Experiment-4

Depth First Search (DFS) and Breadth First Search (BFS)

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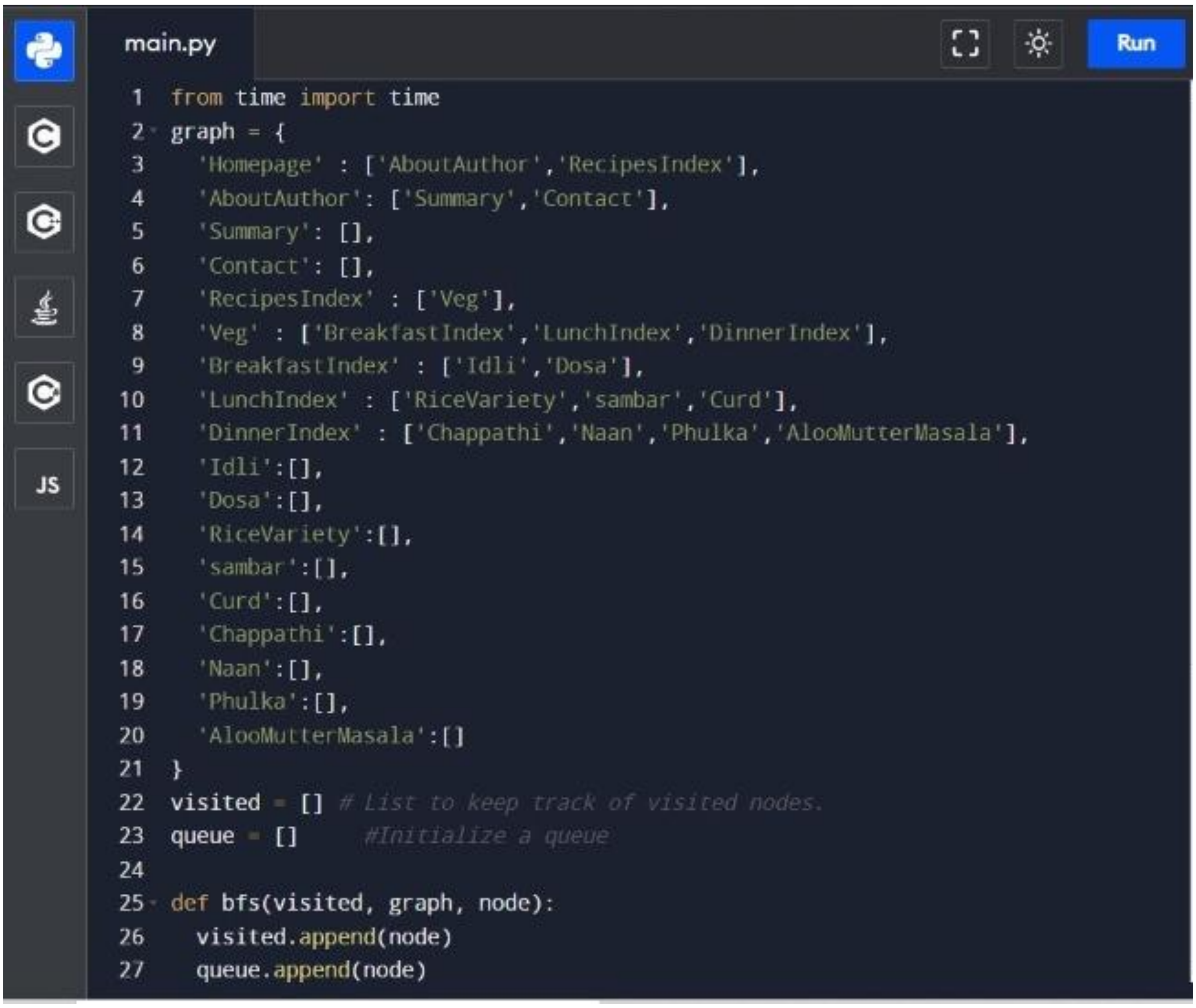
Aim: To implement and analyze DFS and BFS for an application

Problem Statement & Solution: A web crawler bot is something to search the World Wide Web automatically for Web indexing. The problem here is to show how the DFS and BFS traverse through a simple web page. The idea is to start from source page and follow all links from source and keep doing same using DFS and BFS.

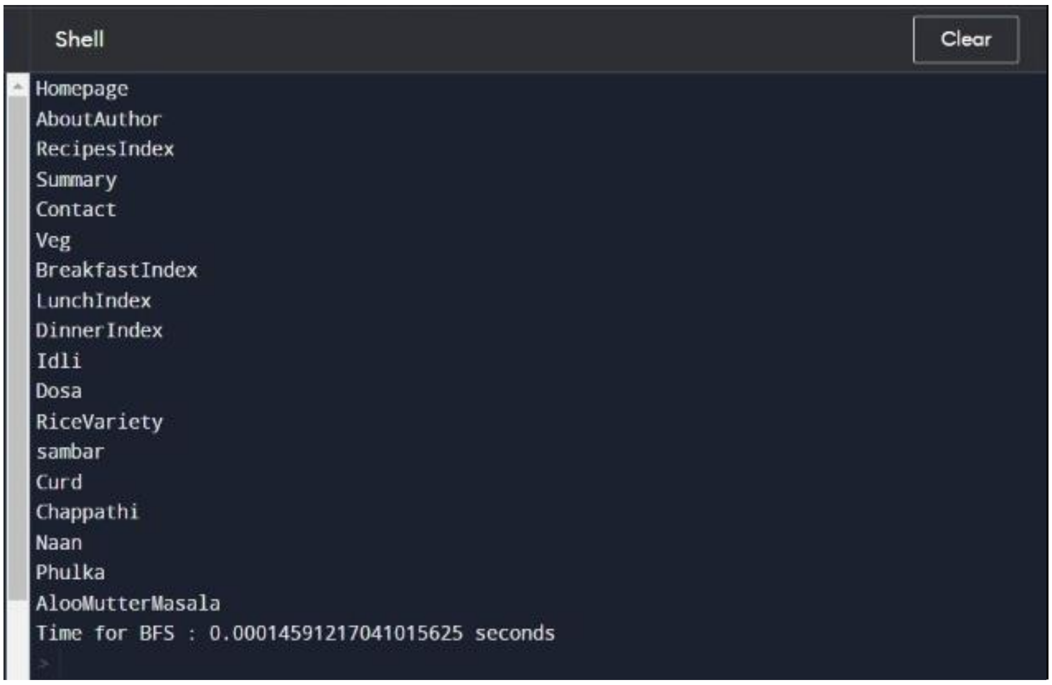
Code:

- BFS



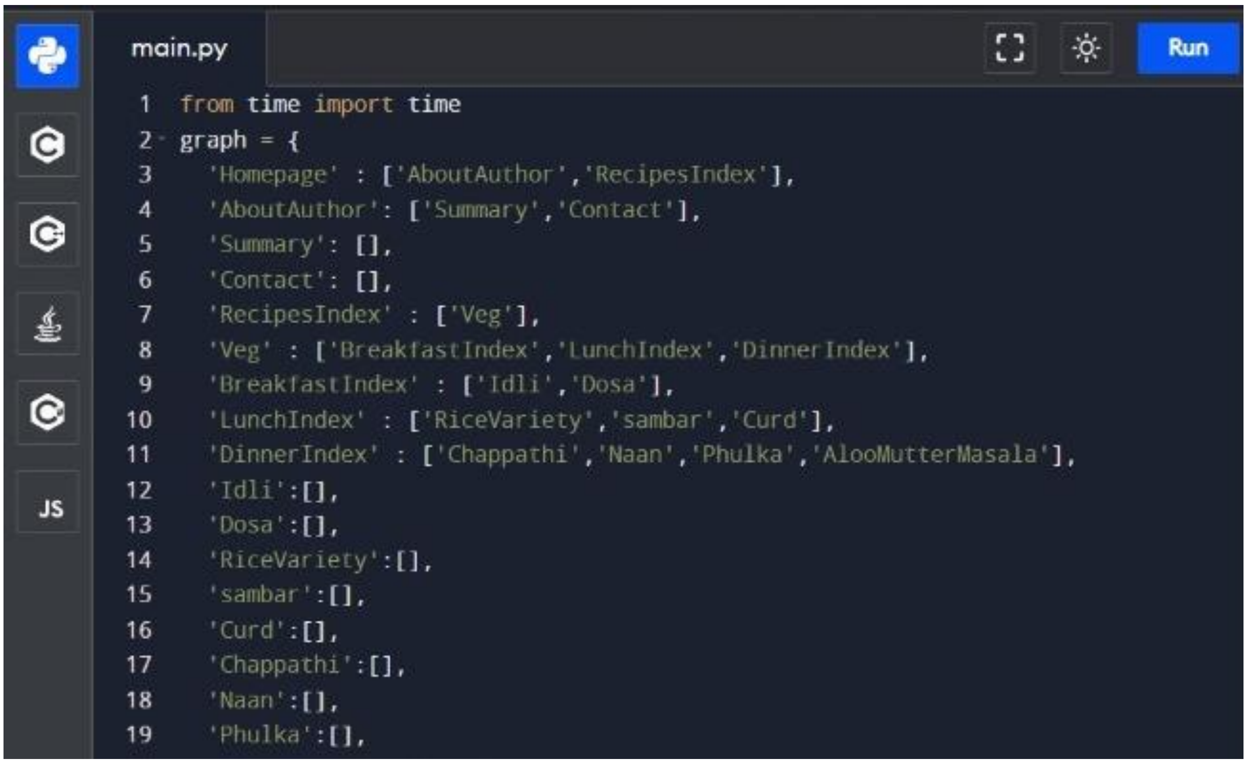
```python
from time import time
graph = {
  'Homepage' : ['AboutAuthor','RecipesIndex'],
  'AboutAuthor': ['Summary','Contact'],
  'Summary': [],
  'Contact': [],
  'RecipesIndex' : ['Veg'],
  'Veg' : ['BreakfastIndex','LunchIndex','DinnerIndex'],
  'BreakfastIndex' : ['Idli','Dosa'],
  'LunchIndex' : ['RiceVariety','sambar','Curd'],
  'DinnerIndex' : ['Chappathi','Naan','Phulka','AlooMutterMasala'],
  'Idli':[],
  'Dosa':[],
  'RiceVariety':[],
  'sambar':[],
  'Curd':[],
  'Chappathi':[],
  'Naan':[],
  'Phulka':[],
  'AlooMutterMasala':[]
}
visited = [] # List to keep track of visited nodes.
queue = []     #Initialize a queue

def bfs(visited, graph, node):
  visited.append(node)
  queue.append(node)
```

Output:



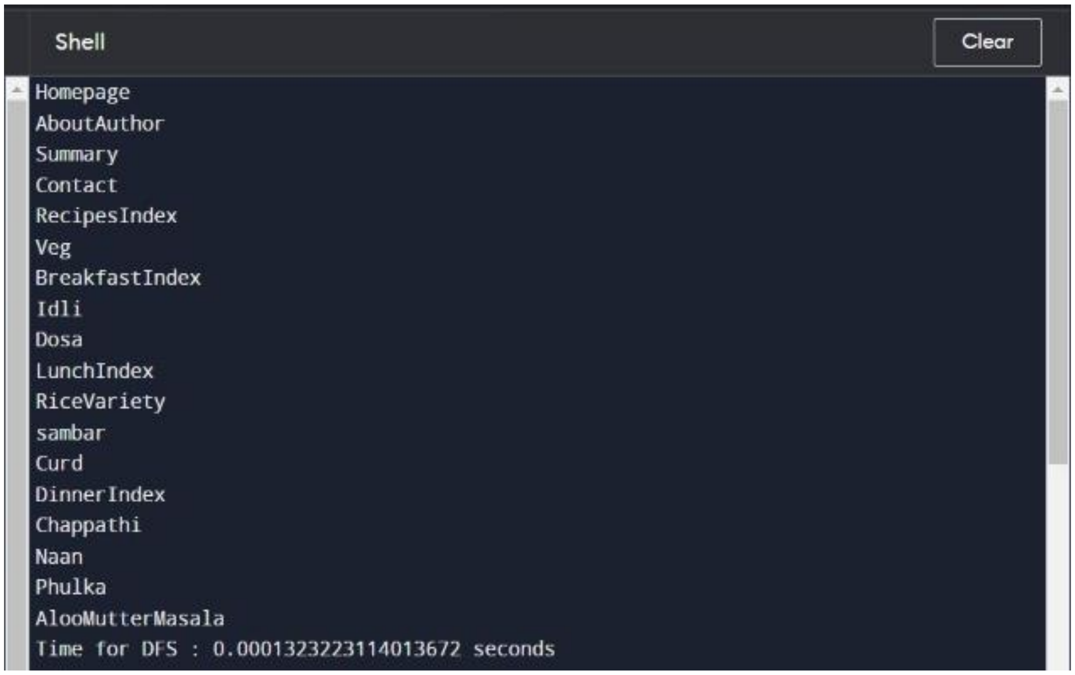
```
Homepage
AboutAuthor
RecipesIndex
Summary
Contact
Veg
BreakfastIndex
LunchIndex
DinnerIndex
Idli
Dosa
RiceVariety
sambar
Curd
Chappathi
Naan
Phulka
AlooMutterMasala
Time for BFS : 0.00014591217041015625 seconds
```

- DFS



```python
from time import time
graph = {
  'Homepage' : ['AboutAuthor','RecipesIndex'],
  'AboutAuthor': ['Summary','Contact'],
  'Summary': [],
  'Contact': [],
  'RecipesIndex' : ['Veg'],
  'Veg' : ['BreakfastIndex','LunchIndex','DinnerIndex'],
  'BreakfastIndex' : ['Idli','Dosa'],
  'LunchIndex' : ['RiceVariety','sambar','Curd'],
  'DinnerIndex' : ['Chappathi','Naan','Phulka','AlooMutterMasala'],
  'Idli':[],
  'Dosa':[],
  'RiceVariety':[],
  'sambar':[],
  'Curd':[],
  'Chappathi':[],
  'Naan':[],
  'Phulka':[],
```

Output:



```
Homepage
AboutAuthor
Summary
Contact
RecipesIndex
Veg
BreakfastIndex
Idli
Dosa
LunchIndex
RiceVariety
sambar
Curd
DinnerIndex
Chappathi
Naan
Phulka
AlooMutterMasala
Time for DFS : 0.0001323223114013672 seconds
```

Result: The programs were run successfully. From the output, it is clear that time taken to traverse the nodes using DFS is better than BFS.