聚类（R树）

ID	StartLongitude	StartLatitude	EndLongitude	EndLatitude	Weight
1	114.1471844	30.61966835	114.1480724	30.62318344	1
2	114.1479039	30.62336778	114.1506518	30.62269317	1
3	114.14800519999999	30.616986404	114.15366051999999	30.61464412	5
4	114.1493696	30.61729798	114.1471844	30.61966835	1
5	114.1495543	30.57462898	114.1496903	30.57791499	1
6	114.1496351	30.57384156	114.1503603	30.57527494	1
7	114.1496903	30.57791499	114.1522655	30.55988024	1
8	114.1499331	30.61688691	114.1508827	30.61703545	1
9	114.1500182	30.57544055	114.1507472	30.57410888	1
10	114.1501958	30.5763556	114.1495543	30.57462898	1
11	114.1501977	30.5752862	114.1511911	30.57506352	1
12	114.1502116	30.61970263	114.1501176	30.61705969	1
13	114.1502657	30.57646853	114.1504817	30.57236867	1
14	114.15036496666666	30.57547834	114.15148773333333	30.575824656666665	3
15	114.1504381	30.57519478	114.1496351	30.57384156	1
16	114.1504681	30.57576795	114.1514604	30.57471896	1
17	114.1504817	30.57236867	114.1498865	30.57531571	1
18	114.1505078	30.57430534	114.1516468	30.57362225	1
19	114.150872	30.57528512	114.1522933	30.57540685	1

1.从数据库Select起始点经纬度坐标
数据时使用Order by语句将查询的数据进行排序，获得骑行
路线列表

2.for i in len(骑行路线列表):
    if i 以及算过了:
        continue
    for j in range(i+1,len(骑行路线列表):
        if j 已经算过了:
            continue
        else:
            if abs(i.longitude-j.longitude)>0.001 or
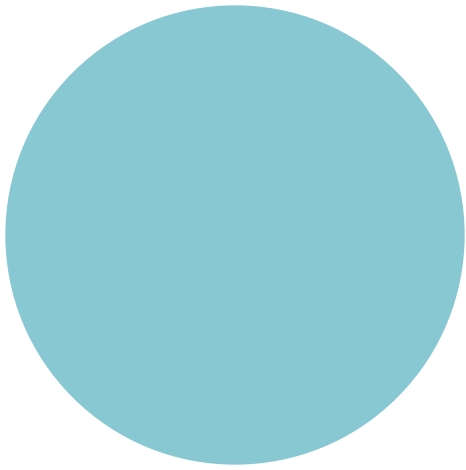   abs(i.latitude-j.latitude)>0.001:
                break
                elif abs(i.longitude-j.longitude)<0.001 and
                abs(i.latitude-j.latitude)<0.001:
                    将j加到i的列表中

OrderID	BikeID	StartTime	StartLongitude	StartLatitude	EndTime	EndLongitude	EndLatitude	Distance	StartDistance	EndDistance	TotalCyclingTime	Cost
1	0447OP	2018-02-05 15:57:22	114.2664457	30.57371786	2018-02-05 15:59:26	114.2661969	30.5723752	202	17542	17396	124	1.00
2	0447OP	2018-02-05 16:01:27	114.2661969	30.5723752	2018-02-05 16:03:27	114.2716095	30.56991259	1056	17396	17050	120	1.00
3	0447OP	2018-02-05 16:03:27	114.2716095	30.56991259	2018-02-05 16:05:29	114.2661969	30.5723752	1388	17050	17396	122	1.00
4	0447OP	2018-02-05 16:19:54	114.2661969	30.5723752	2018-02-05 16:21:56	114.2716095	30.56991259	1056	17396	17050	122	1.00
5	0447OP	2018-02-05 16:21:56	114.2716095	30.56991259	2018-02-05 16:24:08	114.2661969	30.5723752	1388	17050	17396	132	1.00
6	0447zx	2018-02-05 22:21:53	114.3726315	30.50907043	2018-02-05 22:24:02	114.3795957	30.50522961	2658	2536	1748	129	1.00
7	0447zx	2018-02-05 22:49:54	114.3795957	30.50522961	2018-02-05 22:51:58	114.3740577	30.50754631	1251	1748	2438	124	1.00
8	044yol	2018-02-05 23:17:20	114.3544669	30.57670501	2018-02-05 23:21:21	114.3627122	30.57516632	1768	12153	12015	241	1.00
9	044yol	2018-02-05 23:45:27	114.3627122	30.57516632	2018-02-05 23:49:21	114.3571826	30.57747983	2807	12015	12423	234	1.00
10	044YrL	2018-02-05 05:01:08	114.3460748	30.56791039	2018-02-05 05:03:18	114.3451524	30.56406776	476	10809	10837	130	1.00
11	044YrL	2018-02-05 17:02:23	114.3451524	30.56406776	2018-02-05 17:04:35	114.3515623	30.56558068	1860	10837	10779	132	1.00
12	044YrL	2018-02-05 17:08:51	114.3515623	30.56558068	2018-02-05 17:11:00	114.346048	30.56791533	1412	10779	10809	129	1.00
13	044YrL	2018-02-05 17:19:59	114.346048	30.56791533	2018-02-05 17:22:07	114.3515623	30.56558068	2336	10809	10779	128	1.00
14	044YrL	2018-02-05 17:24:16	114.3515623	30.56558068	2018-02-05 17:26:23	114.346048	30.56791533	1412	10779	10809	127	1.00
15	044YrL	2018-02-05 17:30:39	114.346048	30.56791533	2018-02-05 17:32:43	114.3515623	30.56558068	2336	10809	10779	124	1.00
16	044YrL	2018-02-05 17:32:43	114.3515623	30.56558068	2018-02-05 17:34:50	114.346048	30.56791533	1412	10779	10809	127	1.00
17	044Ywx	2018-02-05 15:36:15	114.3895769	30.53359194	2018-02-05 15:38:14	114.3951004	30.53131774	886	5501	4917	119	1.00
18	044Ywx	2018-02-05 15:50:59	114.3951004	30.53131774	2018-02-05 15:52:59	114.3895566	30.53361654	896	4917	5501	120	1.00
19	044Ywx	2018-02-05 15:52:59	114.3895566	30.53361654	2018-02-05 15:54:56	114.3951004	30.53131774	889	5501	4917	117	1.00
20	044Ywx	2018-02-05 16:01:00	114.3951004	30.53131774	2018-02-05 16:03:05	114.3895566	30.53361654	896	4917	5501	125	1.00
21	044Ywx	2018-02-05 16:03:05	114.3895566	30.53361654	2018-02-05 16:05:03	114.3951004	30.53131774	889	5501	4917	118	1.00
22	044Ywx	2018-02-05 16:05:03	114.3951004	30.53131774	2018-02-05 16:07:07	114.3895566	30.53361654	896	4917	5501	124	1.00
23	044yyl	2018-02-05 01:44:16	114.2608425	30.61947944	2018-02-05 01:46:26	114.2577007	30.61877663	1507	21946	22252	130	1.00
24	044yyl	2018-02-05 13:44:01	114.2577007	30.61877663	2018-02-05 13:47:51	114.2607193	30.61947904	1859	22252	21950	230	1.00
25	044YYO	2018-02-05 05:31:48	114.3143437	30.53069239	2018-02-05 05:33:47	114.3290859	30.51672294	3321	9796	7121	119	1.00

博弈实现

ID	isValid	Cost	Duration	WalkingDistance
1	0	0.00	0	0
2	0	0.00	0	0
3	1	1.00	1543	805
4	0	0.00	0	0
5	1	1.00	1543	805
6	1	2.00	1076	208
7	1	2.00	1269	466
8	1	1.00	1756	1065
9	0	0.00	0	0
10	0	0.00	0	0
11	0	0.00	0	0
12	1	2.00	1521	686
13	1	1.00	1587	829
14	1	2.00	1521	686
15	1	1.00	1587	829
16	1	2.00	1521	686
17	0	0.00	0	0
18	1	1.00	1040	482
19	0	0.00	0	0
20	1	1.00	1040	482
21	0	0.00	0	0
22	1	1.00	1040	482
23	0	0.00	0	0
24	0	0.00	0	0
25	1	1.00	1766	539

ID	StartLongitude	StartLatitude	EndLongitude	EndLatitude	type
1	114.2664457	30.57371786	114.2661969	30.5723752	1
2	114.2661969	30.5723752	114.2716095	30.56991259	1
3	114.2716095	30.56991259	114.2661969	30.5723752	1
4	114.2661969	30.5723752	114.2716095	30.56991259	1
5	114.2716095	30.56991259	114.2661969	30.5723752	1
6	114.3726315	30.50907043	114.3795957	30.50522961	1
7	114.3795957	30.50522961	114.3740577	30.50754631	1
8	114.3544669	30.57670501	114.3627122	30.57516632	1
9	114.3627122	30.57516632	114.3571826	30.57747983	1
10	114.3460748	30.56791039	114.3451524	30.56406776	1
11	114.3451524	30.56406776	114.3515623	30.56558068	1
12	114.3515623	30.56558068	114.346048	30.56791533	1
13	114.346048	30.56791533	114.3515623	30.56558068	1
14	114.3515623	30.56558068	114.346048	30.56791533	1
15	114.346048	30.56791533	114.3515623	30.56558068	1
16	114.3515623	30.56558068	114.346048	30.56791533	1
17	114.3895769	30.53359194	114.3951004	30.53131774	1
18	114.3951004	30.53131774	114.3895566	30.53361654	1
19	114.3895566	30.53361654	114.3951004	30.53131774	1
20	114.3951004	30.53131774	114.3895566	30.53361654	1
21	114.3895566	30.53361654	114.3951004	30.53131774	1
22	114.3951004	30.53131774	114.3895566	30.53361654	1
23	114.2608425	30.61947944	114.2577007	30.61877663	1
24	114.2577007	30.61877663	114.2607193	30.61947904	1
25	114.3143437	30.53069239	114.3290859	30.51672294	0

共享单车：

骑行距离、时间、花费

公交车：

步行距离、时间、花费

　　将不同类型距离化为消耗的能量进行比较，结合其他参数经过加权实现不同出行方式的选择。