ACTIVITY 7 SOM -Group 2

Problem: Gilly's Restaurant chain wants to set up a central warehouse for stock keeping and distribution of raw materials, food items and cutlery in orderly manner with optimized transportation costs. There are 10 Gilly's restaurant outlets and assumed 3 major food suppliers in Bengaluru. Use Centre of Gravity method to find the best possible location to place its warehouse.

First: I web scraped google locations using free online tool "GMaps Extractor" to find X,Y coordinates of 10 Gilly's outlets.

Second: I web scraped 3 major food suppliers near Gilly's outlets namely Pellagic foods ingredients pvt. Ltd., Gopika Impex, Kubera Inc. and similar to first step found X,Y coordinates (Row 16, column E,F).

Third: Distance of outlets from supplier 1 in degrees= sqrt(((supplier1 _x coordinate-Outlet(i)_x coordinate)^2+(supplier 1_y coordinate-Outlet(i)_ycoordinate)^2)))

Similarly, distance of outlets from supplier 2 and 3 were calculated in degrees.

Fourth: Calculate coordinate to km as 1 degree= 110.574 km. Accordingly outlets to supplier 1,2,3 locations were calculated in km.

Fifth: In a new table, see column I, row 20- qty required by each outlet, no. of trucks required (truckload=25 ton, per km transport charge= Rs 28, cost per truckload=Rs 26), yearly cost on truck calculated.

Sixth: This yearly cost on truck is multiplied with distance between each supplier and outlet to get transport cost of outlets from each supplier (column L, N, P).

Seventh: Total transportation cost per year calculated by adding column L, N, P.

Eighth: Weightage of each outlet in terms of total transportation cost calculated in terms of total transportation cost calculated. Transportation cost Outlet 1/Total transportation cost.

Similarly, for other locations weightage were calculated.

Ninth: Outlet X coordinate multiplied by weightage (column S)

   Outlet Y coordinate multiplied by weightage (column T)

Tenth: Central Warehouse location= (sum of column S, sum of column T) = (12.96,77.64). Since Solver method did not help as it gave whole no. x,y coordinates (13,78) as we know every 0.01 degree change in latitude is 11 km change in map.

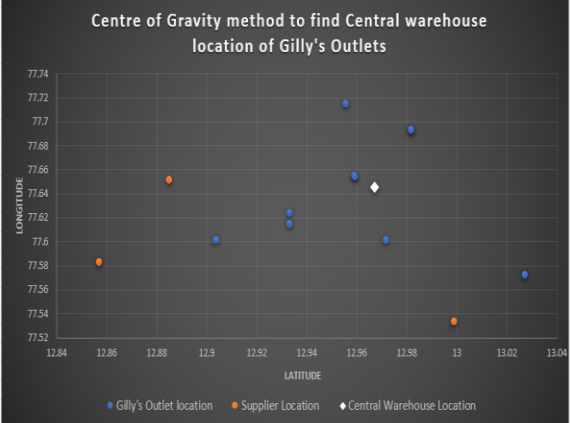Eleventh: Make a scatterplot with all coordinates of X, Y of outlets, suppliers, and central warehouse.
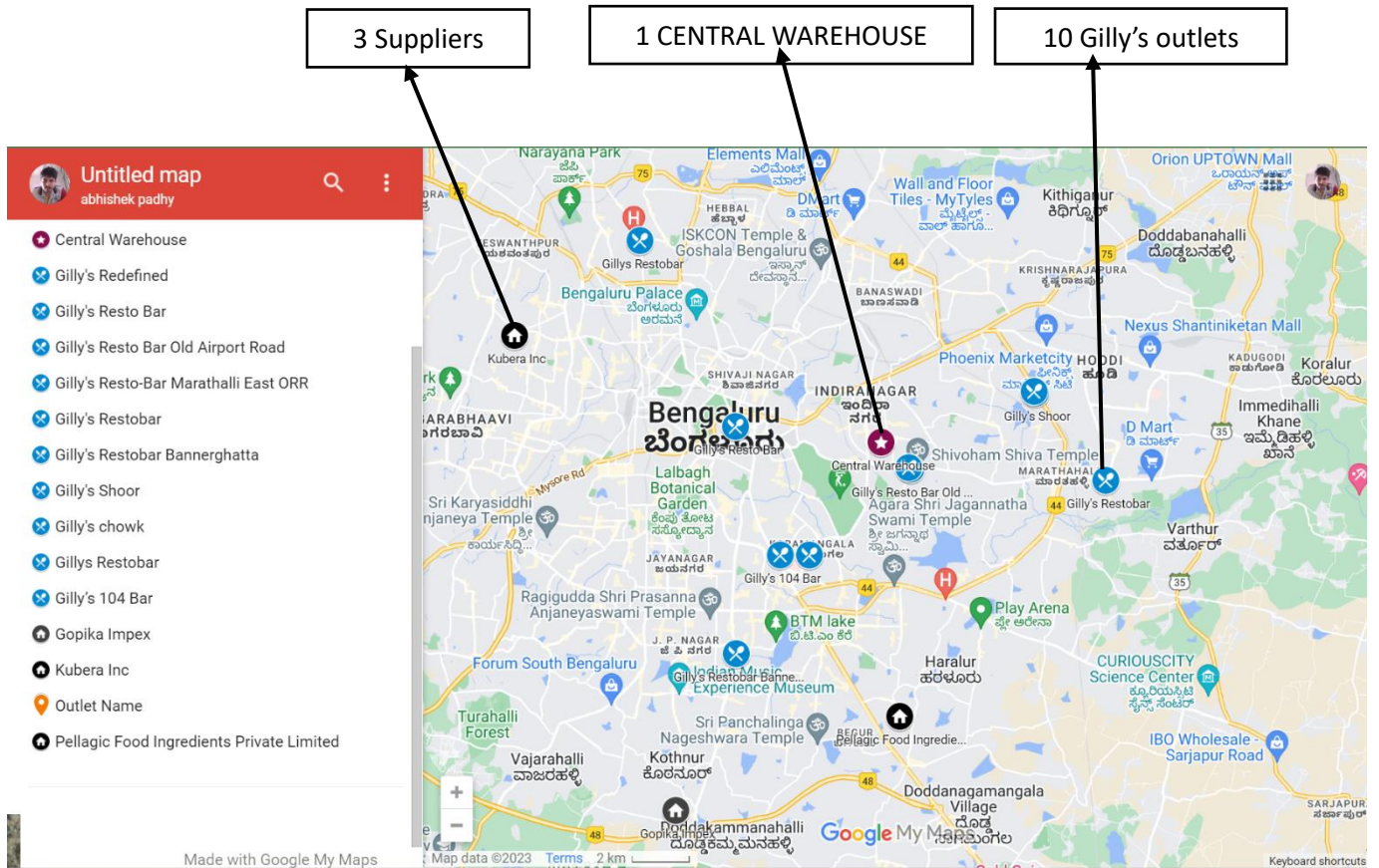
Twelfth: Make a new excel sheet with only X, Y coordinates of outlets, suppliers, and central warehouse and upload in 'Google My Maps'.

It was found that at X, Y coordinate (12.96,77.64) central warehouse can be made which will be nearer to both supplier and outlet's location making it cost effective.

Centre of Gravity method or Centroid method to find Central Warehouse location for Gilly's Outlets

N6 =K6*M6

| Centre of Gravity method to find Central warehouse location | | | | | | | | | 1 degree (in kms)= 110.574 | |

Outlet Name	Location	Categories	Outlet no.	X	Y	outlet from supplier 1 in degrees	outlet from supplier 2 in degrees	outlet from supplier 3 in degrees	outlet from supplier 1 in km	yearly trucks cost	Transport cost from supplier 1	outlet from supplier 2 in km	Transport cost from supplier 2	outlet from supplier 3 in kms	Transport cost from supplier 3	total transportation cost per year	weightage	X*weightage	Y*weightage
Gilly's Restob	Dollar Lay	Bar, Brunc	1	12.9039	77.6012	0.05341	0.0504	0.11701	5.906245194	₹468.00	₹2,764.12	5.57344	₹2,608.37	12.9379	₹6,054.95	₹11,427.44	0.059291122	0.765085582	4.601065152
Gilly's 104 Ba	65, Jyoti N	Bar, Conti	2	12.9332	77.6147	0.06036	0.08265	0.10478	6.674436755	₹650.00	₹4,338.38	9.13944	₹5,940.63	11.5859	₹7,530.84	₹17,809.86	0.092406196	1.195110103	7.172078127
Gilly's Redefir	413, 100 I	Pub, Banq	3	12.9333	77.6236	0.05549	0.08664	0.11182	6.135997223	₹494.00	₹3,031.18	9.57973	₹4,732.39	12.3646	₹6,108.11	₹13,871.68	0.071973023	0.930852045	5.586808571
Gilly's Restob	1st Floor,	Bar, Resta	4	12.9557	77.7146	0.09473	0.1648	0.18654	10.47447166	₹286.00	₹2,995.70	18.2231	₹5,211.80	20.6266	₹5,899.20	₹14,106.70	0.073192401	0.948260415	5.688117627
Gilly's Resto E	122/103,	Gastropul	5	12.9591	77.6547	0.07398	0.125	0.12796	8.179718581	₹780.00	₹6,380.18	13.8213	₹10,780.65	14.1491	₹11,036.29	₹28,197.11	0.146300348	1.895925706	11.36091406
Gilly's Resto E	2nd Floor,	Pub, Banq	6	12.9718	77.6009	0.1002	0.11624	0.07302	11.07921223	₹416.00	₹4,608.95	12.8537	₹5,347.12	8.07457	₹3,359.02	₹13,315.10	0.069085198	0.896162721	5.361075317
Gilly's Shoor	Mahadeva	Pub	7	12.9819	77.6929	0.10525	0.1666	0.16062	11.63785898	₹598.00	₹6,959.44	18.4213	₹11,015.92	17.7605	₹10,620.76	₹28,596.12	0.148370582	1.926137632	11.52733435
Gilly's Resto-E	Opposite	Pub, Banq	8	12.982	77.6927	0.10527	0.16657	0.16049	11.63994102	₹468.00	₹5,447.49	18.4183	₹8,619.78	17.746	₹8,305.13	₹22,372.40	0.116078911	1.506937708	9.018487845
Gilly's chowk	1197, 22n	Restauran	9	12.9593	77.6542	0.07415	0.12484	0.12737	8.199329268	₹494.00	₹4,050.47	13.8044	₹6,819.39	14.0842	₹6,957.59	₹17,827.45	0.092497461	1.198705514	7.182814342
Gillys Restoba	4th & 5th	Bar, Banq	10	13.0273	77.5719	0.16276	0.17057	0.04793	17.99755074	₹598.00	₹10,762.54	18.8609	₹11,278.79	5.29976	₹3,169.26	₹25,210.58	0.130804759	1.704032067	10.14676777
						0.08856	0.12543	0.12175						sum		₹192,734.43		12.96720949	77.64546317

Optimal X,Y Location coordinates for Central Warehouse (12.96,77.64)

Supplier Name	Location	Categories	Supplier no.	x	y						
Supplier Nam	Location	Categories	Supplier no.	x	y					km charge=	28
Pellagic Food	A" Block,	Frozen foo	1	12.8852	77.6513					cost per truckload	26.00
Gopika Impex	#1 2nd M	Corporate	2	12.8571	77.5826					truckload in ton	25
Kubera Inc	29, Benak	Import ex	3	12.999	77.5331					Qty Reqd	no. of trucks reqd	yearly trucks cost

	Qty Reqd	no. of trucks reqd	yearly trucks cost
1	445	18	₹468.00
2	603	25	₹650.00
3	451	19	₹494.00
4	271	11	₹286.00
5	739	30	₹780.00
6	389	16	₹416.00
7	574	23	₹598.00
8	437	18	₹468.00
9	454	19	₹494.00
10	571	23	₹598.00

Centre of Gravity method to find Central warehouse location of Gilly's Outlets

- Gilly's Outlet location
- Supplier Location
- Central Warehouse Location

3 Suppliers   **1 CENTRAL WAREHOUSE**   **10 Gilly's outlets**

Untitled map
abhishek padhy

- Central Warehouse
- Gilly's Redefined
- Gilly's Resto Bar
- Gilly's Resto Bar Old Airport Road
- Gilly's Resto-Bar Marathalli East ORR
- Gilly's Restobar
- Gilly's Restobar Bannerghatta
- Gilly's Shoor
- Gilly's chowk
- Gillys Restobar
- Gilly's 104 Bar
- Gopika Impex
- Kubera Inc
- Outlet Name
- Pellagic Food Ingredients Private Limited

Made with Google My Maps

To see the google map copy paste the link in web or ctrl+ click here:

Gilly's Restaurant chain Central Warehouse Location in Google Maps

https://www.google.com/maps/d/viewer?mid=1pusa7eDvqVNXsZ5EdAT23bqPwsUOZyg&ll=12.8667630
41463964%2C77.61094623074172&z=11