Dominant and Distinctive Functions of a Town

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Dominant functions: It means out of the total main workers of each place, that sector which has the highest number of workers

Place	Main workers	Agricultural, Hunting & Forestry, Mining & Quarrying	Manufacturing	Service
Siliguri	**148313**	3317	17842	127154
Darjeeling	**31641**	757	3146	27738
Jalpaiguri	**30292**	1090	2428	26774
Raiganj	**48707**	1787	5806	41114
Balurghat	**40193**	1265	3948	34980
Englishbazaar	**45911**	1145	4652	40114
Baharampur	**52277**	1275	6222	44780

To represent the above data, first step is to represent the main workers of the given places by proportional circle diagram

Proportional circle diagram

It means area of a circle is proportional to the quantity it represents. For example, area of a circle is proportional to the workers of a town or city

Thus,

Area of a circle is found out by the formulae $A = \pi r^2$

If the main workers of a Siliguri= 148313

Then, $\pi r^2 = 148313$

$$r^2 = 148313/\pi$$

$$r = \sqrt{\frac{148313}{\pi}}$$

r = 217.28 units

Method for constructing proportional circle diagrams

Worksheet for calculating radii (r) of circles for representing total main workers of the places

Place	Main Workers	Radius in units	Radius (according to selected scale, 50 units=1cm)
Siliguri	**148313**	217.28	4.3
Darjeeling	**31641**	100.36	2.0
Jalpaiguri	**30292**	98.19	2.0
Raiganj	**48707**	124.51	2.5
Balurghat	**40193**	113.11	2.3
Englishbazaar	**45911**	120.89	2.4
Baharampur	**52277**	129	2.6

If the selected scale is 50 units= 1cm

The scale selection depends on the size and scale of the map given

Then Radius of the circle to represent main workers of Siliguri according to the selected scale is

217.28/50=4.3 cms

Other calculated radii are converted according to the selected scale

Now, the circles would be drawn on the map or on the plain paper as required

Next, the proportional circle of each place needs to be divided into sectors to represent the number of workers involved in different activities in order to indicate the dominant functions.

Thus, **proportional circle diagrams will be converted into proportional pie diagrams**

Total angle in a circle = 360°

Total main workers of each place=360°

148313=360°

Angle in degrees to represent the workers engaged in agriculture, hunting, forestry, mining and quarrying = (360°/148313) *3317 = 8° 3'

Angle in degrees to represent the workers engaged in manufacturing = (360°/148313) *17842 = 43° 18'

Angle in degrees to represent the workers engaged in service sector = (360°/148313) *127154 = 308°38'

In this way angle in degrees to represent workers engaged in different sectors for other places are calculated

Worksheet for calculating the angle in degrees to represent the workers engaged in different sectors

Place	Main workers	Agricultural, Hunting & Forestry, Mining & Quarrying (Angle in degrees)	Manufacturing (Angle in degrees)	Service (Angle in degrees)
Siliguri	**148313**	8	44	308
Darjeeling	**31641**	8	36	316
Jalpaiguri	**30292**	13	29	318
Raiganj	**48707**	13	43	304
Balurghat	**40193**	11	35	313
Englishbazaar	**45911**	9	36	314
Baharampur	**52277**	8	43	308

Thus, dominant functions of a town are represented

Distinctive Functions- To reveal distinctiveness of functions the data is converted into percentage figures.

Place	Main workers	% Agricultural, Hunting & Forestry, Mining & Quarrying	%Manufacturing	%Service
Siliguri	**148313**	2.2	12.0	85.7
Darjeeling	**31641**	2.4	9.9	87.7
Jalpaiguri	**30292**	3.6	8.0	88.4
Raiganj	**48707**	3.7	11.9	84.4
Balurghat	**40193**	3.1	9.8	87.0
Englishbazaar	**45911**	2.5	10.1	87.4
Baharampur	**52277**	2.4	11.9	85.7

Sample calculation:

% of workers engaged in agricultural, hunting and forestry, mining and quarrying in Siliguri is as follows:

(3317/148313) *100= 2.2%

Similarly, other percentages are also calculated

Mean calculation for Category-Agricultural, Hunting & Forestry, Mining and Quarrying

Place	% Agricultural, Hunting & Forestry, Mining & Quarrying
Siliguri	2.2
Darjeeling	2.4
Jalpaiguri	3.6
Raiganj	3.7
Balurghat	3.1
Englishbazaar	2.5
Baharampur	2.4

Mean = (2.2+2.4+3.6+3.7+3.1+2.5+2.4)/7= 19.9/7=**2.84**

No. of places is 7, so dividing the total by 7

Mean calculation for Category-Manufacturing

Place	%Manufacturing
Siliguri	12.0
Darjeeling	9.9
Jalpaiguri	8.0
Raiganj	11.9
Balurghat	9.8
Englishbazaar	10.1
Baharampur	11.9

Mean= (12+9.9+8+11.9+9.8+10.1+11.9)/7= 73.6/7 = **10.5**

Mean calculation for Category-Service

Place	%Service
Siliguri	85.7
Darjeeling	87.7
Jalpaiguri	88.4
Raiganj	84.4
Balurghat	87.0
Englishbazaar	87.4
Baharampur	85.7

Mean= (85.7+87.7+88.4+84.4+87+87.4+85.7)/7= 606.3/7=**86.6**

Standard Deviation Calculation for Category-Agricultural, Hunting & Forestry, Mining and Quarrying

Place	% Agricultural, Hunting & Forestry, Mining & Quarrying	x-mean	(x-mean)^ 2
Siliguri	2.2	-0.64	0.4096
Darjeeling	2.4	-0.44	0.1936
Jalpaiguri	3.6	0.76	0.5776
Raiganj	3.7	0.86	0.7396
Balurghat	3.1	0.26	0.0676
Englishbazaar	2.5	-0.34	0.1156
Baharampur	2.4	-0.44	0.1936
Total			**2.2972**

Mean= **2.84**

Standard Deviation (S.D.)= $\sqrt{\frac{2.2972}{7}}$

= 0.57

Standard Deviation Calculation for Category-Manufacturing

Place	%Manufacturing	x-mean	(x-mean)^ 2
Siliguri	12.0	1.5	2.25
Darjeeling	9.9	-0.6	0.36
Jalpaiguri	8.0	-2.5	6.25
Raiganj	11.9	1.4	1.96
Balurghat	9.8	-0.7	0.49
Englishbazaar	10.1	-0.4	0.16
Baharampur	11.9	1.4	1.96
Total			**13.43**

Mean= **10.5**

Standard Deviation (S.D.) = $\sqrt{\frac{13.43}{7}}$

= **1.39**

Standard Deviation Calculation for Category-Service

Place	%Service	x-mean	(x-mean)^ 2
Siliguri	85.7	-0.9	0.81
Darjeeling	87.7	1.1	1.21
Jalpaiguri	88.4	1.8	3.24
Raiganj	84.4	-2.2	4.84
Balurghat	87.0	0.4	0.16
Englishbazaar	87.4	0.8	0.64
Baharampur	85.7	-0.9	0.81
Total			**11.71**

Mean= **86.6**

Standard Deviation= $\sqrt{\frac{11.71}{7}}$

= **1.29**

Table for Mean and Standard Deviation

Occupational Categories	Agriculture	Manufacturing	Service
Mean	2.84	10.5	86.6
Standard Deviation	0.57	1.39	1.29

Calculation of Z scores

Z scores= (x-mean)/S.D.

Category-Agricultural, Hunting & Forestry, Mining and Quarrying

Place	% Agricultural, Hunting & Forestry, Mining & Quarrying	(x-mean)/S.D.
Siliguri	2.2	-1.122807018
Darjeeling	2.4	-0.771929825
Jalpaiguri	3.6	1.333333333
Raiganj	3.7	1.50877193
Balurghat	3.1	0.456140351
Englishbazaar	2.5	-0.596491228
Baharampur	2.4	-0.771929825

Category-Manufacturing

Place	%Manufacturing	(x-mean)/S.D.
Siliguri	12.0	1.079136691
Darjeeling	9.9	-0.431654676
Jalpaiguri	8.0	-1.798561151
Raiganj	11.9	1.007194245
Balurghat	9.8	-0.503597122
Englishbazaar	10.1	-0.287769784
Baharampur	11.9	1.007194245

Category- Service

Place	%Service	(x-mean)/S.D.
Siliguri	85.7	-0.697674419
Darjeeling	87.7	0.852713178
Jalpaiguri	88.4	1.395348837
Raiganj	84.4	-1.705426357
Balurghat	87.0	0.310077519
Englishbazaar	87.4	0.620155039
Baharampur	85.7	-0.697674419

Tabulation of Z-scores

Place	Z scores		
	Agriculture	Manufacturing	Service
Siliguri	-1.122807018	1.079136691	-0.697674419
Darjeeling	-0.771929825	-0.431654676	0.852713178
Jalpaiguri	1.333333333	-1.798561151	1.395348837
Raiganj	1.50877193	1.007194245	-1.705426357
Balurghat	0.456140351	-0.503597122	0.310077519
Englishbazaar	-0.596491228	-0.287769784	0.620155039
Baharampur	-0.771929825	1.007194245	-0.697674419