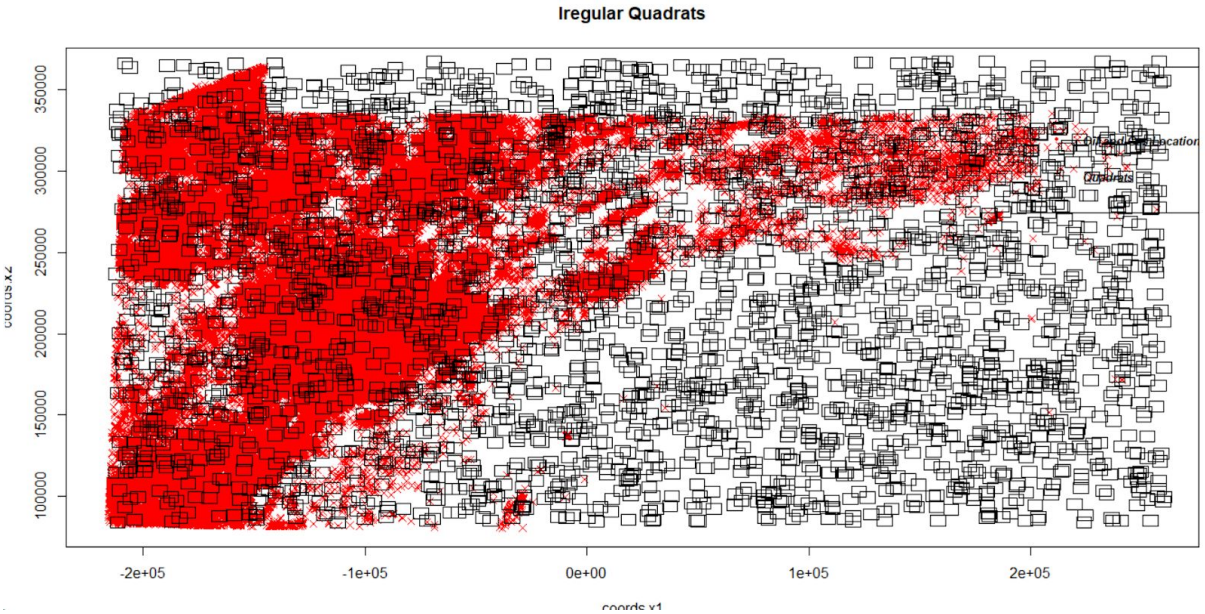
Tigmanshu
Tic48

For calculating VMR ratio through both of the QCM methods I have chosen 70 quads in one dimension and 42 quads in the other dimension.Below are steps done very briefly.

- Converting Spatial Points dataframe object to ppp object so that quadrant count method of spatstat can be used.
- Generating random points though the loop for irregular quadrats using runif function
- Drawing quadrats over map in irregular quadrats using lines function which are taking the random generated as imputs.
- Generate the tables using functions for both QCM then calculating the VMR

Below is the Map for irregular quadrats:



The legend in the right is getting overlapped by the quadrats, in black are the quadrats and in red are points.

Below are the screenshots of Table for irregular quadrats: (Only showing first 100 entries out of 353 for the sake of brevity)

	K	X	K-U	(K-μ)^2	X(K-μ)^2
1	388	1	334.8325961	1.121129e+05	1.121129e+05
2	337	1	283.8325961	8.056094e+04	8.056094e+04
3	507	1	453.8325961	2.059640e+05	2.059640e+05
4	250	1	196.8325961	3.874307e+04	3.874307e+04
5	717	1	663.8325961	4.406737e+05	4.406737e+05
6	832	1	778.8325961	6.065802e+05	6.065802e+05
7	222	1	168.8325961	2.850445e+04	2.850445e+04
8	230	1	176.8325961	3.126977e+04	3.126977e+04
9	175	1	121.8325961	1.484318e+04	1.484318e+04

10	88	1	34.8325961	1.213310e+03	1.213310e+03
11	234	1	180.8325961	3.270043e+04	3.270043e+04
12	486	1	432.8325961	1.873441e+05	1.873441e+05
13	281	1	227.8325961	5.190769e+04	5.190769e+04
14	377	1	323.8325961	1.048676e+05	1.048676e+05
15	351	1	297.8325961	8.870426e+04	8.870426e+04
16	475	1	421.8325961	1.779427e+05	1.779427e+05
17	438	1	384.8325961	1.480961e+05	1.480961e+05
18	252	1	198.8325961	3.953440e+04	3.953440e+04
19	229	1	175.8325961	3.091710e+04	3.091710e+04
20	371	1	317.8325961	1.010176e+05	1.010176e+05
21	122	1	68.8325961	4.737926e+03	4.737926e+03

22	242	1	188.8325961	3.565775e+04	3.565775e+04
23	331	1	277.8325961	7.719095e+04	7.719095e+04
24	375	1	321.8325961	1.035762e+05	1.035762e+05
25	212	1	158.8325961	2.522779e+04	2.522779e+04
26	180	1	126.8325961	1.608651e+04	1.608651e+04
27	326	2	272.8325961	7.443763e+04	1.488753e+05
28	109	1	55.8325961	3.117279e+03	3.117279e+03
29	435	1	381.8325961	1.457961e+05	1.457961e+05
30	168	1	114.8325961	1.318653e+04	1.318653e+04
31	202	1	148.8325961	2.215114e+04	2.215114e+04
32	433	1	379.8325961	1.442728e+05	1.442728e+05
33	376	1	322.8325961	1.042209e+05	1.042209e+05

34	247	1	193.8325961	3.757108e+04	3.757108e+04
35	628	1	574.8325961	3.304325e+05	3.304325e+05
36	156	1	102.8325961	1.057454e+04	1.057454e+04
37	182	1	128.8325961	1.659784e+04	1.659784e+04
38	219	4	165.8325961	2.750045e+04	1.100018e+05
39	692	1	638.8325961	4.081071e+05	4.081071e+05
40	412	1	358.8325961	1.287608e+05	1.287608e+05
41	443	1	389.8325961	1.519695e+05	1.519695e+05
42	197	2	143.8325961	2.068782e+04	4.137563e+04
43	159	1	105.8325961	1.120054e+04	1.120054e+04
44	336	1	282.8325961	7.999428e+04	7.999428e+04
45	278	1	224.8325961	5.054970e+04	5.054970e+04

46	179	1	125.8325961	1.583384e+04	1.583384e+04
47	425	1	371.8325961	1.382595e+05	1.382595e+05
48	586	1	532.8325961	2.839106e+05	2.839106e+05
49	325	1	271.8325961	7.389296e+04	7.389296e+04
50	346	1	292.8325961	8.575093e+04	8.575093e+04
51	1691	1	1637.8325961	2.682496e+06	2.682496e+06
52	221	1	167.8325961	2.816778e+04	2.816778e+04
53	418	1	364.8325961	1.331028e+05	1.331028e+05
54	293	1	239.8325961	5.751967e+04	5.751967e+04
55	133	1	79.8325961	6.373243e+03	6.373243e+03
56	193	1	139.8325961	1.955315e+04	1.955315e+04
57	103	1	49.8325961	2.483288e+03	2.483288e+03

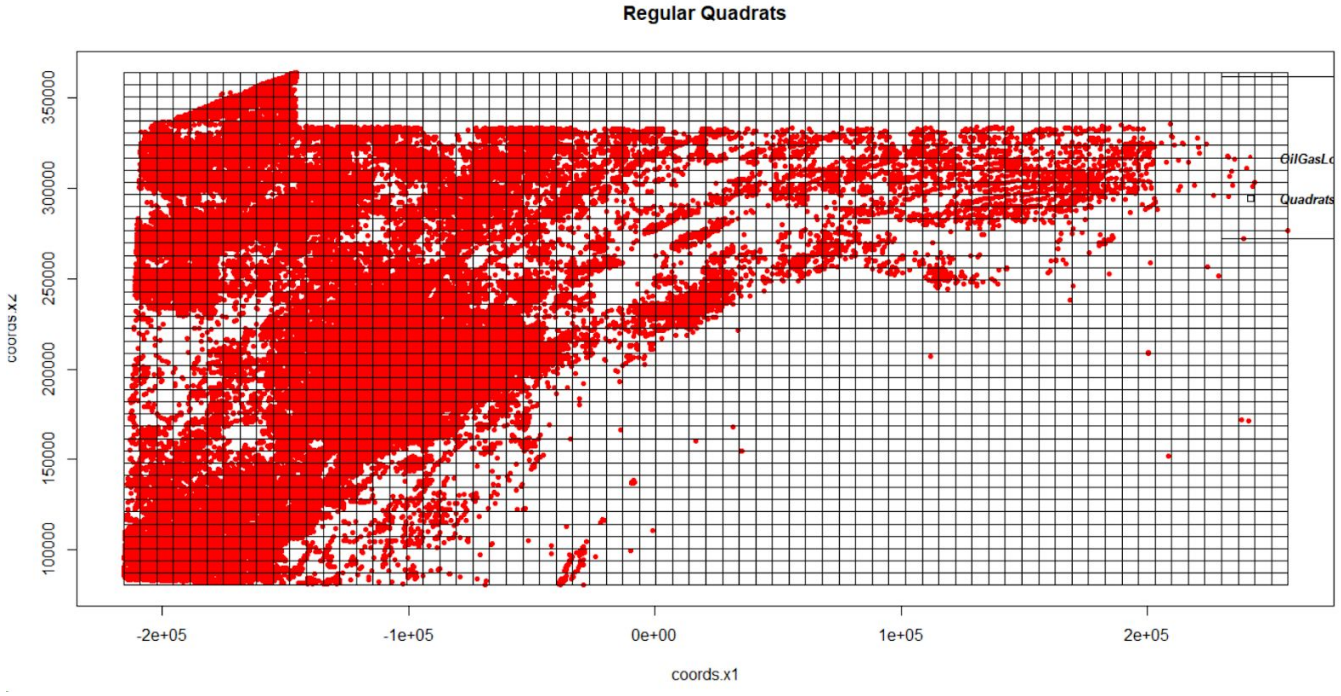
58	408	1	354.8325961	1.259062e+05	1.259062e+05
59	513	1	459.8325961	2.114460e+05	2.114460e+05
60	244	1	190.8325961	3.641708e+04	3.641708e+04
61	283	2	229.8325961	5.282302e+04	1.056460e+05
62	380	1	326.8325961	1.068195e+05	1.068195e+05
63	456	1	402.8325961	1.622741e+05	1.622741e+05
64	305	1	251.8325961	6.341966e+04	6.341966e+04
65	217	1	163.8325961	2.684112e+04	2.684112e+04
66	101	1	47.8325961	2.287957e+03	2.287957e+03
67	516	1	462.8325961	2.142140e+05	2.142140e+05
68	236	2	182.8325961	3.342776e+04	6.685552e+04
69	489	1	435.8325961	1.899501e+05	1.899501e+05

70	158	2	104.8325961	1.098987e+04	2.197975e+04
71	272	1	218.8325961	4.788771e+04	4.788771e+04
72	988	1	934.8325961	8.739120e+05	8.739120e+05
73	117	1	63.8325961	4.074600e+03	4.074600e+03
74	214	1	160.8325961	2.586712e+04	2.586712e+04
75	253	1	199.8325961	3.993307e+04	3.993307e+04
76	703	1	649.8325961	4.222824e+05	4.222824e+05
77	207	1	153.8325961	2.366447e+04	2.366447e+04
78	149	3	95.8325961	9.183886e+03	2.755166e+04
79	254	2	200.8325961	4.033373e+04	8.066746e+04
80	465	2	411.8325961	1.696061e+05	3.392122e+05
81	387	1	333.8325961	1.114442e+05	1.114442e+05

82	220	2	166.8325961	2.783312e+04	5.566623e+04
83	136	1	82.8325961	6.861239e+03	6.861239e+03
84	155	1	101.8325961	1.036988e+04	1.036988e+04
85	251	1	197.8325961	3.913774e+04	3.913774e+04
86	241	1	187.8325961	3.528108e+04	3.528108e+04
87	300	2	246.8325961	6.092633e+04	1.218527e+05
88	274	1	220.8325961	4.876704e+04	4.876704e+04
89	319	1	265.8325961	7.066697e+04	7.066697e+04
90	1009	1	955.8325961	9.136160e+05	9.136160e+05
91	120	2	66.8325961	4.466596e+03	8.933192e+03
92	910	1	856.8325961	7.341621e+05	7.341621e+05
93	276	1	222.8325961	4.965437e+04	4.965437e+04

94	734	1	680.8325961	4.635330e+05	4.635330e+05
95	646	1	592.8325961	3.514505e+05	3.514505e+05
96	339	2	285.8325961	8.170027e+04	1.634005e+05
97	350	2	296.8325961	8.810959e+04	1.762192e+05
98	458	1	404.8325961	1.638894e+05	1.638894e+05
99	138	3	84.8325961	7.196569e+03	2.158971e+04
100	249	1	195.8325961	3.835041e+04	3.835041e+04

Below is the map for Regular Quadrats:



Below are the screenshots of Table for regular quadrats:

Attaching only the first 50 entries for the sake of brevity.

K	X	K-U	(K-μ)^2	X(K-μ)^2
1	84	1	30.8325961	9.506490e+02	9.506490e+02

2	42	2	-11.1674039	1.247109e+02	2.494218e+02
3	284	1	230.8325961	5.328369e+04	5.328369e+04
4	93	3	39.8325961	1.586636e+03	4.759907e+03
5	80	1	26.8325961	7.199882e+02	7.199882e+02
6	34	3	-19.1674039	3.673894e+02	1.102168e+03
7	21	6	-32.1674039	1.034742e+03	6.208451e+03
8	811	1	757.8325961	5.743102e+05	5.743102e+05
9	1295	1	1241.8325961	1.542148e+06	1.542148e+06
10	622	1	568.8325961	3.235705e+05	3.235705e+05
11	312	1	258.8325961	6.699431e+04	6.699431e+04
12	237	1	183.8325961	3.379442e+04	3.379442e+04

13	243	1	189.8325961	3.603641e+04	3.603641e+04
14	511	1	457.8325961	2.096107e+05	2.096107e+05
15	1436	1	1382.8325961	1.912226e+06	1.912226e+06
16	442	1	388.8325961	1.511908e+05	1.511908e+05
17	39	8	-14.1674039	2.007153e+02	1.605723e+03
18	652	1	598.8325961	3.586005e+05	3.586005e+05
19	978	1	924.8325961	8.553153e+05	8.553153e+05
20	764	1	710.8325961	5.052830e+05	5.052830e+05
21	733	1	679.8325961	4.621724e+05	4.621724e+05
22	438	1	384.8325961	1.480961e+05	1.480961e+05
23	321	1	267.8325961	7.173430e+04	7.173430e+04
24	210	1	156.8325961	2.459646e+04	2.459646e+04

25	443	1	389.8325961	1.519695e+05	1.519695e+05
26	513	1	459.8325961	2.114460e+05	2.114460e+05
27	44	3	-9.1674039	8.404129e+01	2.521239e+02
28	159	1	105.8325961	1.120054e+04	1.120054e+04
29	758	1	704.8325961	4.967890e+05	4.967890e+05
30	1140	1	1086.8325961	1.181205e+06	1.181205e+06
31	104	2	50.832596 1	2.583953e+03	5.167906e+03
32	355	1	301.8325961	9.110292e+04	9.110292e+04
33	604	1	550.8325961	3.034165e+05	3.034165e+05
34	255	1	201.8325961	4.073640e+04	4.073640e+04
35	281	1	227.8325961	5.190769e+04	5.190769e+04
36	525	1	471.8325961	2.226260e+05	2.226260e+05

37	231	1	177.8325961	3.162443e+04	3.162443e+04
38	626	1	572.8325961	3.281372e+05	3.281372e+05
39	522	1	468.8325961	2.198040e+05	2.198040e+05
40	1752	1	1698.8325961	2.886032e+06	2.886032e+06
41	527	1	473.8325961	2.245173e+05	2.245173e+05
42	331	1	277.8325961	7.719095e+04	7.719095e+04
43	346	1	292.8325961	8.575093e+04	8.575093e+04
44	165	1	111.8325961	1.250653e+04	1.250653e+04
45	107	3	53.8325961	2.897948e+03	8.693845e+03
46	547	1	493.8325961	2.438706e+05	2.438706e+05
47	554	1	500.8325961	2.508333e+05	2.508333e+05
48	535	1	481.8325961	2.321627e+05	2.321627e+05

49	315	1	261.8325961	6.855631e+04	6.855631e+04
50	226	1	172.8325961	2.987111e+04	2.987111e+04

Conclusion:

I received the following values for VMR:

- Regular Quadrats:303.04
- Irregular Quadrats:280.84

For both the QCM methods I received values greater than 1 so I can say that points in the given Spatial dataframe are clustered.One of the disadvantages I feel of this method is that it is has a trail and nature error and there is no proven method to get at the ideal number of quadrants for the QCM. Secondly I feel one can arrive at different values of VMR even after starting with the same values which comes in the way if one wants to replicate their previous results.
Although having its weakness this method is a relatively easy way to arrive at the conclusion where a point pattern is clustered, random or uniform.