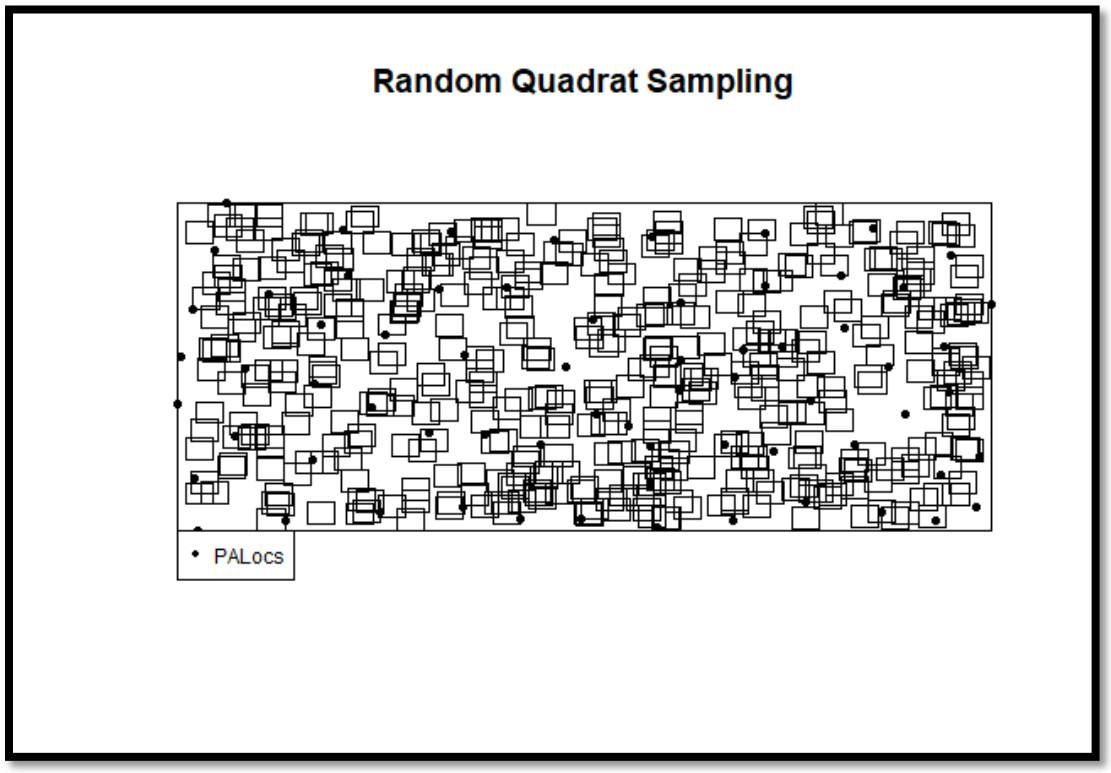
INFSCI 2809-MIDTERM

Submitted By Vaishnavi Deshpande

PART-A

- Random Quadrat Sampling for PALocations: Dimension of grid- 30*15



μ = 0.14

Variance is 0.1206682

VMR is 0.8619154

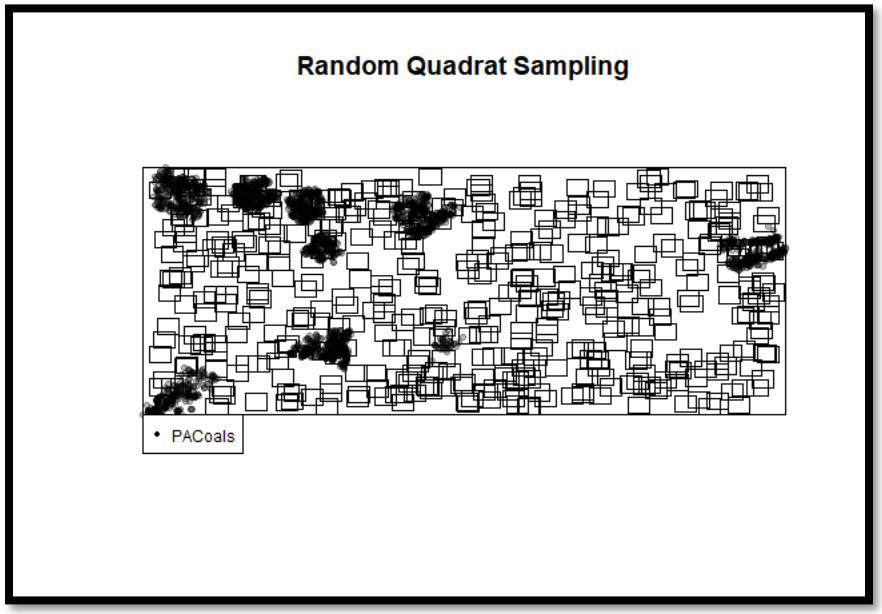
No. of Events (K)	Number of Quadrants (X)	$K - \mu$	$(K - \mu)2$	$X(K - \mu)2$
0	387	-0.14	0.0196	7.5852
1	63	0.86	0.7396	46.5948
			Total	54.18

The VMR value of 0.8619154 which is smaller than 1 indicates that the data is **evenly scattered.**

I also tried for the dimension of 25*10 and I got the VMR of around 0.7550201

PA Coal

Random Quadrat Sampling for PA Coal: Dimension of grid- 30*15



μ - 6.042222

Variance – 348.8512

VMR-57.73558

Table:

No. of Events (K)	Number of Quadrants (X)	$K - \mu$	$(K - \mu)2$	$X(K - \mu)2$
0	376	-6.042222222	36.50844938	13727.17697
1	6	-5.042222222	25.42400494	152.5440296
2	5	-4.042222222	16.33956049	81.69780247
3	2	-3.042222222	9.255116049	18.5102321
4	1	-2.042222222	4.170671605	4.170671605
5	3	-1.042222222	1.08622716	3.258681481
7	2	0.957777778	0.917338272	1.834676543
8	4	1.957777778	3.832893827	15.33157531

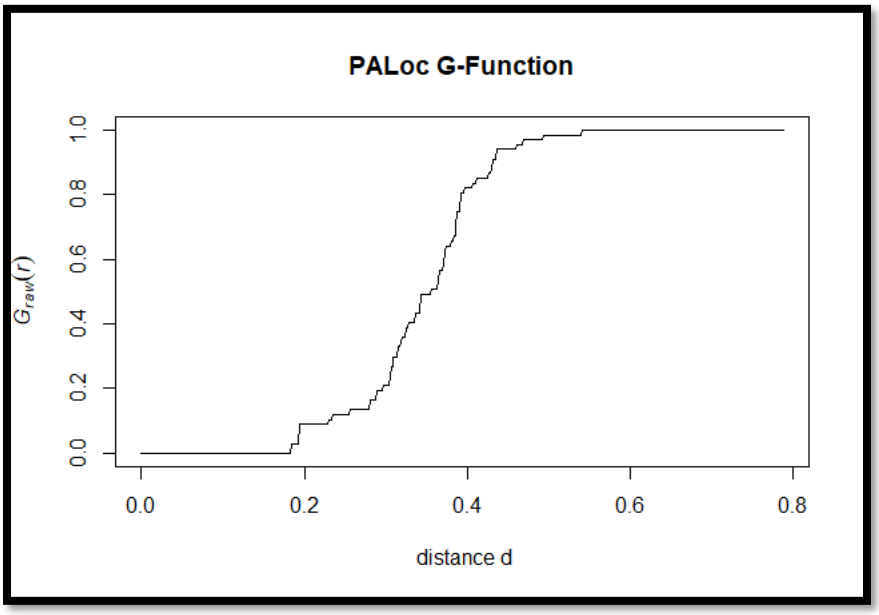
10	1	3.957777778	15.66400494	15.66400494
11	1	4.957777778	24.57956049	24.57956049
12	2	5.957777778	35.49511605	70.9902321
15	1	8.957777778	80.24178272	80.24178272
20	1	13.95777778	194.8195605	194.8195605
21	1	14.95777778	223.735116	223.735116
23	1	16.95777778	287.5662272	287.5662272
25	1	18.95777778	359.3973383	359.3973383
26	1	19.95777778	398.3128938	398.3128938
31	1	24.95777778	622.8906716	622.8906716
33	4	26.95777778	726.7217827	2906.887131
34	1	27.95777778	781.6373383	781.6373383
35	1	28.95777778	838.5528938	838.5528938
36	1	29.95777778	897.4684494	897.4684494
37	1	30.95777778	958.3840049	958.3840049
38	2	31.95777778	1021.29956	2042.599121
39	1	32.95777778	1086.215116	1086.215116
40	1	33.95777778	1153.130672	1153.130672
41	1	34.95777778	1222.046227	1222.046227
42	1	35.95777778	1292.961783	1292.961783
43	1	36.95777778	1365.877338	1365.877338
44	1	37.95777778	1440.792894	1440.792894
50	1	43.95777778	1932.286227	1932.286227
54	1	47.95777778	2299.948449	2299.948449
60	1	53.95777778	2911.441783	2911.441783
63	1	56.95777778	3244.188449	3244.188449
67	3	60.95777778	3715.850672	11147.55201
70	1	63.95777778	4090.597338	4090.597338
72	2	65.95777778	4350.428449	8700.856899
73	1	66.95777778	4483.344005	4483.344005
74	5	67.95777778	4618.25956	23091.2978
75	1	68.95777778	4755.175116	4755.175116
76	1	69.95777778	4894.090672	4894.090672
79	1	72.95777778	5322.837338	5322.837338
86	1	79.95777778	6393.246227	6393.246227
87	1	80.95777778	6554.161783	6554.161783
101	1	94.95777778	9016.97956	9016.97956
117	1	110.9577778	12311.62845	12311.62845
121	1	114.9577778	13215.29067	13215.29067
			Total	156634.1978

The VMR value of 57.73558 which is greater than 1 clearly indicates that the data is **clustered.**

Further I tried for dimensions 25*10 and VMR value is 90.82355

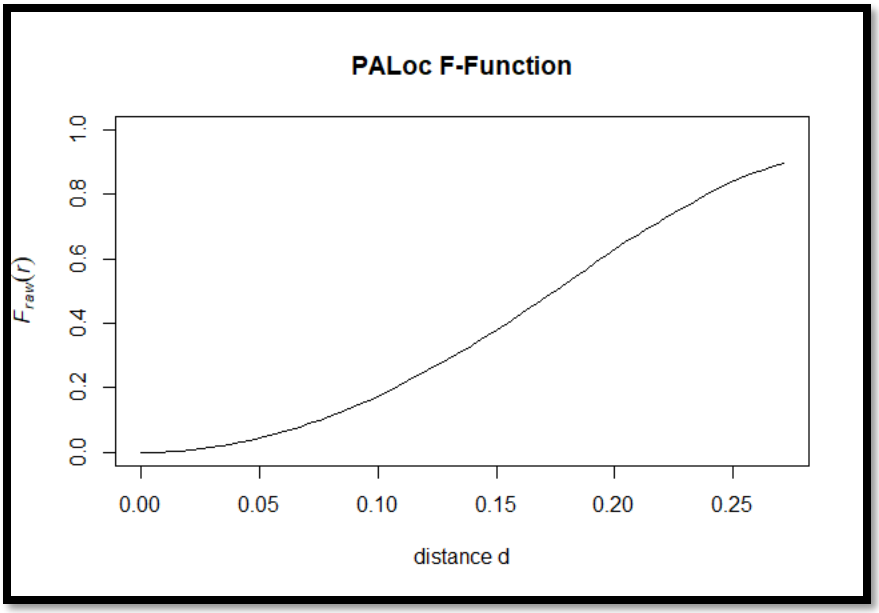
PART-B

G and F function for PA Location



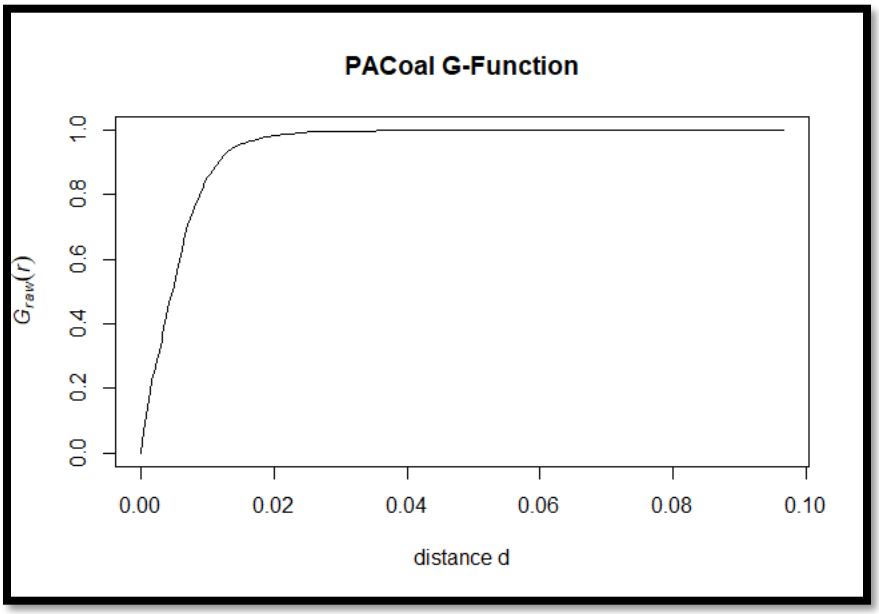
The shape of this G-function tells us that events are evenly spaced in a point pattern. Here G function remains the same at the beginning and then increases slowly up to the range of distances at which most events are spaced and then increases rapidly.

This indicates that datapoints are evenly scattered for PA Locations

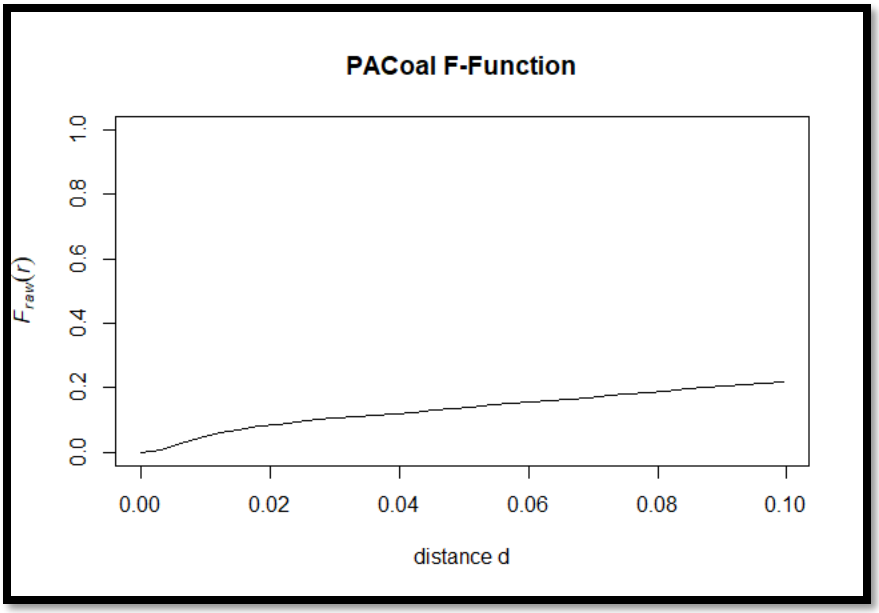


F function starts to increase at lower distances and hence we can conclude that data points are evenly scattered.

G and F function for PACoal



Here the G increases rapidly at short distances and then goes on to remain constant. This clearly indicates that the datapoints are clustered in PA Coal Dataset.



The F-function rises slowly at first for shorter distances and more rapidly at longer distances. Hence the datapoints are clustered in PACoal dataset.