Assignment-2

➔ I parsed the csv file using python script, and then formatted them into facts. Using the file descriptor I wrote in the file.

➔ Query for DFS:
  ◆ *solve_dfs(bhopal,calicut,X).*
  ◆ *bestfirst(bhopal,[[calicut]],calicut,X).*

➔ Heuristic for best first search used is the straight line distance. This is found using dijkstra algo, where I'm reducing the value of shortest path by 10 to make it approx, but not exact shortest path.

➔ Working of DFS and Best first search

```
ashita@gigster:~/Documents/AI/A2$ swipl -s assign.pl
Warning: /home/ashita/Documents/AI/A2/assign.pl:4152:
Warning:    Singleton variables: [End]
Welcome to SWI-Prolog (threaded, 64 bits, version 8.4.3)
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For online help and background, visit https://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- solve_dfs(cochin,amritsar,X).
Total cost = 15335
X = [cochin, agartala, ahmedabad, agra, bangalore, allahabad, bhubaneshwar, amritsar] .

?- solve_dfs(vishakapatnam,pondicherry,X).
Total cost = 16766
X = [vishakapatnam, ahmedabad, agartala, bangalore, agra, bhubaneshwar, allahabad, bombay, amrit
r] .

?- solve_dfs(agra,delhi,X).
Total cost = 15829
X = [agra, ahmedabad, agartala, bangalore, agra, bhubaneshwar, allahabad, bombay, amritsar]
```

```
ashita@gigster:~/Documents/AI/A2$ swipl -s assign.pl
Warning: /home/ashita/Documents/AI/A2/assign.pl:4153:
Warning:    Singleton variables: [Dest]
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?- solve_dfs(agra,delhi,X).
Total cost = 25939
X = [agra, ahmedabad, agartala, bangalore, allahabad, bhubaneshwar, amritsar, bombay, asansol|...] .

?- bestfirst(delhi,[[agra]],agra,X).
Total distance = 200
X = [delhi, agra] .

?- bestfirst(delhi,[[vishakapatnam]],vishakapatnam,X).
Total distance = 1881
X = [delhi, vishakapatnam] .

?- solve_dfs(asansol,agra,X).
Total cost = 10819
X = [asansol, ahmedabad, agartala, bangalore, agra] .
```

We can clearly see that dfs just goes deeper into the level, does not give the correct path all the time, whereas best first gives a better path.

```
ashita@gigster:~/Documents/AI/A2$ swipl -s assign.pl
Warning: /home/ashita/Documents/AI/A2/assign.pl:4153:
Warning:    Singleton variables: [Dest]
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?- bestfirst(bhopal,[[agra]],agra,X).
Total distance = 1401
X = [bhopal, ahmedabad, agra] .

?- bestfirst(bhopal,[[calicut]],calicut,X).
Total distance = 2171
X = [bhopal, ahmedabad, calicut] .
```