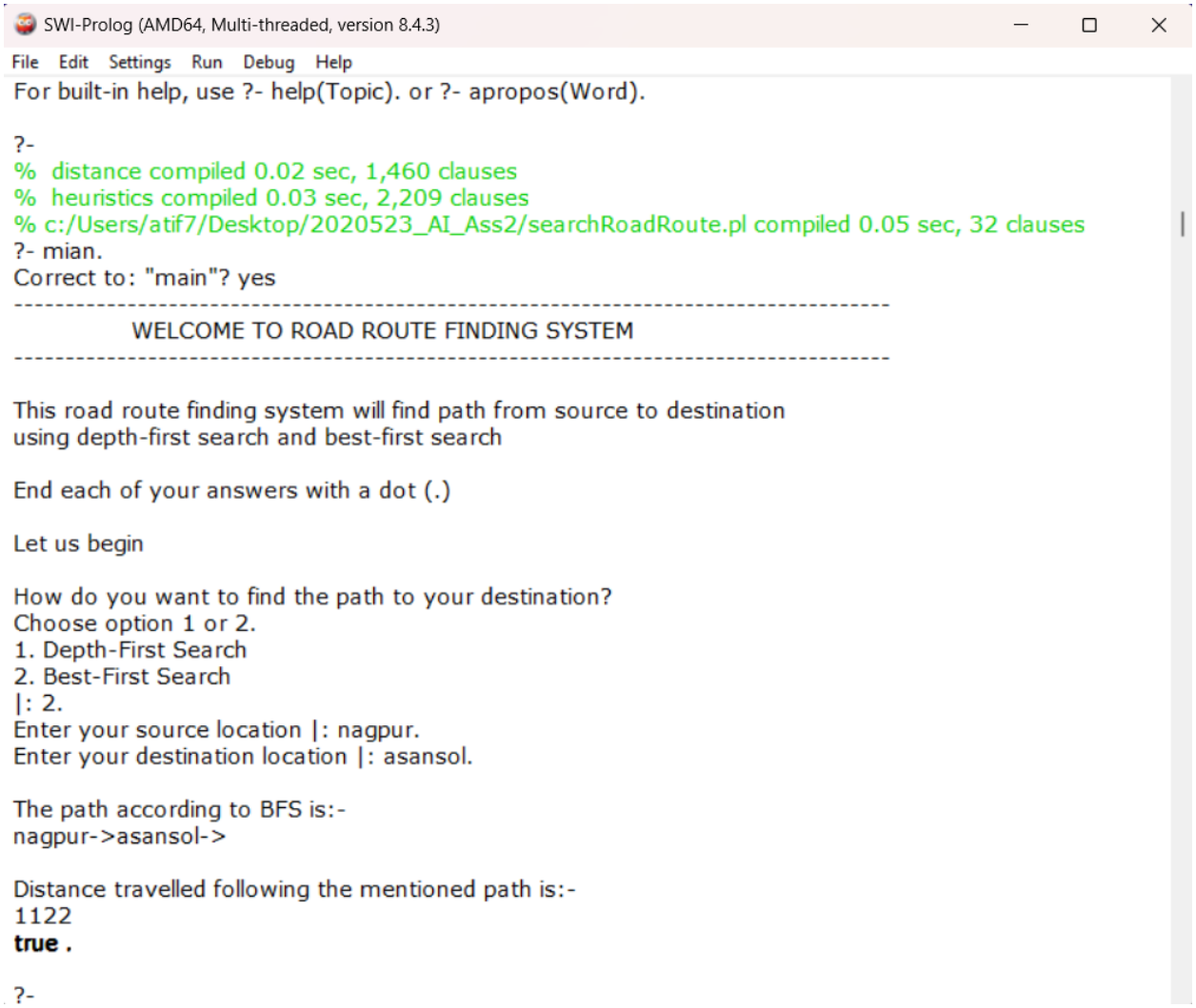


The path generated for Ahmedabad to Delhi is a path with a distance of 24280.

More sample outputs for Best-First Search



The path generated for Hubli to Agra is a path with a distance of 2054.



The path generated for Nagpur to Asansol is a path with a distance of 1122.