Machine Learning to identify whether a vehicle is going to a correct path

Kindly take reference to the image given in the same folder

First to generate desired GPS trails I have used https://www.findlatitudeandlongitude.com/click-lat-Ing-list/#.WaalPtMjEUs)

As you can see in Raw_Data11.xlsx file the two successive columns are considered one GPS trail as you can see below

Thus the following Data have 10 GPS trail among which first 7 are for one path that the cab driver use to take and another 3 are for deviated path that it will take

The reason behind taking both the path during learning phase is that machine must have to know the desired path's that it can take during his journey

Reading the Data from the Excel file(Raw_Data11.xlsx) and Naming the columns as ["a","b","c","d","e","f","g","h","i","j","k","l","m","n","o

```
In [75]: import pandas as pd
Raw_Data = pd.ExcelFile("Raw_Data11.xlsx")
print(Raw_Data.sheet_names)
Data_Fram = Raw_Data.parse("Sheet 1")
print(Data_Fram)

['Sheet 1', 'Sheet 2']
Table 1 Unnamed: 1 Unnamed: 2 Unnamed: 3 Unnamed: 4 Unn
```

amed: 5 \					
0 NaN	NaN	NaN	NaN	NaN	
NaN 1 18.592725	73.819842	18.592765	73.819585	18.592752	73
.819571	73.019042	10.572705	73.017303	10.372732	73
2 18.592074	73.818984	18.592074	73.818727	18.592142	73
.818841	72 017054	10 501260	72 017252	10 501725	7.2
3 18.591586 .818111	73.817954	18.591260	73.817353	18.591735	73
4 18.591098	73.816838	18.590243	73.816752	18.591165	73
.817339	5 0 016 5 10	10 50000	5 0 01666 5	10 500100	= 0
5 18.589755 .817081	73.816710	18.588860	73.816667	18.590108	73
6 18.588128	73.816581	18.587518	73.816366	18.588033	73
.816652					
7 18.586176 .816223	73.816237	18.586013	73.816366	18.585959	73
8 18.584020	73.815894	18.584549	73.815894	18.584088	73
.815837					
9 18.581864	73.815551	18.583084	73.815722	18.582176	73
.815622 10 18.579993	73.815894	18.581742	73.815594	18.580589	73
.815751	, , , , , , , , , , , , , , , , , , , ,				
11 18.577877	73.815937	18.580237	73.815937	18.579043	73
.816009 12 18.575843	73.815637	18.578691	73.816109	18.577538	73
.815794	73.013037	10.570071	73.010109	10.577550	73
13 18.575437	73.814178	18.577348	73.815680	18.576033	73
.815494	73.812718	10 576047	72 015500	18.575464	72
14 18.575884 .814507	/3.012/10	18.576047	73.815508	10.5/5404	73
15 18.575681	73.811259	18.575396	73.814349	18.575748	73
.813262	7 2 22222	10 556006	5 2 010622	10 556115	= 0
16 18.575437 .811760	/3.809800	18.576006	73.812633	18.576115	73
17 18.574908	73.808470	18.575843	73.811173	18.575504	73
.809958					
18 18.574053 .808198	73.807440	18.575437	73.809543	18.574894	73
	73.806581	18.574786	73.808169	18.573714	73
.806782					
	73.807096	18.573891	73.807182	18.572819	73
.806825 21 18.571694	73.807611	18.573077	73.806882	18.571925	73
.807640	, , , , , , , , , , , , , , , , , , , ,				
22 18.570799	73.808126	18.572264	73.807783	18.570745	73
.808455 23 18.569904	73.808641	18.571124	73.808298	18.569484	73
.809571	73.000011	10.371121	73.000230	10.303101	, 5
	73.809714	18.569985	73.809028	18.568914	73
.810987 25 18.569131	73 010707	10 560121	73.810401	18.568019	73
.811417	/3.010/0/	10.303131	/3.010401	10.300013	13

26 18.568155 .811803	73.811517	18.568155	73.811173	18.566758	73
27 18.566690 .812361	73.811731	18.566934	73.811688	18.565416	73
28 18.565388 .812919	73.812160	18.565632	73.812203	18.564073	73
29 18.564168 .813477	73.812718	18.564331	73.812718	18.562730	73
30 18.562947 .814034	73.813276	18.563029	73.813233	18.561388	73
31 18.561727 .814850	73.813834	18.561727	73.813748	18.560208	73
Unnamed: 6 nnamed: 11 \	Unnamed: 7	Unnamed: 8	Unnamed: 9	Unnamed: 10	U
0 NaN NaN	NaN	NaN	NaN	NaN	
1 18.592806 73.819585	73.819499	18.592887	73.819542	18.592887	
2 18.591952 73.818812	73.818512	18.592236	73.818855	18.592236	
3 18.591301 73.818040	73.817482	18.591586	73.818083	18.591586	
4 18.590284 73.817225	73.816838	18.590935	73.816967	18.591057	
5 18.589064 73.816795	73.816710	18.589959	73.816795	18.589999	
6 18.587518 73.816667	73.816452	18.588982	73.816624	18.588820	
7 18.585688 73.816538	73.816195	18.587518	73.816495	18.587640	
8 18.583857 73.816409	73.815594	18.585972	73.816152	18.586460	
9 18.582311 73.816066	73.815336	18.584304	73.815808	18.585281	
10 18.580766 73.815765	73.815551	18.582474	73.815551	18.584101	
11 18.579220 73.815637	73.816066	18.580643	73.815637	18.582921	
12 18.577715 73.815508	73.815765	18.579138	73.816023	18.581742	
13 18.576169	73.815465	18.577837	73.815765	18.580440	
73.815722 14 18.575192	73.814650	18.576535	73.815508	18.579138	
73.816152 15 18.575965	73.813148	18.575233	73.815250	18.577837	
73.815808 16 18.576250	73.811603	18.575518	73.814092	18.576494	
73.815551 17 18.575681	73.810101	18.576087	73.812933	18.575274	
73.815379 18 18.575111 73.814220	73.808599	18.575925	73.811603	18.575396	

19	18.574257	73.807611	18.575599	73.810229	18.575965
20	.813019 18.573403	73.806667	18.575274	73.808856	18.576128
	.811731				
21 73	18.572589 .810358	73.807182	18.574582	73.808084	18.575762
22	18.571775	73.807697	18.573850	73.807397	18.575355
	.808899	73.808212	18.573118	73.806624	18.574623
23 73	18.570962 .807912	/3.808212	18.5/3118	/3.800024	18.5/4623
24	18.570148	73.808727	18.572060	73.807569	18.573809
	.806925	72 000040	10 571000	72 000241	10 570700
25	18.569334	73.809242	18.571002	73.808341	18.572792
26	.807011 18.569131	73.810616	18.569945	73.808942	18.571124
	.808298	/3.810010	18.509945	/3.808942	18.5/1124
27	18.568277	73.811388	18.569131	73.809843	18.569416
	.809714	,00011000	101303101	,01009010	100307110
28	18.567219	73.811560	18.568968	73.811216	18.567707
73	.811646				
29	18.566405	73.811774	18.567789	73.811474	18.565429
73	.812375				
30	18.565429	73.812160	18.566609	73.811731	18.562988
73	.813319				
31	18.561605	73.814092	18.565470	73.812160	18.560791
73	.814220				
				4	F 77
6	Unnamed: 12	Unnamed: 13	Unnamed: 1	4 Unnamed: 1	5 Unnamed: 1
6	\				
0		Unnamed: 13	Unnamed: 1		
0 N	\ NaN			N Na	N Na
0 N 1	\	NaN	Nal	N Na	N Na
0 N	\ NaN	NaN 73.819714	Nai 18.59272	N Na.	N Na 3 18.59278
0 N 1 6 2	NaN 18.592806	NaN 73.819714	Nai 18.59272	N Na.	N Na 3 18.59278
0 N 1 6 2 3	NaN 18.592806	NaN 73.819714 73.818898	Nal 18.592729 18.592769	N Na. 5 73.81926.5 73.81977	N Na 3 18.59278 8 18.59203
0 N 1 6 2 3 3	Nan 18.592806 18.592114 18.591626	NaN 73.819714 73.818898 73.818083	Nai 18.592729 18.592769 18.592230	N Nai 5 73.81926 5 73.81977 6 73.81986	N Na 18.59278 8 18.59203 4 18.59085
0 N 1 6 2 3 3 3	NaN 18.592806 18.592114	NaN 73.819714 73.818898 73.818083	Nai 18.592729 18.592769 18.592230	N Nai 5 73.81926 5 73.81977 6 73.81986	N Na 18.59278 8 18.59203 4 18.59085
0 N 1 6 2 3 3 4 6	NaN 18.592806 18.592114 18.591626 18.591138	NaN 73.819714 73.818898 73.818083 73.817225	Nai 18.592729 18.592769 18.592239 18.591549	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977
0 N 1 6 2 3 3 4 6 5	Nan 18.592806 18.592114 18.591626	NaN 73.819714 73.818898 73.818083 73.817225	Nai 18.592729 18.592769 18.592239 18.591549	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977
0 N 1 6 2 3 3 4 6 5 8	NaN 18.592806 18.592114 18.591626 18.591138 18.590243	NaN 73.819714 73.818898 73.818083 73.817225 73.816924	Nai 18.592729 18.592769 18.592239 18.591549 18.590549	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871
0 N 1 6 2 3 3 4 6 5 8 6	NaN 18.592806 18.592114 18.591626 18.591138	NaN 73.819714 73.818898 73.818083 73.817225 73.816924	Nai 18.592729 18.592769 18.592239 18.591549 18.590549	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871
0 N 1 6 2 3 3 4 6 5 8 6 0	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795	Nai 18.592729 18.592769 18.592230 18.591549 18.590549	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766
0 N 1 6 2 3 3 4 6 5 8 6 0 7	NaN 18.592806 18.592114 18.591626 18.591138 18.590243	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795	Nai 18.592729 18.592769 18.592239 18.591549 18.590549	N Nat 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348 18.588454	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667	Nat 18.592725 18.592765 18.592236 18.591545 18.590545 18.589226 18.587725	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3 8	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667	Nat 18.592725 18.592765 18.592236 18.591545 18.590545 18.589226 18.587725	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3 8 0	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348 18.588454 18.587396	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667 73.816409	Nai 18.592725 18.592765 18.592236 18.591545 18.590545 18.589226 18.587725 18.586216	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050 6 73.82115	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660 1 18.58583
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3 8 0 9	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348 18.588454	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667 73.816409	Nai 18.592725 18.592765 18.592236 18.591545 18.590545 18.589226 18.587725 18.586216	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050 6 73.82115	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660 1 18.58583
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3 8 0 9 6	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348 18.588454 18.587396	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667 73.816409 73.816237	Nai 18.592725 18.592765 18.592236 18.591545 18.590545 18.589226 18.587725 18.586216	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050 6 73.82115 8 73.82228	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660 1 18.58583 9 18.58499
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3 8 0 9	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348 18.588454 18.587396 18.586338	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667 73.816409 73.816237	Nat 18.592725 18.592765 18.592236 18.591545 18.590546 18.589226 18.587725 18.586216 18.585136	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050 6 73.82115 8 73.82228	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660 1 18.58583 9 18.58499
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3 8 0 9 6 10	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348 18.588454 18.587396 18.586338 18.585281	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667 73.816409 73.816237 73.816066	Nat 18.592729 18.592769 18.592230 18.591549 18.590549 18.589220 18.587729 18.586210 18.585139	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050 6 73.82115 8 73.82228	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660 1 18.58583 9 18.58499 6 18.58408
0 N 1 6 2 3 3 4 6 5 8 6 0 7 3 8 0 9 6 10 10 10 10 10 10 10 10 10 10 10 10 10	NaN 18.592806 18.592114 18.591626 18.591138 18.590243 18.589348 18.588454 18.587396 18.586338 18.585281	NaN 73.819714 73.818898 73.818083 73.817225 73.816924 73.816795 73.816667 73.816409 73.816237 73.816066	Nat 18.592729 18.592769 18.592230 18.591549 18.590549 18.589220 18.587729 18.586210 18.585139	N Nai 5 73.81926 5 73.81977 6 73.81986 5 73.81971 8 73.81956 6 73.81986 1 73.82050 6 73.82115 8 73.82228 9 73.82357	N Na 18.59278 8 18.59203 4 18.59085 4 18.58977 3 18.58871 4 18.58766 8 18.58660 1 18.58583 9 18.58499 6 18.58408

12 6	18.583166	73.815722	18.582230	73.824112	18.58259
13 0	18.582108	73.815551	18.581823	73.822589	18.58223
14 3	18.581050	73.815594	18.581213	73.821473	18.58182
15 2	18.579993	73.815637	18.580481	73.820357	18.58113
16 9	18.578935	73.815894	18.579565	73.819585	18.58035
17 1	18.577755	73.815765	18.578264	73.819520	18.57930
18 5	18.576454	73.815465	18.576759	73.819692	18.57775
19 9	18.575233	73.815165	18.575843	73.818705	18.57620
20 1	18.575559	73.813620	18.575599	73.816988	18.57570
21 8	18.576047	73.812075	18.575477	73.814006	18.57549
22 4	18.575640	73.810616	18.575925	73.811302	18.57588
23 6	18.575274	73.808942	18.575355	73.809114	18.57600
24 6	18.574582	73.808084	18.574521	73.808084	18.57541
25 9	18.573891	73.807225	18.573789	73.806968	18.57500
26 5	18.572711	73.807096	18.573708	73.806496	18.57417
27 0	18.571247	73.807955	18.572874	73.806860	18.57324
28 4	18.569701	73.809543	18.571857	73.807676	18.57167
29	18.568033	73.811345	18.570840	73.808491	18.56978
30 5	18.565022	73.812418	18.569619	73.809478	18.56878
31 3	18.561239	73.814135	18.568928	73.810852	18.56624
•	Unnamed: 17	Unnamed: 18	Unnamed: 19		
0	NaN	NaN	NaN		
1	73.819349	18.567260	73.815680		
2	73.819714	18.592887	73.819370		
3	73.819563	18.591748	73.819799		
4	73.819671	18.590528	73.819542		
5	73.820014	18.589348	73.819971		
6	73.820465	18.587965	73.820357		
7	73.820980	18.586949	73.820958		
8	73.821666	18.585932	73.821688		
9	73.822546	18.584915	73.822546		
10	73.823404	18.583898	73.823447		

```
11
      73.824263
                    18.582881
                                  73.824348
12
      73.823876
                    18.582149
                                  73.823190
      73.824112
                                  73.821902
13
                    18.581457
14
      73.822653
                    18.580643
                                  73.820443
15
      73.821473
                    18.579301
                                  73.819499
16
      73.820314
                    18.578081
                                  73.819714
17
      73.819542
                    18.576738
                                  73.819799
18
      73.819628
                    18.575925
                                  73.818941
19
      73.819735
                    18.575518
                                  73.817225
      73.817697
20
                    18.575437
                                  73.815207
21
      73.815207
                    18.575884
                                  73.812976
22
      73.812847
                    18.575681
                                  73.810787
23
      73.811388
                    18.575315
                                  73.808770
24
      73.809929
                    18.574338
                                  73.807826
25
      73.808470
                    18.573525
                                  73.806453
26
      73.807890
                    18.572548
                                  73.807311
27
      73.806946
                    18.571043
                                  73.808041
28
      73.807998
                    18.569823
                                  73.809071
      73.809371
                                  73.810530
29
                    18.569294
30
      73.811452
                    18.568562
                                  73.811431
31
      73.812075
                    18.566202
                                  73.812032
```

	a	b	С	d	е	
f	\					
1 71	18.592725	73.819842	18.592765	73.819585	18.592752	73.8195
2 41	18.592074	73.818984	18.592074	73.818727	18.592142	73.8188
3 11	18.591586	73.817954	18.591260	73.817353	18.591735	73.8181
4 39	18.591098	73.816838	18.590243	73.816752	18.591165	73.8173
5 81	18.589755	73.816710	18.588860	73.816667	18.590108	73.8170
6 52	18.588128	73.816581	18.587518	73.816366	18.588033	73.8166
7 23	18.586176	73.816237	18.586013	73.816366	18.585959	73.8162
8 37	18.584020	73.815894	18.584549	73.815894	18.584088	73.8158
9 22	18.581864	73.815551	18.583084	73.815722	18.582176	73.8156
10 51	18.579993	73.815894	18.581742	73.815594	18.580589	73.8157
11 09	18.577877	73.815937	18.580237	73.815937	18.579043	73.8160
12 94	18.575843	73.815637	18.578691	73.816109	18.577538	73.8157

13 94	18.575437	73.814178	18.577348	73.815680	18.576033	73.8154
14 07	18.575884	73.812718	18.576047	73.815508	18.575464	73.8145
15 62	18.575681	73.811259	18.575396	73.814349	18.575748	73.8132
16 60	18.575437	73.809800	18.576006	73.812633	18.576115	73.8117
17 58	18.574908	73.808470	18.575843	73.811173	18.575504	73.8099
18 98	18.574053	73.807440	18.575437	73.809543	18.574894	73.8081
19 82	18.573484	73.806581	18.574786	73.808169	18.573714	73.8067
20 25	18.572589	73.807096	18.573891	73.807182	18.572819	73.8068
21 40	18.571694	73.807611	18.573077	73.806882	18.571925	73.8076
22 55	18.570799	73.808126	18.572264	73.807783	18.570745	73.8084
23 71	18.569904	73.808641	18.571124	73.808298	18.569484	73.8095
24 87	18.569497	73.809714	18.569985	73.809028	18.568914	73.8109
25 17	18.569131	73.810787	18.569131	73.810401	18.568019	73.8114
26 03	18.568155	73.811517	18.568155	73.811173	18.566758	73.8118
27 61	18.566690	73.811731	18.566934	73.811688	18.565416	73.8123
28 19	18.565388	73.812160	18.565632	73.812203	18.564073	73.8129
29 77	18.564168	73.812718	18.564331	73.812718	18.562730	73.8134
30 34	18.562947	73.813276	18.563029	73.813233	18.561388	73.8140
31 50	18.561727	73.813834	18.561727	73.813748	18.560208	73.8148
	g	h	i	j	k	
1	18.592806	73.819499	18.592887	73.819542	18.592887	73.8195
85 2	18.591952	73.818512	18.592236	73.818855	18.592236	73.8188
12	18.591301	73.817482	18.591586	73.818083	18.591586	73.8180
40	18.590284	73.816838	18.590935	73.816967	18.591057	73.8172
25 5 95	18.589064	73.816710	18.589959	73.816795	18.589999	73.8167
95 6 67	18.587518	73.816452	18.588982	73.816624	18.588820	73.8166

_	10 505600	E2 01610E	10 505510	E2 01640E	10 505640	5 0 0165
7 38	18.585688	73.816195	18.587518	73.816495	18.587640	73.8165
8 09	18.583857	73.815594	18.585972	73.816152	18.586460	73.8164
9 66	18.582311	73.815336	18.584304	73.815808	18.585281	73.8160
10 65	18.580766	73.815551	18.582474	73.815551	18.584101	73.8157
11 37	18.579220	73.816066	18.580643	73.815637	18.582921	73.8156
12 08	18.577715	73.815765	18.579138	73.816023	18.581742	73.8155
13 22	18.576169	73.815465	18.577837	73.815765	18.580440	73.8157
14 52	18.575192	73.814650	18.576535	73.815508	18.579138	73.8161
15 08	18.575965	73.813148	18.575233	73.815250	18.577837	73.8158
16 51	18.576250	73.811603	18.575518	73.814092	18.576494	73.8155
17 79	18.575681	73.810101	18.576087	73.812933	18.575274	73.8153
18 20	18.575111	73.808599	18.575925	73.811603	18.575396	73.8142
19 19	18.574257	73.807611	18.575599	73.810229	18.575965	73.8130
20 31	18.573403	73.806667	18.575274	73.808856	18.576128	73.8117
21 58	18.572589	73.807182	18.574582	73.808084	18.575762	73.8103
22 99	18.571775	73.807697	18.573850	73.807397	18.575355	73.8088
23 12	18.570962	73.808212	18.573118	73.806624	18.574623	73.8079
24 25	18.570148	73.808727	18.572060	73.807569	18.573809	73.8069
25 11	18.569334	73.809242	18.571002	73.808341	18.572792	73.8070
26 98	18.569131	73.810616	18.569945	73.808942	18.571124	73.8082
27 14	18.568277	73.811388	18.569131	73.809843	18.569416	73.8097
28 46	18.567219	73.811560	18.568968	73.811216	18.567707	73.8116
29 75	18.566405	73.811774	18.567789	73.811474	18.565429	73.8123
30 19	18.565429	73.812160	18.566609	73.811731	18.562988	73.8133
31 20	18.561605	73.814092	18.565470	73.812160	18.560791	73.8142
r	m	n	О	р	q	
	•					

1 49	18.592806	73.819714	18.592725	73.819263	18.592786	73.8193
2 14	18.592114	73.818898	18.592765	73.819778	18.592033	73.8197
3	18.591626	73.818083	18.592236	73.819864	18.590853	73.8195
4 71	18.591138	73.817225	18.591545	73.819714	18.589776	73.8196
5 14	18.590243	73.816924	18.590548	73.819563	18.588718	73.8200
6 65	18.589348	73.816795	18.589226	73.819864	18.587660	73.8204
7 80	18.588454	73.816667	18.587721	73.820508	18.586603	73.8209
8 66	18.587396	73.816409	18.586216	73.821151	18.585830	73.8216
9 46	18.586338	73.816237	18.585138	73.822289	18.584996	73.8225
10 04	18.585281	73.816066	18.583999	73.823576	18.584081	73.8234
11 63	18.584223	73.815894	18.582921	73.824542	18.583166	73.8242
12 76	18.583166	73.815722	18.582230	73.824112	18.582596	73.8238
13 12	18.582108	73.815551	18.581823	73.822589	18.582230	73.8241
14 53	18.581050	73.815594	18.581213	73.821473	18.581823	73.8226
15 73	18.579993	73.815637	18.580481	73.820357	18.581132	73.8214
16 14	18.578935	73.815894	18.579565	73.819585	18.580359	73.8203
17 42	18.577755	73.815765	18.578264	73.819520	18.579301	73.8195
18 28	18.576454	73.815465	18.576759	73.819692	18.577755	73.8196
19 35	18.575233	73.815165	18.575843	73.818705	18.576209	73.8197
20 97	18.575559	73.813620	18.575599	73.816988	18.575701	73.8176
21 07	18.576047	73.812075	18.575477	73.814006	18.575498	73.8152
22 47	18.575640	73.810616	18.575925	73.811302	18.575884	73.8128
23 88	18.575274	73.808942	18.575355	73.809114	18.576006	73.8113
24 29	18.574582	73.808084	18.574521	73.808084	18.575416	73.8099
25 70	18.573891	73.807225	18.573789	73.806968	18.575009	73.8084
26 90	18.572711	73.807096	18.573708	73.806496	18.574175	73.8078
27	18.571247	73.807955	18.572874	73.806860	18.573240	73.8069

```
46
28
    18.569701
                73.809543
                            18.571857
                                        73.807676
                                                    18.571674
                                                                73.8079
98
29
    18.568033
                73.811345
                            18.570840
                                        73.808491
                                                    18.569782
                                                                73.8093
71
30
    18.565022
                73.812418
                            18.569619
                                        73.809478
                                                    18.568785
                                                                73.8114
52
31
    18.561239
                73.814135
                            18.568928
                                        73.810852
                                                    18.566243
                                                                73.8120
75
                         t
             S
1
    18.567260
                73.815680
2
    18.592887
                73.819370
3
    18.591748
                73.819799
4
    18.590528
                73.819542
5
    18.589348
                73.819971
6
    18.587965
                73.820357
7
    18.586949
                73.820958
                73.821688
8
    18.585932
9
    18.584915
                73.822546
10
    18.583898
                73.823447
11
    18.582881
                73.824348
12
    18.582149
                73.823190
13
    18.581457
                73.821902
14
    18.580643
                73.820443
15
    18.579301
                73.819499
16
    18.578081
                73.819714
17
    18.576738
                73.819799
18
    18.575925
                73.818941
19
    18.575518
                73.817225
20
    18.575437
                73.815207
21
    18.575884
                73.812976
22
    18.575681
                73.810787
23
    18.575315
                73.808770
24
    18.574338
                73.807826
25
    18.573525
                73.806453
26
    18.572548
                73.807311
27
    18.571043
                73.808041
28
    18.569823
                73.809071
29
    18.569294
                73.810530
30
    18.568562
                73.811431
    18.566202
31
                73.812032
```

Now the data-frame is converted to a list within list's and each list identify some coordinate on map

As the successive lists are generated horizontally among first row in our data frame ie there are 20 columns and each two column of first row gives us an coordinate on map that means we have 10 coordinates among which we have first 7 are from one path and other 3 are from deviated path, so that's how the below list is generated

```
In [77]: from sklearn import svm
    import numpy as np
    x = Data.values.tolist()
    initial_data = []
    final_data = []
    for row in x:
        initial_data.append([row[i:i+2] for i in range(0, len(row), 2)
    ])
    for y in initial_data:
        for z in y:
            final_data.append(z)
        print(final_data)
```

[[18.592725, 73.819842], [18.592765, 73.819585], [18.592752, 73.81 9571], [18.592806, 73.819499], [18.592887, 73.819542], [18.592887, 73.819585], [18.592806, 73.819714], [18.592725, 73.819263], [18.59 2786, 73.819349], [18.56726, 73.81568], [18.592074, 73.818984], [1 8.592074, 73.818727], [18.592142, 73.818841], [18.591952, 73.81851 2], [18.592236, 73.818855], [18.592236, 73.818812], [18.592114, 73 .818898], [18.592765, 73.819778], [18.592033, 73.819714], [18.5928 87, 73.81937], [18.591586, 73.817954], [18.59126, 73.817353], [18. 591735, 73.818111], [18.591301, 73.817482], [18.591586, 73.818083] , [18.591586, 73.81804], [18.591626, 73.818083], [18.592236, 73.81 9864], [18.590853, 73.819563], [18.591748, 73.819799], [18.591098, 73.816838], [18.590243, 73.816752], [18.591165, 73.817339], [18.59 0284, 73.816838], [18.590935, 73.816967], [18.591057, 73.817225], [18.591138, 73.817225], [18.591545, 73.819714], [18.589776, 73.819 671], [18.590528, 73.819542], [18.589755, 73.81671], [18.58886, 73 .816667], [18.590108, 73.817081], [18.589064, 73.81671], [18.58995 9, 73.816795], [18.589999, 73.816795], [18.590243, 73.816924], [18 .590548, 73.819563], [18.588718, 73.820014], [18.589348, 73.819971], [18.588128, 73.816581], [18.587518, 73.816366], [18.588033, 73. 816652], [18.587518, 73.816452], [18.588982, 73.816624], [18.58882 , 73.816667], [18.589348, 73.816795], [18.589226, 73.819864], [18.

58766, 73.820465], [18.587965, 73.820357], [18.586176, 73.816237], [18.586013, 73.816366], [18.585959, 73.816223], [18.585688, 73.816 195], [18.587518, 73.816495], [18.58764, 73.816538], [18.588454, 7 3.816667], [18.587721, 73.820508], [18.586603, 73.82098], [18.5869 49, 73.820958], [18.58402, 73.815894], [18.584549, 73.815894], [18 .584088, 73.815837], [18.583857, 73.815594], [18.585972, 73.816152], [18.58646, 73.816409], [18.587396, 73.816409], [18.586216, 73.8 21151], [18.58583, 73.821666], [18.585932, 73.821688], [18.581864, 73.815551], [18.583084, 73.815722], [18.582176, 73.815622], [18.58 2311, 73.815336], [18.584304, 73.815808], [18.585281, 73.816066], [18.586338, 73.816237], [18.585138, 73.822289], [18.584996, 73.822 546], [18.584915, 73.822546], [18.579993, 73.815894], [18.581742, 73.815594], [18.580589, 73.815751], [18.580766, 73.815551], [18.58 2474, 73.815551], [18.584101, 73.815765], [18.585281, 73.816066], [18.583999, 73.823576], [18.584081, 73.823404], [18.583898, 73.823 447], [18.577877, 73.815937], [18.580237, 73.815937], [18.579043, 73.816009], [18.57922, 73.816066], [18.580643, 73.815637], [18.582 921, 73.815637], [18.584223, 73.815894], [18.582921, 73.824542], [18.583166, 73.824263], [18.582881, 73.824348], [18.575843, 73.8156 37], [18.578691, 73.816109], [18.577538, 73.815794], [18.577715, 7 3.815765], [18.579138, 73.816023], [18.581742, 73.815508], [18.583 166, 73.815722], [18.58223, 73.824112], [18.582596, 73.823876], [1 8.582149, 73.82319], [18.575437, 73.814178], [18.577348, 73.81568] , [18.576033, 73.815494], [18.576169, 73.815465], [18.577837, 73.8 15765], [18.58044, 73.815722], [18.582108, 73.815551], [18.581823, 73.822589], [18.58223, 73.824112], [18.581457, 73.821902], [18.575 884, 73.812718], [18.576047, 73.815508], [18.575464, 73.814507], [18.575192, 73.81465], [18.576535, 73.815508], [18.579138, 73.81615 2], [18.58105, 73.815594], [18.581213, 73.821473], [18.581823, 73. 822653], [18.580643, 73.820443], [18.575681, 73.811259], [18.57539 6, 73.814349], [18.575748, 73.813262], [18.575965, 73.813148], [18 .575233, 73.81525], [18.577837, 73.815808], [18.579993, 73.815637] , [18.580481, 73.820357], [18.581132, 73.821473], [18.579301, 73.8 19499], [18.575437, 73.8098], [18.576006, 73.812633], [18.576115, 73.81176], [18.57625, 73.811603], [18.575518, 73.814092], [18.5764 94, 73.815551], [18.578935, 73.815894], [18.579565, 73.819585], [1 8.580359, 73.820314], [18.578081, 73.819714], [18.574908, 73.80847], [18.575843, 73.811173], [18.575504, 73.809958], [18.575681, 73. 810101], [18.576087, 73.812933], [18.575274, 73.815379], [18.57775 5, 73.815765], [18.578264, 73.81952], [18.579301, 73.819542], [18. 576738, 73.819799], [18.574053, 73.80744], [18.575437, 73.809543], [18.574894, 73.808198], [18.575111, 73.808599], [18.575925, 73.811 603], [18.575396, 73.81422], [18.576454, 73.815465], [18.576759, 7 3.819692], [18.577755, 73.819628], [18.575925, 73.818941], [18.573 484, 73.806581], [18.574786, 73.808169], [18.573714, 73.806782], [18.574257, 73.807611], [18.575599, 73.810229], [18.575965, 73.8130 19], [18.575233, 73.815165], [18.575843, 73.818705], [18.576209, 7 3.819735], [18.575518, 73.817225], [18.572589, 73.807096], [18.573 891, 73.807182], [18.572819, 73.806825], [18.573403, 73.806667], [18.575274, 73.808856], [18.576128, 73.811731], [18.575559, 73.8136 2], [18.575599, 73.816988], [18.575701, 73.817697], [18.575437, 73 .815207], [18.571694, 73.807611], [18.573077, 73.806882], [18.5719 25, 73.80764], [18.572589, 73.807182], [18.574582, 73.808084], [18

.575762, 73.810358], [18.576047, 73.812075], [18.575477, 73.814006], [18.575498, 73.815207], [18.575884, 73.812976], [18.570799, 73. 808126], [18.572264, 73.807783], [18.570745, 73.808455], [18.57177 5, 73.807697], [18.57385, 73.807397], [18.575355, 73.808899], [18. 57564, 73.810616], [18.575925, 73.811302], [18.575884, 73.812847], [18.575681, 73.810787], [18.569904, 73.808641], [18.571124, 73.808 298], [18.569484, 73.809571], [18.570962, 73.808212], [18.573118, 73.806624], [18.574623, 73.807912], [18.575274, 73.808942], [18.57 5355, 73.809114], [18.576006, 73.811388], [18.575315, 73.80877], [18.569497, 73.809714], [18.569985, 73.809028], [18.568914, 73.8109 87], [18.570148, 73.808727], [18.57206, 73.807569], [18.573809, 73 .806925], [18.574582, 73.808084], [18.574521, 73.808084], [18.5754 16, 73.809929], [18.574338, 73.807826], [18.569131, 73.810787], [1 8.569131, 73.810401], [18.568019, 73.811417], [18.569334, 73.80924 2], [18.571002, 73.808341], [18.572792, 73.807011], [18.573891, 73 .807225], [18.573789, 73.806968], [18.575009, 73.80847], [18.57352 5, 73.806453], [18.568155, 73.811517], [18.568155, 73.811173], [18 .566758, 73.811803], [18.569131, 73.810616], [18.569945, 73.808942], [18.571124, 73.808298], [18.572711, 73.807096], [18.573708, 73. 806496], [18.574175, 73.80789], [18.572548, 73.807311], [18.56669, 73.811731], [18.566934, 73.811688], [18.565416, 73.812361], [18.56 8277, 73.811388], [18.569131, 73.809843], [18.569416, 73.809714], [18.571247, 73.807955], [18.572874, 73.80686], [18.57324, 73.80694 6], [18.571043, 73.808041], [18.565388, 73.81216], [18.565632, 73. 812203], [18.564073, 73.812919], [18.567219, 73.81156], [18.568968 , 73.811216], [18.567707, 73.811646], [18.569701, 73.809543], [18. 571857, 73.807676], [18.571674, 73.807998], [18.569823, 73.809071] , [18.564168, 73.812718], [18.564331, 73.812718], [18.56273, 73.81 3477], [18.566405, 73.811774], [18.567789, 73.811474], [18.565429, 73.812375], [18.568033, 73.811345], [18.57084, 73.808491], [18.569 782, 73.809371], [18.569294, 73.81053], [18.562947, 73.813276], [1 8.563029, 73.813233], [18.561388, 73.814034], [18.565429, 73.81216], [18.566609, 73.811731], [18.562988, 73.813319], [18.565022, 73. 812418], [18.569619, 73.809478], [18.568785, 73.811452], [18.56856 2, 73.811431, [18.561727, 73.813834], [18.561727, 73.813748], [18 .560208, 73.81485], [18.561605, 73.814092], [18.56547, 73.81216], [18.560791, 73.81422], [18.561239, 73.814135], [18.568928, 73.8108 52], [18.566243, 73.812075], [18.566202, 73.812032]]

Clustering of Data is to be done for learning process

As I mentioned above the first 7 coordinate belong to one path which is clustered to "0" cluster and next 3 belongs to cluster on "1"

So the desired output is generated using nested for loop

K nearest neighbor Algorithm is used for learning and prediction

As the learning is completed now we can run the test to get the desired result

```
In [80]: import pandas as pd
Raw_Data = pd.ExcelFile("Raw_Data11.xlsx")
print(Raw_Data.sheet_names)
Data_Fram = Raw_Data.parse("Sheet 2")
print(Data_Fram)
```

['Sheet 1', 'Sheet 2'] Table 1 Unnamed: 1 0 18.592752 73.819313 1 18.591491 73.819699 2 18.589986 73.819613 3 18.588806 73.820043 4 18.587626 73.820601 5 18.586447 73.821158 6 18.585552 73.821974 18.584494 7 73.822961 8 18.583437 73.824120 9 18.581850 73.822789 10 18.580020 73.820171 11 18.577986 73.819699 12 18.576318 73.819656 13 18.575789 73.818026 14 18.575382 73.816094 15 18.575504 73.813648 16 18.575952 73.811159 17 18.575423 73.809056 18 18.574203 73.807726 73.807082 19 18.572494 20 18.570826 73.808413 21 18.569443 73.810430 22 18.567612 73.811932 23 18.565375 73.812575 24 18.563137 73.813219 25 18.560900 73.814163 26 18.558744 73.815966 27 18.556587 73.817768 28 18.554431 73.819571 29 18.552275 73.821373

```
In [81]: test_Data = Data_Fram[1:]
    test_Data.columns = ["a","b"]
    print(test_Data)
```

```
b
1
    18.591491
                73.819699
2
    18.589986
                73.819613
3
    18.588806
                73.820043
4
    18.587626
                73.820601
5
    18.586447
                73.821158
6
    18.585552
                73.821974
    18.584494
7
                73.822961
8
    18.583437
                73.824120
9
    18.581850
                73.822789
10
    18.580020
                73.820171
11
    18.577986
                73.819699
12
    18.576318
                73.819656
13
    18.575789
                73.818026
14
    18.575382
                73.816094
15
    18.575504
                73.813648
                73.811159
16
    18.575952
17
    18.575423
                73.809056
18
    18.574203
                73.807726
19
    18.572494
                73.807082
20
    18.570826
                73.808413
21
    18.569443
                73.810430
22
    18.567612
                73.811932
23
    18.565375
                73.812575
24
    18.563137
                73.813219
25
    18.560900
                73.814163
26
    18.558744
                73.815966
27
    18.556587
                73.817768
28
    18.554431
                73.819571
29
    18.552275
                73.821373
```

```
In [82]: from sklearn import svm
    import numpy as np
    x = test_Data.values.tolist()
    initial_data = []
    final_test_data = []
    for row in x:
        initial_data.append([row[i:i+2] for i in range(0, len(row), 2)
    ])
    for y in initial_data:
        for z in y:
            final_test_data.append(z)
        print(final_test_data)
```

[[18.591491, 73.819699], [18.589986, 73.819613], [18.588806, 73.82 0043], [18.587626, 73.820601], [18.586447, 73.821158], [18.585552, 73.821974], [18.584494, 73.822961], [18.583437, 73.82412], [18.581 85, 73.822789], [18.58002, 73.820171], [18.577986, 73.819699], [18.576318, 73.819656], [18.575789, 73.818026], [18.575382, 73.816094], [18.575504, 73.813648], [18.575952, 73.811159], [18.575423, 73.809056], [18.574203, 73.807726], [18.572494, 73.807082], [18.570826, 73.808413], [18.569443, 73.81043], [18.567612, 73.811932], [18.565375, 73.812575], [18.563137, 73.813219], [18.5609, 73.814163], [18.558744, 73.815966], [18.556587, 73.817768], [18.554431, 73.819571], [18.552275, 73.821373]]

Now the output is an array of 0 and 1 means in the above list or coordinates first 13 coordinates belong to 1 cluster ie it is traveling from the deviated path and after some point, it will come back to the first path

```
In [85]: knn.predict(final_test_data)
Out[85]: array([1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])
```