project_notebook-zh

August 17, 2019

1 123

A*“Google-maps”

```
In [1]: # Run this cell first!

        from helpers import Map, load_map, show_map
        from helper import Maps, load_maps, show_maps
        from student_code import shortest_path

        %load_ext autoreload
        %autoreload 2
```

1.0.1 Map

```
In [2]: map_10 = load_map('map-10.pickle')
        show_maps(map_10)
```

show_maps(map_10)Jupyter.html
1022
MapA *intersectionsroads
Intersections
intersections
10xy

```
In [8]: map_10.intersections
```

```
Out[8]: {0: [0.7798606835438107, 0.6922727646627362],
         1: [0.7647837074641568, 0.3252670836724646],
         2: [0.7155217893995438, 0.20026498027300055],
         3: [0.7076566826610747, 0.3278339270610988],
         4: [0.8325506249953353, 0.02310946309985762],
         5: [0.49016747075266875, 0.5464878695400415],
         6: [0.8820353070895344, 0.6791919587749445],
         7: [0.46247219371675075, 0.6258061621642713],
         8: [0.11622158839385677, 0.11236327488812581],
         9: [0.1285377678230034, 0.3285840695698353]}
```

Roads

roadsi roads[i]i

```
In [9]: # this shows that intersection 0 connects to intersections 7, 6, and 5
        map_10.roads[0]
```

```
Out[9]: [7, 6, 5]
```

```
In [10]: # This shows the full connectivity of the map
         map_10.roads
```

```
Out[10]: [[7, 6, 5],
          [4, 3, 2],
          [4, 3, 1],
          [5, 4, 1, 2],
          [1, 2, 3],
          [7, 0, 3],
          [0],
          [0, 5],
          [9],
          [8]]
```

```
In [3]: # map_40 is a bigger map than map_10
        map_40 = load_map('map-40.pickle')
        show_maps(map_40)
```

show_maps(map_40)Jupyter.html

1.0.2

40039

show_map

- start - “”
- goal - “”
- path -

```
In [5]: # run this code, note the effect of including the optional
        # parameters in the function call.
        show_maps(map_40, start=5, goal=34, path=[5,16,37,12,34])
```

1.0.3

student_code.pyFile > Open

show_mappath[5, 16, 37, 12, 34]

```
In [4]:  shortest_path(map_40, 5, 34)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)

<ipython-input-4-c119dc68c5b9> in <module>()
----> 1 shortest_path(map_40, 5, 34)


/home/workspace/student_code.py in shortest_path(M, start, goal)
     29                 continue
     30
---> 31             gy = g[x] + distance(M.intersections[x], M.intersections[y])
     32             better = 0
     33             if y not in opened:


TypeError: unsupported operand type(s) for +: 'int' and 'NoneType'
```

```
In [12]: path = shortest_path(map_40, 5, 34)
         if path == [5, 16, 37, 12, 34]:
             print("great! Your code works for these inputs!")
         else:
             print("something is off, your code produced the following:")
             print(path)
```

```
great! Your code works for these inputs!
```

1.0.4

1.
2. A*
3.
4.

“”

```
In [11]: from test import test

         test(shortest_path)
```

```
All tests pass! Congratulations!
```