

資料的整理與表現

統計表與統計圖

要如何呈現這些資料成為有意義的資訊？

MORRIS SHEFFARD TEHARKANA	TEHARKANA	TX	75061	4	6,793,818	1,747,590	-3,508	988,549	45,767	1192	1790	2	1
THE NEW COLLARS FIREMEN	METAIDE	LA	70004	4	127,295,031	45,761,450	346,409	10,714,227	595,507	16205	30000	64	0
FRANKLIN TRUST	HARTFORD	CT	06114	1	40,517,179	4,800,633	-31,827	4,608,005	402,314	6454	9691	20	4
E	BATON ROUGE	LA	70816	4	216,921,143	46,350,635	356,635	28,811,771	1,725,880	22440	705973	92	11
WOODMEN	OMAHA	NE	68102	4	6,241,117	2,628,150	27,941	1,224,490	18,036	1183	2200	3	1
NEW HAVEN TEACHERS	NEW HAVEN	CT	06510	1	8,101,242	6,590,010	105,385	2,678,409	0	1673	2100	0	1
WATERBURY CONNECTICUT TEACHER	WATERBURY	CT	06722	1	160,703,553	37,910,315	335,713	21,447,877	253,071	14267	25000	22	2
FARMERS	JACKSONVILLE	FL	32218	3	12,085,011	4,801,040	34,908	1,894,607	51,810	1468	3500	5	1
CENTRE	OMAHA	NE	68114	4	376,196,660	15,694,432	4,401,130	36,710,301	8,947,194	60086	769723	170	12
BRIDGEPORF FALDFIELD TEACHERS	BRIDGEPORF	CT	06604	1	362,1190	2,102,000	25,100	1,434,403	96,891	1205	4500	2	1
ST BONIFACE FARMER	WEST HAVEN	CT	06516	1	476,479	154,835	4,358	95,482	29,500	143	143	0	1
FIRST DAKOTA	SIOUX FALLS	SD	57101	4	4,106,453	738,000	-4,801	519,391	750	550	700	3	1
WATERBURY FIREHOERS	WATERBURY	CT	06708	1	51,177,576	9,097,170	218,678	5,278,351	324,398	7977	27000	13	3
FAROO PUBLIC SCHOOLS	FAROO	ND	58028	4	19,987,391	2,652,542	113,451	3,686,233	51,450	2395	3000	7	2
MISSISSIPPI POSTAL EMPLOYEES	JACKSON	MS	39205	3	54,025,382	3,675,187	221,514	11,020,230	30,507	4475	35000	12	1
STATE EMPLOYEES	ALBANY	NY	12245	1	1,651,828,350	468,292,182	4,698,746	233,590,325	6,165,394	167379	1163153	539	21
E 53	LONDON	NY	07036	2	70,205,426	25,441,620	-294,466	8,601,158	383,033	5777	7518	20	4
SIOUX FALLS	SIOUX FALLS	SD	57104	4	121,528,980	30,554,610	1,087,625	13,316,242	278,769	21084	150000	51	4
FIRST CLASS	ALLEN TOWN	PA	18109	2	2,191,859	150,755	242,063	3,716,404	543,229	3324	10000	6	2
NORTHERN STE FWR CO FAROO DIV	FAROO	ND	58108	4	768,732	3214	241	71,882	3,488	107	111	0	1
LOWO ISLAND CITY POSTAL EMPLOYEES	LOWO BELND CITY	NY	31161	1	3,759,083	3,158,120	6,794	972,906	10,083	377	1000	0	1
SERVICE FIRST	SIOUX FALLS	SD	57103	4	118,571,577	40,065,444	425,924	11,450,503	3,806,839	16308	208479	61	5
BAY FORD	BROOKLYN	NY	11209	1	98,290,169	5,987,677	47,652	10,844,511	917,857	6105	7900	20	2
CAMPUS	BATON ROUGE	LA	70398	4	374,175,262	118,540,114	1,967,061	43,686,768	833,507	39264	115000	162	0
AMERICAN RAOLE	EAST HARTFORD	CT	06118	1	1,098,825,501	215,908,753	4,095,150	110,116,414	4,452,979	96504	1203169	238	17
ASPIREIT	COLUMBIA	SC	29201	3	10,120,725	1,489,354	37,506	1,385,411	2,121	1763	3000	4	1
FIRST ATLANTIC	EATONTOWN	NY	07724	2	246,300,329	59,127,281	150,110	11,459,610	1,227,618	39514	150000	84	0
ATLANTA TEACHERS	ATLANTA	GA	30314	3	7,079,223	4,713,819	-80,620	1,052,255	190	1669	5000	3	1
POST OFFICET	PITTSBORO	PA	15222	2	11,320,409	3,043,422	1,351	4,574,595	117,258	1712	3000	2	1
CATARACT CITY	NIAGARA FALLS	NY	14304	1	4,311,562	1,338,697	-25,947	920,667	81,402	793	1200	2	1
NIAGARA FALLS TEACHERS	NIAGARA FALLS	NY	14304	1	7,805,570	4,288,647	38,423	1,841,476	18,720	1536	2500	3	1
KEMBA ROANOKE	SALEM	VA	24153	2	54,741,692	16,081,649	179,585	9,653,420	482,314	10786	25000	13	2
KEMBA CHARLESTON	DUNBAR	WV	25664	2	29,855,462	12,044,651	178,681	7,251,894	210,218	4367	25000	11	1
ITALO-AMERICAN	ORLANDALE	FL	31185	1	6,651,178	0	46,121	761,352	23,278	360	1200	0	1
ESSEX COUNTY BI EMPLOYEES	WYOMING	NY	08765	2	6,801,265	1,673,000	17,223	1,030,006	25,275	2252	6000	4	1
FEAC	WASHINGTON	DC	20034	2	66,085,228	10,685,120	-15,300	8,244,218	319,847	8328	17400	24	2
TRIBORO POSTAL	PITTSBORO	NY	11152	1	61,134,837	44,667,804	951,024	16,980,774	389,247	4205	12000	9	1
COUNTY EDUCATORS	BOEBLE PARK	NY	07204	2	74,114,242	39,408,674	738,009	10,290,008	119,918	15280	20000	25	3
MOUNT VERNON NY POSTAL EMPLOYEES	MT. VERNON	NY	10550	1	2,137,282	208,416	-4,449	383,354	41,812	344	650	0	1
OMAHA	OMAHA	NE	68124	4	52,876,748	17,707,842	109,423	4,551,667	611,171	7677	75000	20	6
YPOO COUNTY	TERRE HAUTE	IN	47867	3	28,206,096	10,066,388	28,851	2,250,463	220,954	8322	105948	14	1
TEL-D-WAY	MEDOT	ND	58022	4	3,173,299	386,585	15,241	341,528	0	446	518	0	1
NORTHERN STE FWR COMPANT EMP	GRAND FORKEE	ND	58201	4	835,504	311,025	6,508	117,153	0	119	173	0	1
TACOMIS	WASHINGTON	DC	20436	2	2,134,005	16,374	630	291,797	18,605	313	300	4	1
FEDCHOICE	LANHAM	MD	20706	2	242,760,011	59,956,415	932,682	28,230,429	373,196	21966	100000	86	5
JUSTICE	CHARTILLY	VA	20151	2	433,412,047	30,897,137	1,147,567	40,178,047	5,951,717	46802	200000	139	19
BONNER SPRINGS	BONNER SPRINGS	KS	66012	4	1,085,977	493,630	-13,578	229,838	16,265	701	1500	2	1
FOOD MARKETNG	FORT WAYNE	IN	46008	3	2,821,803	836,300	26,622	346,618	51,574	1031	3393	2	1
L.C. SCHOOL EMPLOYEES	OARY	IN	46408	3	21,085,334	17,223,453	85,009	4,514,702	100,503	1562	10000	6	2
THREE RIVERS	FORT WAYNE	IN	46001	3	508,796,790	79,101,576	2,810,229	61,490,489	1,301,280	70798	550000	182	19
TREASURY DEPARTMENT	WASHINGTON	DC	20220	2	146,573,230	9,115,657	-546,780	11,850,884	1,563,491	25260	150000	47	9
NEW YORK STATE EMPLOYEES	NEW YORK	NY	10005	1	2,364,589	24,900	8,321	443,791	115,879	1348	2500	1	1
DAKOTLAND	BURON	SD	57350	4	126,908,748	21,799,470	1,966,564	11,303,014	220,974	18738	40000	40	5
NORTHERN INDIANA	MERRILLVILLE	IN	46410	3	26,651,967	61,561,116	-113,569	21,740,733	492,459	6254	12004	14	2
OARY FIREFOIGHTERS ASSOCIATION	OARY	IN	46402	3	2,164,812	372,300	67,446	602,465	39,790	451	1200	2	1
LOUISIANA	LAFACE	LA	70069	4	113,923,777	15,179,849	774,431	10,882,155	830,456	19849	286156	59	3
SOUTH FLORIDA EDUCATIONAL	MIAMI	FL	33183	3	634,520,703	332,008,389	1,018,268	166,452,804	642,717	56328	500000	164	4
PEOPLES TRUST	HOUSTON	TX	77210	4	347,006,537	62,711,577	203,818	34,001,678	2,668,839	33527	1000000	100	7
PEOPLES NATURAL G OEN OEN EMP	PITTSBORO	PA	15212	2	4,074,263	87,998	24,815	528,116	15,021	410	500	0	1
ROANOKE VIRGINIA FIREMEN	ROANOKE	VA	24014	2	2,635,040	29,654	28,868	739,812	22,853	846	1269	0	1
FLORIDA A & M UNIVERSITY	TALLAHASSEE	FL	32301	3	10,146,474	2,217,121	43,921	2,477,513	463,568	860	5000	11	1
BAY FISH	BAY FISH	TX	75741	3	404,786,315	19,528,895	103,882	4,566,788	384,590	7342	12000	17	4
NORTHWEST ARENAS2	PATYETVILLE	AR	72703	4	10,882,323	1,500,620	22,187	1,170,230	113,435	4973	50000	5	1
OTE	TAMPA	FL	33672	3	2,159,459,433	81,174,762	*****	155,617,590	33,601,884	20288	408616	600	38
WHITING REFINERY	WHITING	IN	46394	3	41,672,215	29,000,633	384,579	10,073,510	25,425	3232	6300	4	1
MEMBERS CHOICE OF CENTRAL TEXAS	WACO	TX	76707	4	104,508,284	23,804,441	290,333	9,055,542	680,921	22594	423181	71	4
A T & EMPLOYEES PITTSBORO	PITTSBORO	PA	15219	2	8,962,096	4,643,098	31,740	2,364,638	20,122	1222	2500	3	1
ALLEGIANT COMMUNITI	PITTSBORO	PA	15222	2	110,465,474	26,731,794	457,506	16,108,390	274,300	13749	120166	31	2
PERFINANCIAL	ROCKY HILLE	MD	20857	2	52,041,689	20,046,265	42,914	5,538,107	213,726	1717	386500	26	7
HOPE	CLARKSBORO	WV	26301	2	25,565,221	9,775,143	228,499	4,300,133	134,970	2729	6000	3	1
MAONOLIA	JACKSON	MS	39206	3	79,958,061	22,143,616	763,740	14,728,136	508,832	12549	497000	35	3
PENTAGON	ALEXANDRIA	VA	22314	2	*****	147,526,606	95,411,443	*****	42,323,592	846549	1150000	1030	31
KARPE PREMIER	ALEXANDRIA	VA	22312	2	125,259,812	26,266,476	-57,572	15,991,406	2,416,191	9797	100000	36	1
PITTSBORO FIREFOIGHTERS	PITTSBORO	PA	15220	2	63,776,920	28,431,099	151,877	7,924,382	470,114	5541	7500	9	1
GREATER PITTSBORO POLICE	PITTSBORO	PA	15220	2	42,566,154	12,037,690	830,311	6,380,882	572,004	5317	10000	7	1

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一萬筆資料

要如何呈現這些資料成為有意義的資訊？

MORRIS SHEFFARD TEHARKANA	TEHARKANA	TX	75501	6,793,818	1,747,590	-3,508	988,549	45,705	1,896	2,108	2	1
FRST CATTLE	COVINGTON	LA	70433	31,421,894	8,844,646	-516,423	4,784,412	56,090	2973	22700	13	2
THE NEW GULLANS FIREMEN'S	METABIE	LA	70004	127,295,190	45,762,438	348,490	18,742,227	866,200	16203	30000	64	8
FRANKLIN TRUST	HARTFORD	CT	06114	40,517,139	4,808,639	-35,827	4,608,025	432,311	6454	9691	20	4
E	BATON ROUGE	LA	70816	216,921,143	46,350,635	356,635	28,811,771	1,725,880	22440	705973	92	11
WOODMEN	OMAHA	NE	68102	6,241,117	2,628,150	27,941	1,224,490	18,838	1183	2200	3	1
NEW HAVEN TEACHERS	NEW HAVEN	CT	06510	8,101,242	6,590,030	105,385	2,678,409	0	1673	2100	0	1
WATERBURY CONNECTICUT TEACHER	WATERBURY	CT	06722	160,703,553	37,910,313	0	0	0	0	0	0	0
FARMERS	JACKSONVILLE	FL	32218	12,985,011	4,801,640	34,908	1,894,607	51,910	1468	3500	5	1
CENTRE	OMAHA	NE	68114	376,198,660	15,694,432	440,130	36,710,381	8,947,546	60386	769723	170	12
BRIDGEPORF FALDFIELD TEACHERS	BRIDGEPORF	CT	06604	362,1190	2,102,000	23,100	1,434,403	96,891	1205	4500	2	1
ST BONIFACE FARMER	WEST HAVEN	CT	06516	476,479	154,835	4,358	95,482	29,500	143	143	0	1
FRST DAKOTA	SIOUX FALLS	SD	57101	4,106,453	738,000	-4,801	519,391	790	550	700	3	1
WATERBURY FIREFIGHTERS	WATERBURY	CT	06708	51,177,576	9,097,170	218,678	5,278,351	324,308	7977	27000	13	3
FAROO PUBLIC SCHOOLS	FAROO	ND	58102	18,987,391	2,652,542	113,451	3,686,323	51,450	2395	3000	7	2
MISSISSIPPI POSTAL EMPLOYEES	JACKSON	MS	39205	54,320,382	3,675,197	221,514	11,233,230	50,787	4475	35000	12	1
STATE EMPLOYEES	ALBANY	NY	12205	1,651,818,330	468,802,185	6,898,736	23,958,335	6,165,786	167379	1163313	330	21
E 53	LONDON	NE	67036	70,265,436	25,441,620	-294,466	3,601,158	380,031	5777	7518	20	4
SIOUX FALLS	SIOUX FALLS	SD	57104	121,528,980	30,554,610	1,087,625	13,316,442	278,778	21084	150000	31	4
FRST CLASS	ALLEN TOWN	PA	18109	2,191,859	150,755	242,063	3,716,404	543,220	3324	10000	6	2
NORTHERN STEEL PWR CO FAROO DIV	FAROO	ND	58108	768,732	3214	241	71,882	3,408	107	111	0	1
LOWO ISLAND CITY POSTAL EMPLOYEES	LOWO BELND CITY	NV	11161	3,759,083	3,158,120	6,794	672,906	10,080	377	1000	0	1
SERVICE FRST	SIOUX FALLS	SD	57103	118,371,577	40,805,444	425,624	11,450,503	3,886,878	16388	208479	61	5
BAY FORD	BRACKLEY	NY	11209	98,290,169	3,987,627	472,652	43,844,511	917,857	6109	7900	20	2
CAMPUS	BATON ROUGE	LA	70898	374,175,262	118,548,114	3,907,604	41,686,768	833,521	39264	115000	162	6
AMERICAN RAOLE	EAST HARTFORD	CT	06118	1,098,825,501	215,908,753	4,095,150	110,116,414	4,452,976	96504	1203169	238	17
ASPERK	COLUMBIA	SC	29201	10,120,725	1,489,354	37,506	1,385,411	2,122	1763	3000	4	1
FRST ATLANTIC	EATONTOWN	NJ	07724	246,309,329	59,127,281	150,110	11,459,610	1,227,618	39314	150000	84	8
ATLANTA TEACHERS	ATLANTA	GA	30314	7,079,223	4,713,619	-60,620	1,052,255	194	1669	5000	3	1
POST OLAZETTE	PITTSBURGH	PA	15222	11,320,439	3,044,422	1,151	4,574,598	117,584	1712	3000	2	1
SHELL COMMUNITY	WOOD RIVER	IL	62095	83,201,744	15,948,579	172,252	11,120,051	177,194	14004	25000	43	2
CATARACT CITY	NIAGARA FALLS	NY	14304	431,562	1,338,687	-25,947	930,667	81,402	793	1200	2	1
NIAGARA FALLS TEACHERS	NIAGARA FALLS	NY	14304	7,805,570	4,288,647	38,423	1,841,476	18,728	1536	2500	3	1
KEMBA ROANOKE	SALEM	VA	24153	54,741,692	16,081,648	179,585	9,653,420	482,314	10786	25000	13	2
KEMBA CHARLESTON	DUNBAR	WV	25664	28,855,462	12,044,651	178,681	7,251,984	210,218	4367	29000	11	1
ITALO-AMERICAN	ENDLEBAY	NY	11385	6,651,178	0	46,121	761,352	23,276	360	1200	0	1
ERSEX COUNTY BI EMPLOYEES	WHEELERS	WV	26102	6,801,695	1,671,000	0	1,030,000	25,275	2252	3000	4	1
PERC	WASHINGTON	DC	20036	66,885,228	10,685,108	-15,300	8,244,218	339,844	8328	17400	24	2
TRIBORO POSTAL	PLUSHORO	NY	11332	61,134,837	44,667,804	951,024	16,980,774	389,247	4205	12000	9	1
COUNTY EDUCATORS	BOZELLE PARK	NY	11704	74,114,242	39,408,674	738,009	10,290,008	119,918	15280	20000	25	3
MOUNT VERNON NY POSTAL EMPLOYEES	MT VERNON	NY	10550	2,137,282	208,416	-4,449	383,354	41,812	344	650	0	1
OMAHA	OMAHA	NE	68124	52,876,748	17,707,642	109,423	4,551,667	611,171	7677	75000	20	6
YPO COUNTY	TERRE HAUTE	IN	47807	28,206,096	10,606,388	288,851	2,250,463	220,954	8322	105948	14	1
TEL-D-WAY	MENOT	ND	58702	3,173,299	388,589	15,241	341,580	446	146	500	0	1
NORTHERN STEEL PWR COMPANY EMP	GRAND FORKES	ND	58201	835,504	311,025	6,508	117,253	0	119	173	0	1
TACOMIS	WASHINGTON	DC	20436	2,134,005	16,374	630	291,797	18,600	313	900	4	1
PEDCHOICE	LANHAM	MD	20706	242,760,011	59,956,415	932,682	28,230,429	373,196	21966	100000	86	5
JUSTICE	CHARLITLY	VA	20151	433,412,047	30,897,137	1,47,567	40,178,047	5,951,711	46802	200000	139	19
BONNER SPRINGS	BONNER SPRINGS	KS	66612	1,085,977	493,630	-15,576	228,838	16,280	701	1500	2	1
MERIDION POSTAL EMPLOYEES	WALLINGFORD	CT	06492	997,556	606,205	6,572	1,903,689	0	146	200	0	1
FOOD MARKETING	FORT WAYNE	IN	46808	2,021,803	838,300	-26,222	346,818	51,574	1031	3093	2	1
L.C. SCHOOL EMPLOYEES	OARY	IN	46408	2,105,334	17,223,455	85,809	4,514,702	100,530	1562	10000	6	2
THREE RIVERS	FORT WAYNE	IN	46801	508,796,790	79,101,576	6810,229	61,490,489	1,301,200	70798	550000	182	19
TREASURY DEPARTMENT	WASHINGTON	DC	20220	146,573,230	9,115,657	-546,780	11,850,884	1,563,449	25260	150000	47	9
NEW YORK STATE EMPLOYEES	NEW YORK	NY	10005	2,364,589	24,900	8,321	443,791	115,878	1348	2500	1	1
DAKOTIAN	BURON	SD	57330	126,908,749	21,799,470	396,564	11,380,140	220,876	18738	40000	40	5
NORTHERN INDIANA	MERRILLVILLE	IN	46410	26,651,967	6,136,118	-113,569	2,174,033	492,498	6254	13024	14	2
OARY FIREFIGHTERS ASSOCIATION	OARY	IN	46402	2,164,921	372,300	67,446	602,685	37,298	451	1200	2	1
LOUISIANA	LAFACE	LA	70069	11,923,777	15,179,949	774,431	10,882,155	830,450	19849	286356	59	3
SOUTH FLORIDA EDUCATIONAL	MIAMI	FL	33183	634,520,703	332,008,388	1,018,268	166,452,004	642,711	56328	500000	164	4
PEOPLES TRUST	HOUSTON	TX	77210	347,006,537	62,711,577	303,818	34,001,678	2,668,638	33527	100000	100	7
PEOPLES NATURAL G ORG OEN EMP	PITTSBURGH	PA	15212	4,074,263	87,998	24,815	528,116	15,022	410	500	0	1
ROANOKE VIRGINIA FIREMEN	ROANOKE	VA	24014	2,635,040	29,654	28,868	739,812	22,885	846	1269	0	1
FLORIDA A & M UNIVERSITY	TALLAHASSEE	FL	32301	20,242,445	2,217,121	-43,321	2,477,513	463,596	3623	12000	11	1
BAY FORD	BAY FORD	NY	11744	404,786,135	18,659,899	67,846	602,685	37,298	451	1200	2	1
NORTHWEST ARKANSAS	PAVETTETVILLE	AR	72703	10,882,323	1,580,626	22,187	1,170,230	133,435	4973	90000	5	1
OTE	TAMPA	FL	33672	2,158,459,433	81,174,762	*****	155,617,590	33,001,888	262888	408816	600	38
WHITING REFINERY	WHITING	IN	46394	41,637,215	29,000,933	304,579	10,073,510	25,425	3332	6300	4	1
MEMBERS CHOICE OF CENTRAL TEXAS	WACO	TX	76707	104,508,284	23,804,441	290,333	9,055,542	680,922	25294	423181	71	4
A T & EMPLOYEES PITTSBURGH	PITTSBURGH	PA	15219	8,962,096	4,644,098	31,740	2,364,638	20,122	1222	2500	3	1
ALLEGENT COMMUNITY	PITTSBURGH	PA	15222	110,465,474	26,731,708	49,576	16,108,590	274,300	13749	120166	14	2
FINANCIAL	ROCKVILLE	MD	20857	52,041,689	20,486,305	42,914	5,538,107	233,750	1737	386000	26	3
HOPE	CLARKSBORO	MS	39201	25,265,221	9,775,143	228,499	4,300,333	134,970	2729	6000	3	1
MAONOLIA	JACKSON	MS	39206	79,958,061	22,143,616	763,740	14,728,136	508,832	12549	49700	35	3
PENTAGON	ALEXANDRIA	VA	22314	*****	147,526,608	4,114,433	*****	42,323,592	846549	1150000	1030	31
KARPE PREMIER	ALEXANDRIA	VA	22312	125,259,812	26,266,476	-57,572	15,991,406	2,416,139	9797	100000	36	1
PITTSBURGH FIREFIGHTERS	PITTSBURGH	PA	15220	63,776,920	28,431,899	151,877	7,924,082	470,114	5541	7500	9	1
GREATER PITTSBURGH POLICE	PITTSBURGH	PA	15220	42,566,134	12,037,892	532,211	6,368,082	572,000	5317	10000	7	1

?

V.S.

?

.....

一萬筆資料

我們希望了解「資料」的什麼？

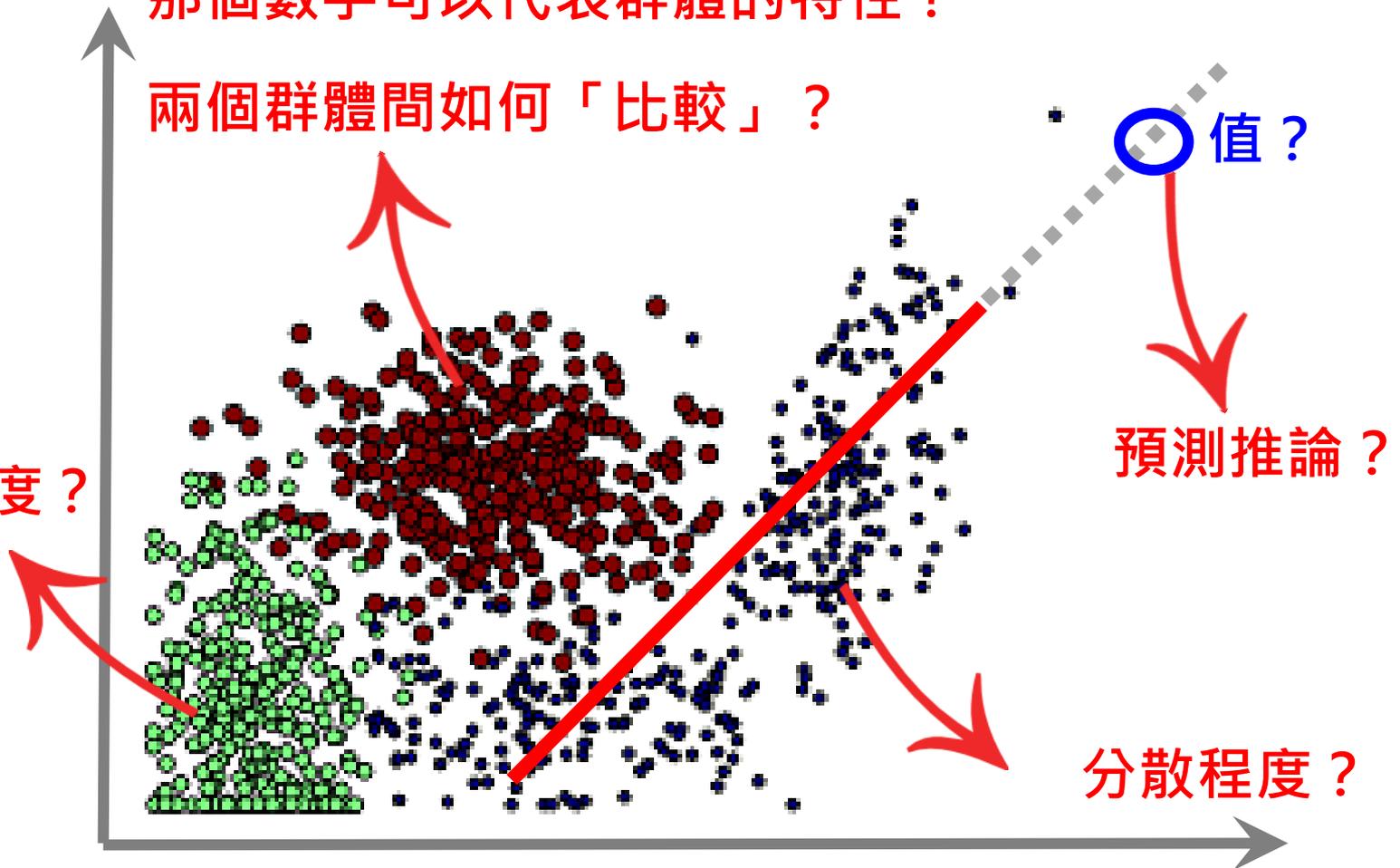
那個數字可以代表群體的特性？

兩個群體間如何「比較」？

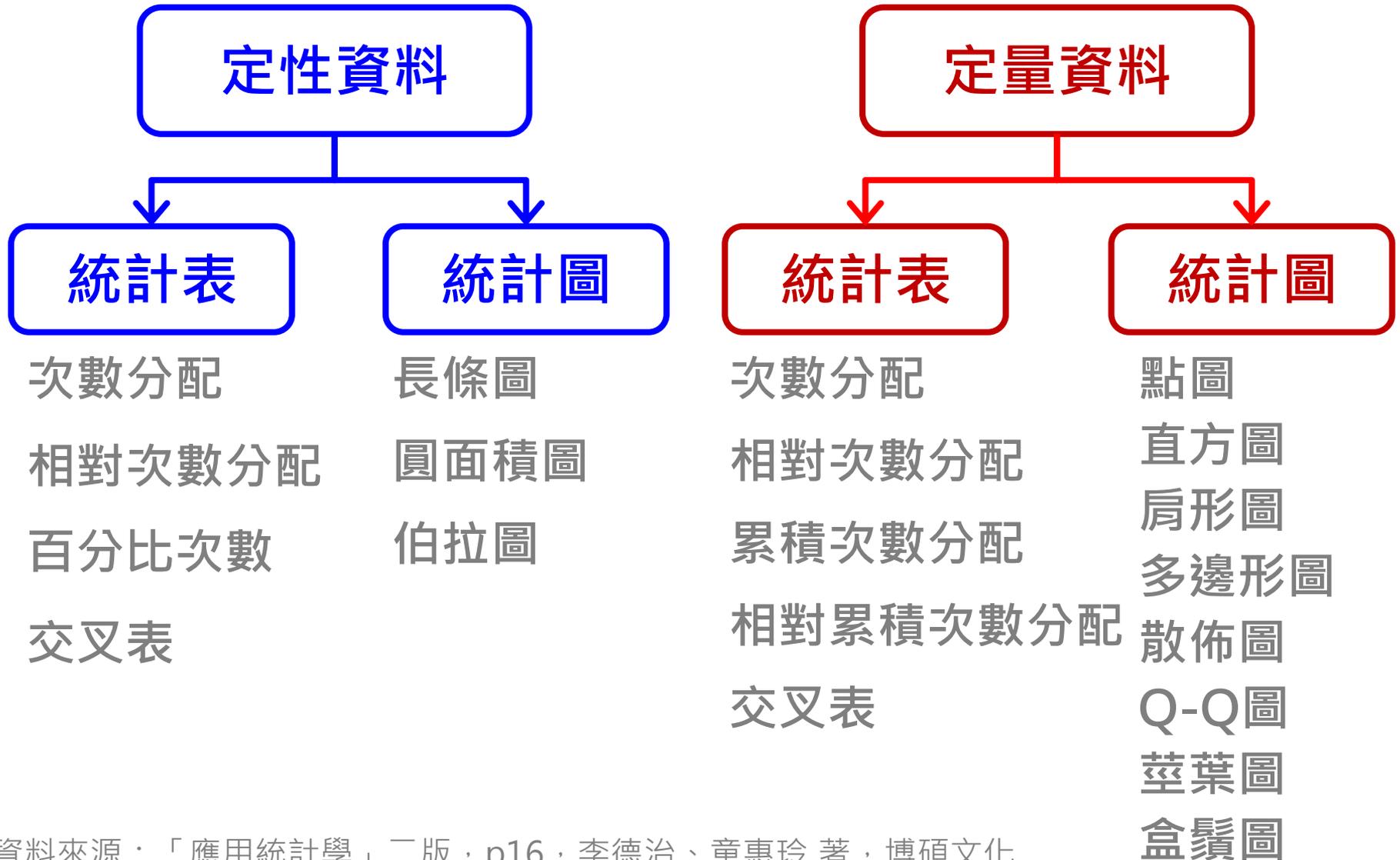
集中程度？

預測推論？

分散程度？



常見的統計圖表





統計表

用表格 (table) 整理原始資料

統計表案例

次數分配

組限	次數	相對次數	百分比次數
25-34	3	$3/50=0.06$	6%
35-44	6	$6/50=0.12$	12%
45-54	8	$8/50=0.16$	16%
55-64	13	$13/50=0.26$	26%
65-74	8	$8/50=0.16$	16%
75-84	7	$7/50=0.14$	14%
85-94	5	$5/50=0.10$	10%
總計	50		100%

百分比次數

相對次數分配

統計表案例

累積次數分配

組限	次數	以下累積次數	以上累積次數	以下相對累積次數	以上相對累積次數
25-34	3	3	50	$3/50=0.06$	$50/50=1.00$
35-44	6	9	47	$9/50=0.18$	$47/50=0.94$
45-54	8	17	41	$17/50=0.34$	$41/50=0.82$
55-64	13	30	33	$30/50=0.60$	$33/50=0.66$
65-74	8	38	20	$38/50=0.76$	$20/50=0.40$
75-84	7	45	12	$45/50=0.90$	$12/50=0.24$
85-94	5	50	5	$50/50=1.00$	$5/50=0.10$
總計	50				

相對累積次數分配

統計表案例

交叉表（列聯表）：

表二：「士林次分區」與「目前教育狀況」之交叉分析

		士林七大次分區							總 和
		街上	後港	社子	芝山	蘭雅	天母	山上	
目前 教育 狀況	國中以下	17867 38.9%	30195 46.7%	9518 31.2%	10152 31.3%	9518 31.2%	16054 28.4%	7322 31.1%	104975 35.5%
	高中職	12788 27.8%	17133 26.5%	8017 26.3%	8461 26.1%	8017 26.3%	13820 24.5%	4888 20.8%	75623 25.6%
	大學、 專科	11013 24.0%	11211 17.3%	9578 31.4%	10507 32.4%	9578 31.4%	19902 35.3%	8690 36.9%	84344 28.5%
	研究所	803 1.7%	650 1.0%	1076 3.5%	1066 3.3%	1076 3.5%	2548 4.5%	1016 4.3%	8433 2.9%
	六歲以下 兒童	3463 7.5%	5467 8.5%	2317 7.6%	2208 6.8%	2317 7.6%	4111 7.3%	1612 6.9%	22065 7.5%
總 和		41987 100.0%	45934 100.0%	64656 100.0%	30506 100.0%	32394 100.0%	56435 100.0%	23528 100.0%	295440 100.0%

$$\chi^2 = 11098.150, p = .000$$



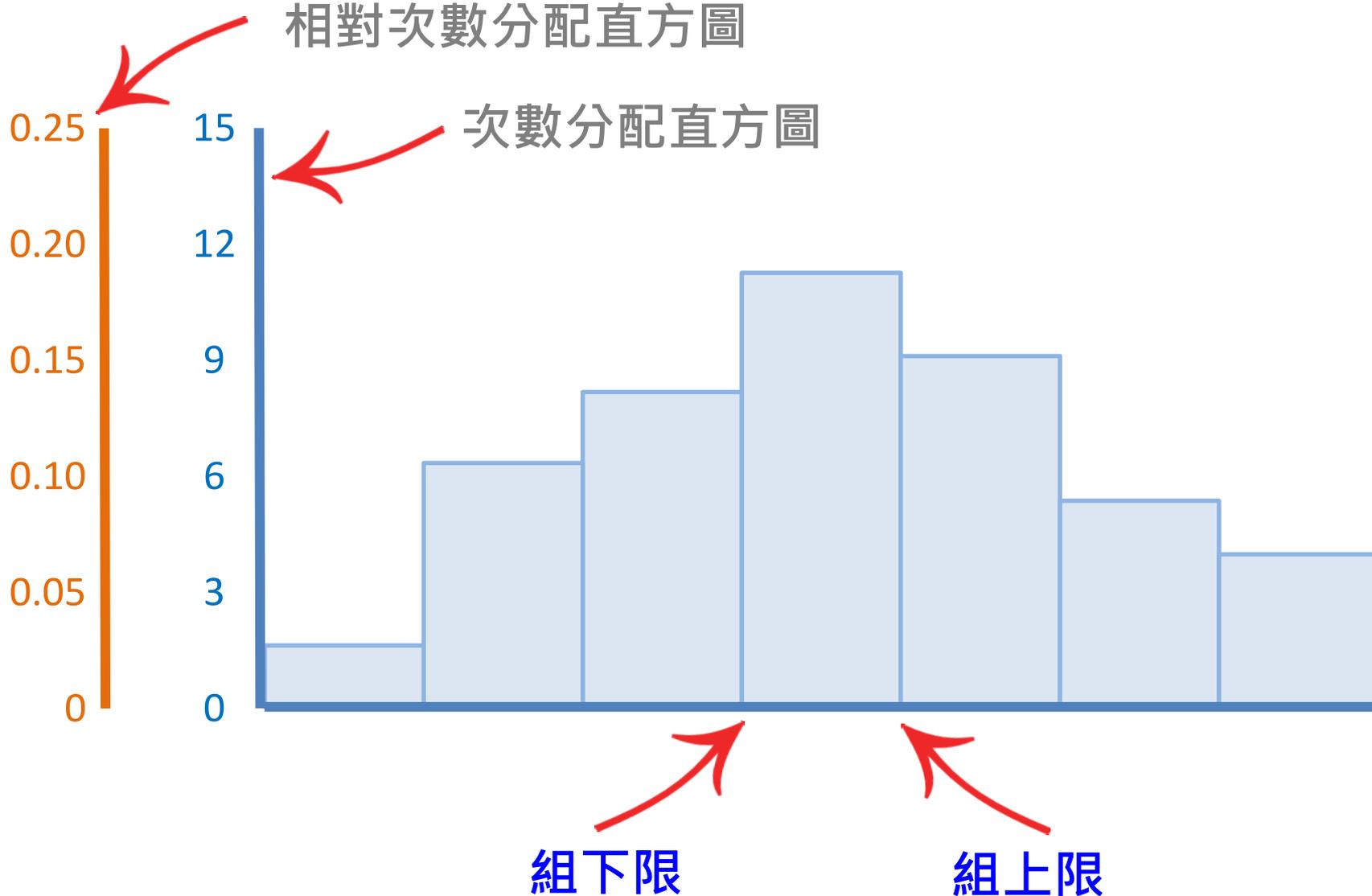
統計圖

用圖示呈現資料型態、趨勢

統計圖案例(直方圖)

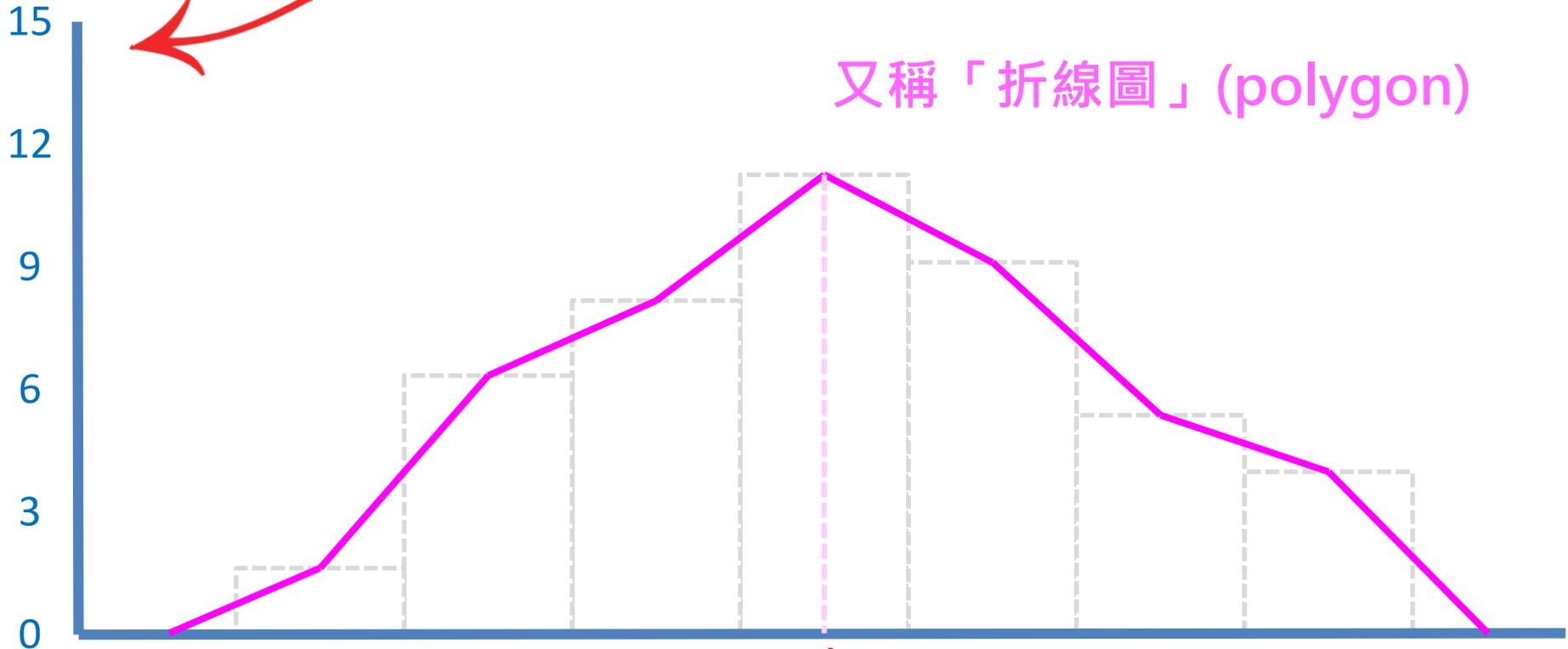
相對次數分配直方圖

次數分配直方圖



統計圖案例(多邊形圖)

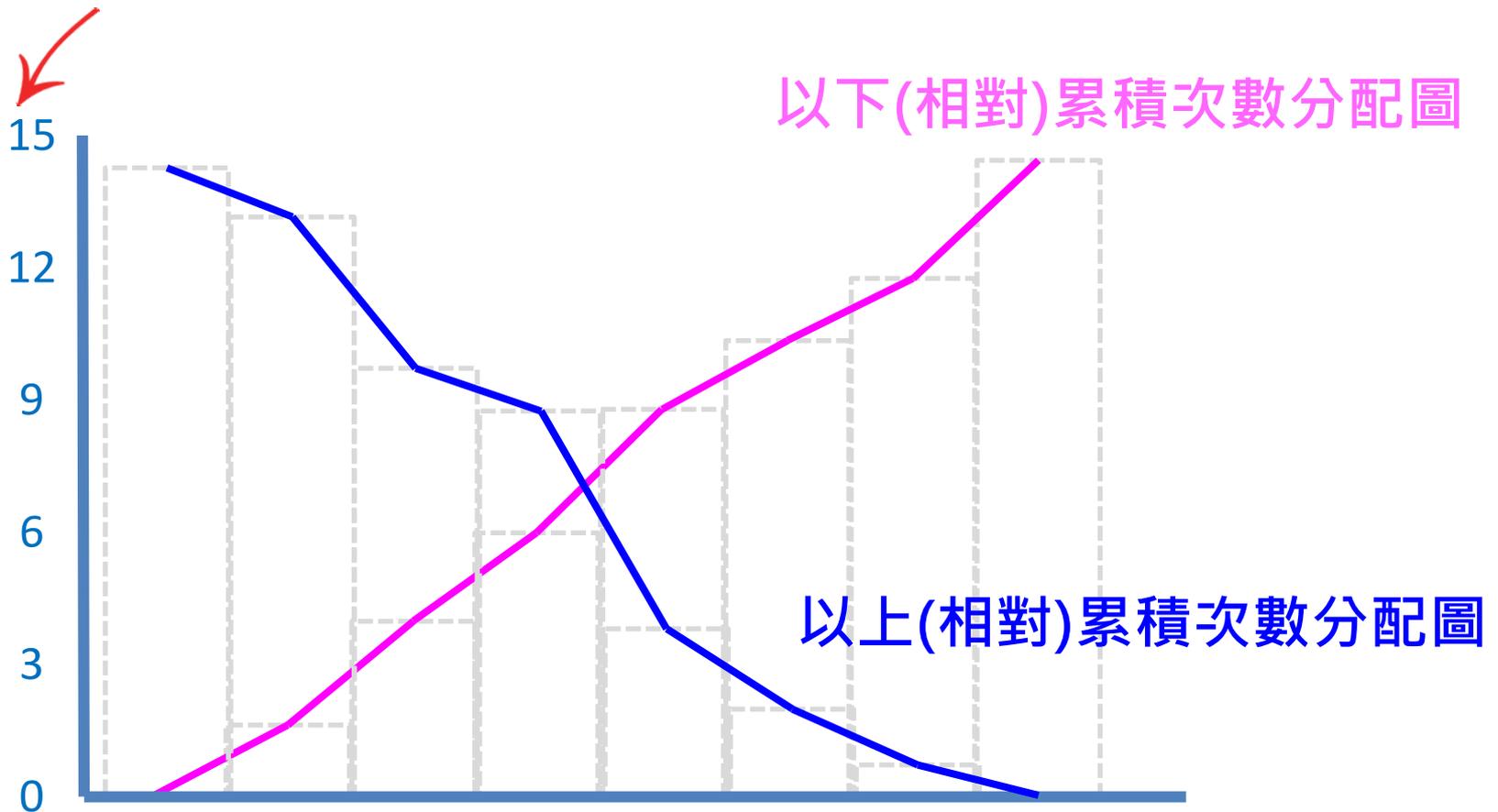
“次數”或“相對次數”



組中點

統計圖案例(累積次數分配圖)

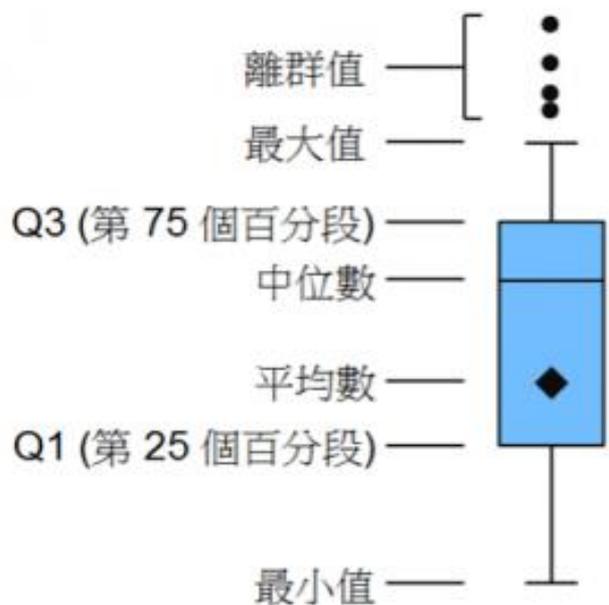
“次數” 或 “相對次數”



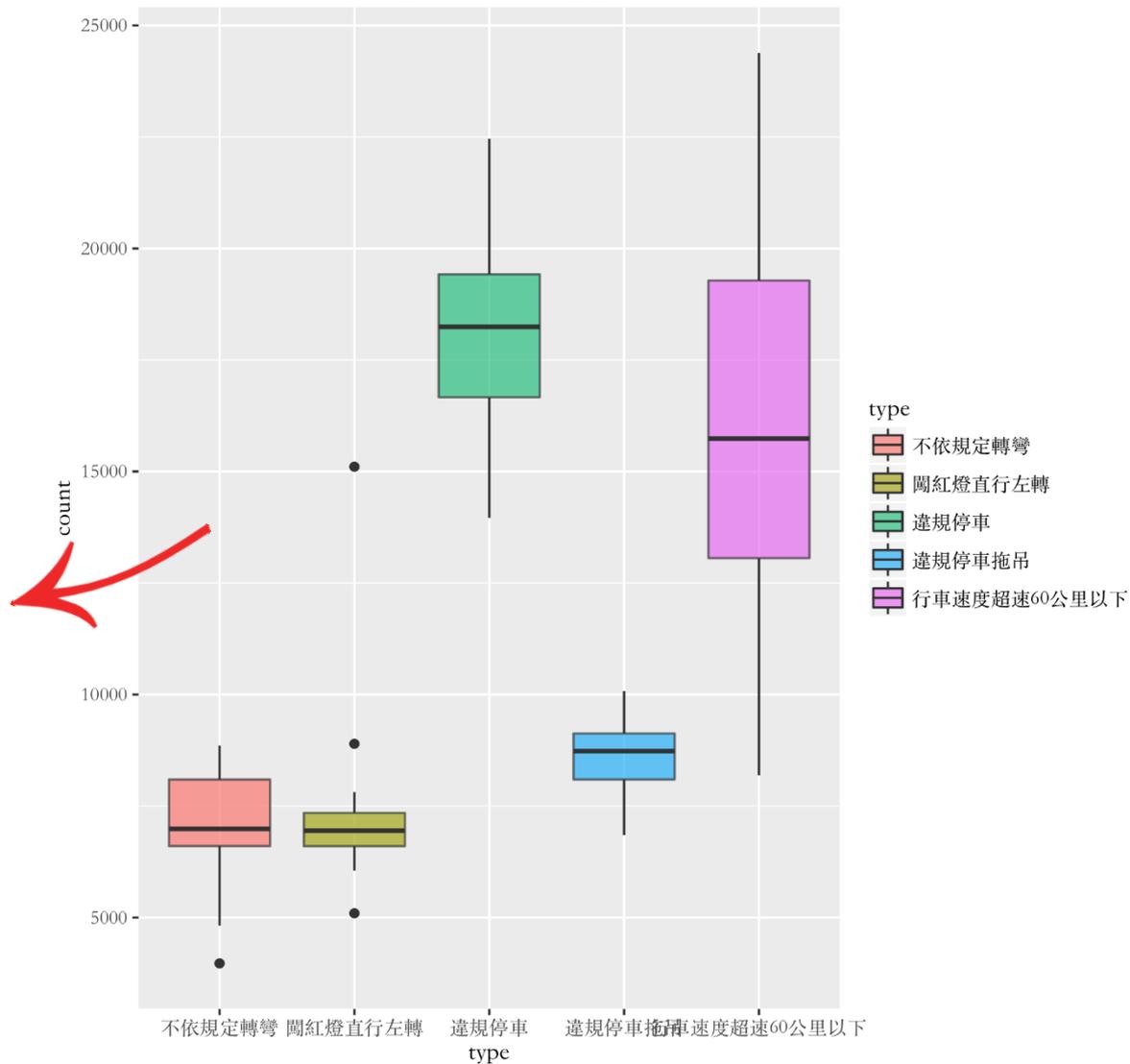
統計圖案例(盒鬚圖)

(box plot)

顯示所有資料分布的情況

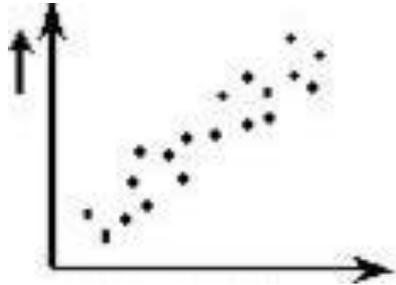


104年交通違規盒鬚圖

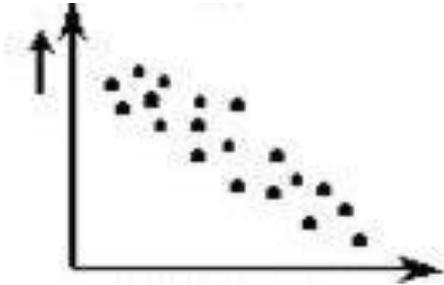


統計圖案例(散佈圖)

(scatter diagram)



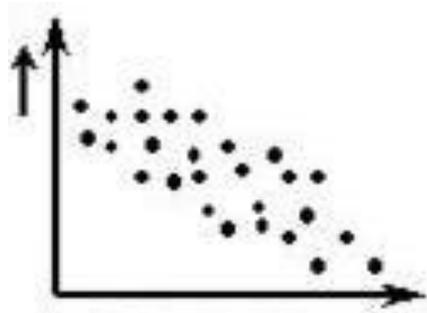
強正相關



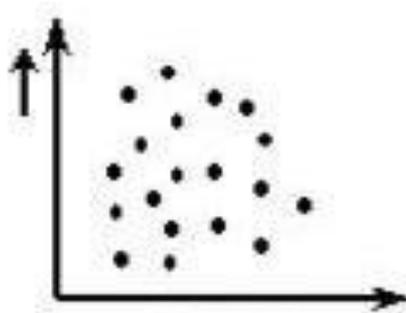
強負相關



弱正相關



弱負相關



不相關



非線性相關

統計圖案例(Q-Q圖)

(quantile-quantile plot)

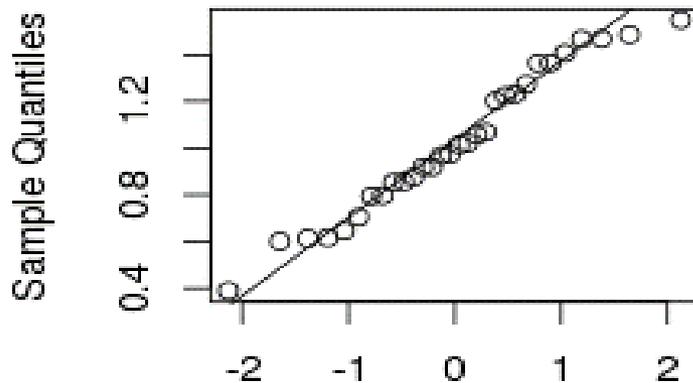
- 可用來比較兩變數間的差異程度
- 分佈點靠近45度直線，表差異小；遠離則表差異大
- 可作為兩變數變異數的初步檢定：
- 繪製方法：

Step1 ~ 將兩類數值資料按照大小排列

Step2 ~ 再將對應的排序的數值視為一組一組的座標組合

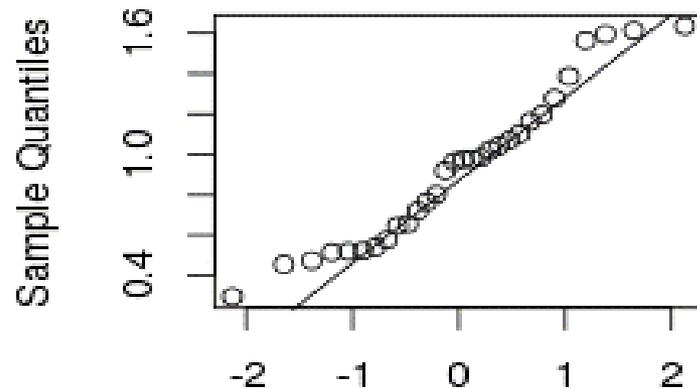
Step3 ~ 將各組座標標示在圖上

Normal Q-Q Plot



Theoretical Quantiles

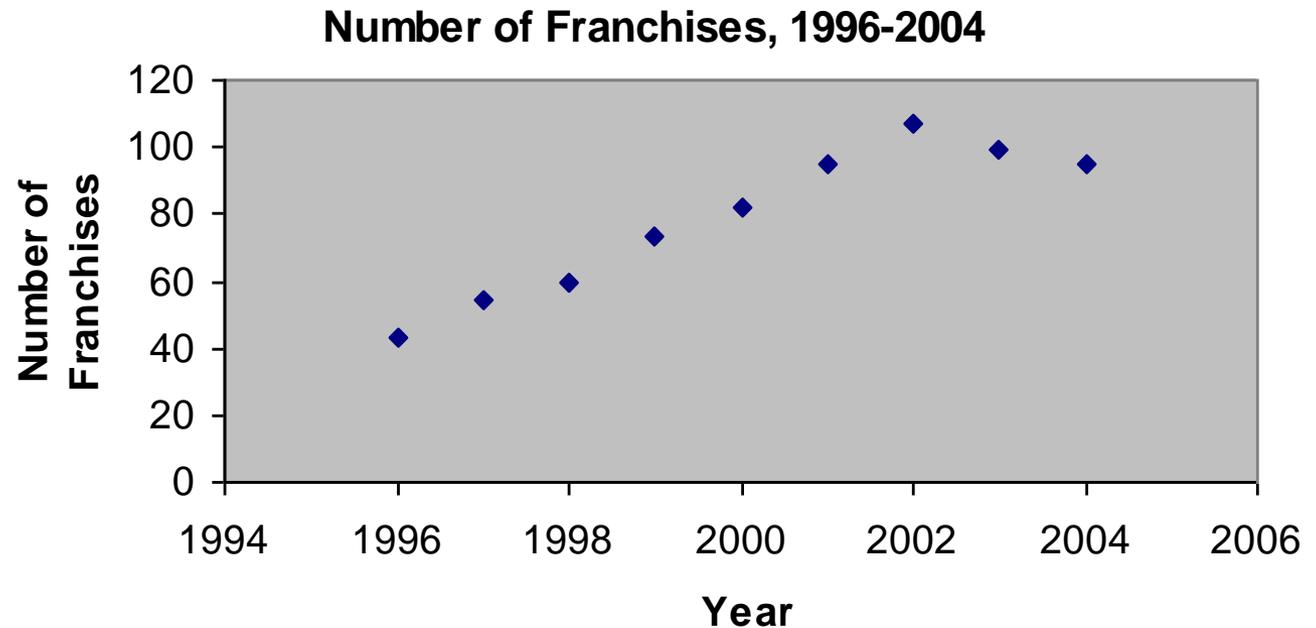
Normal Q-Q Plot



Theoretical Quantiles

時間數列 (Time Series Plot)

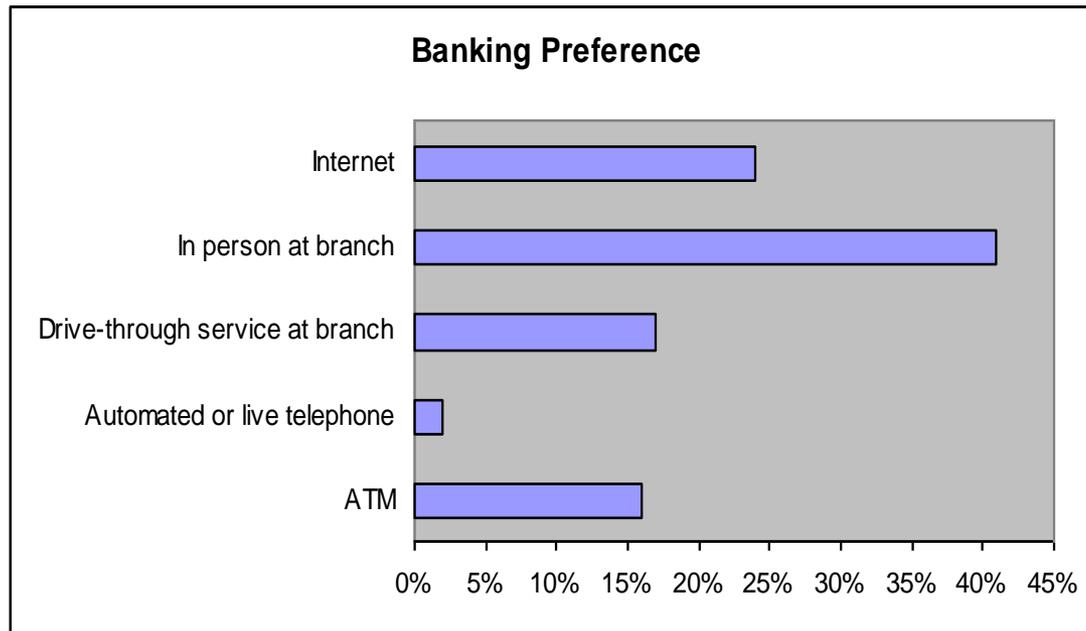
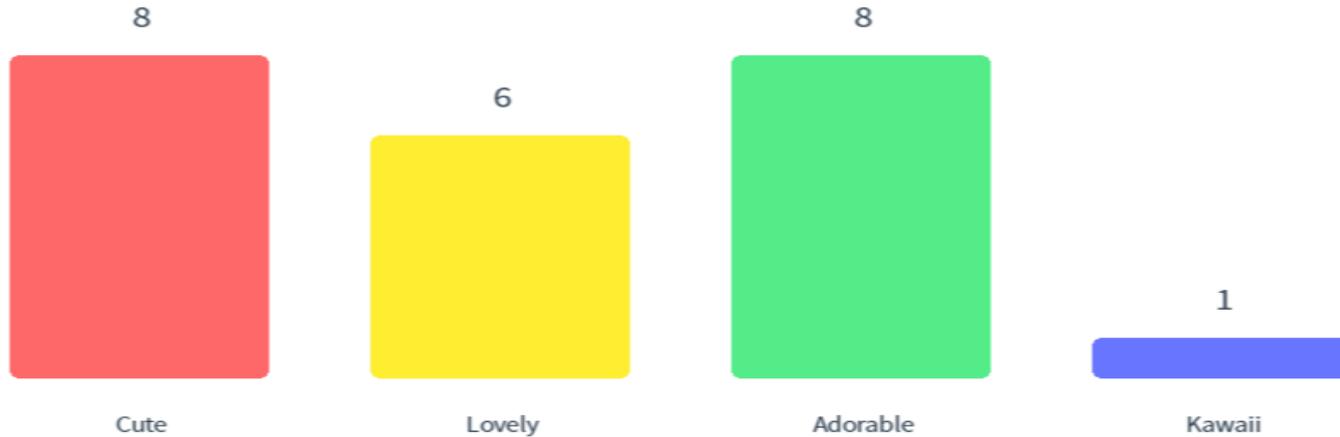
Year	Number of Franchises
1996	43
1997	54
1998	60
1999	73
2000	82
2001	95
2002	107
2003	99
2004	95



按照時間順序標示觀測值的分布圖，可看出資料隨著時間走勢而產生的變化情形。

統計圖案例(長條圖)

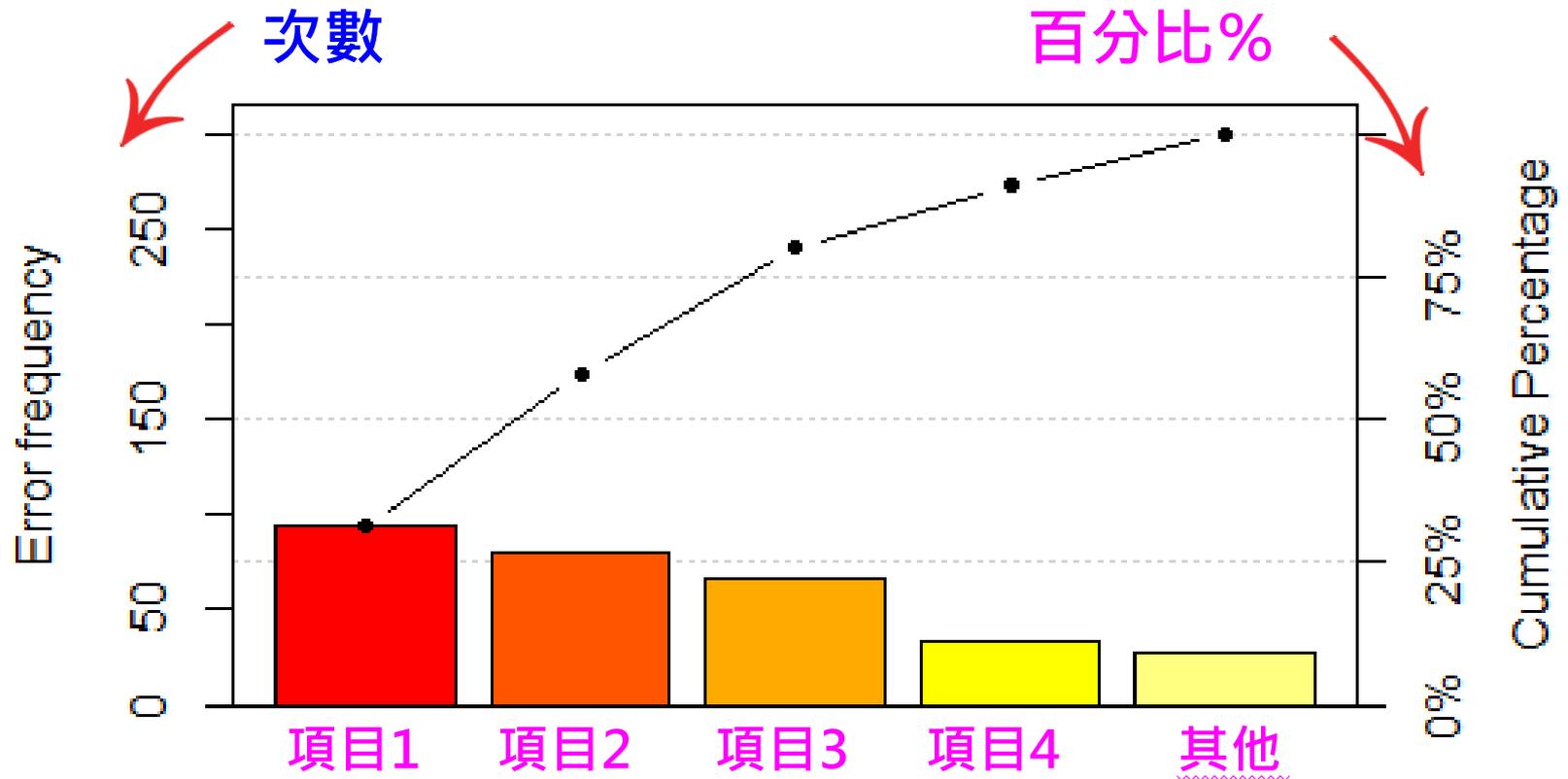
(bar chart)



統計圖案例(柏拉圖，定性資料)

(pareto chart)

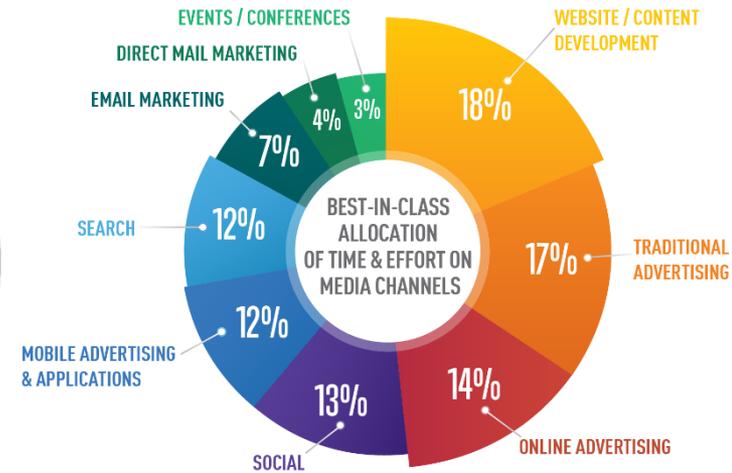
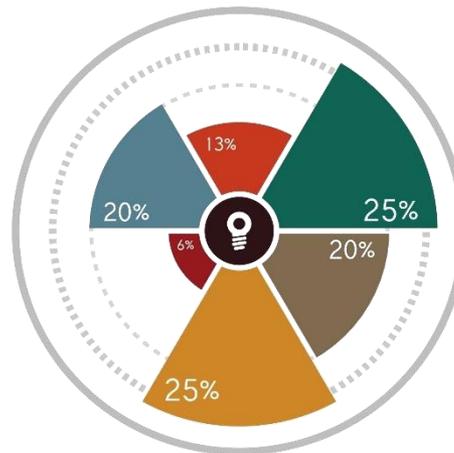
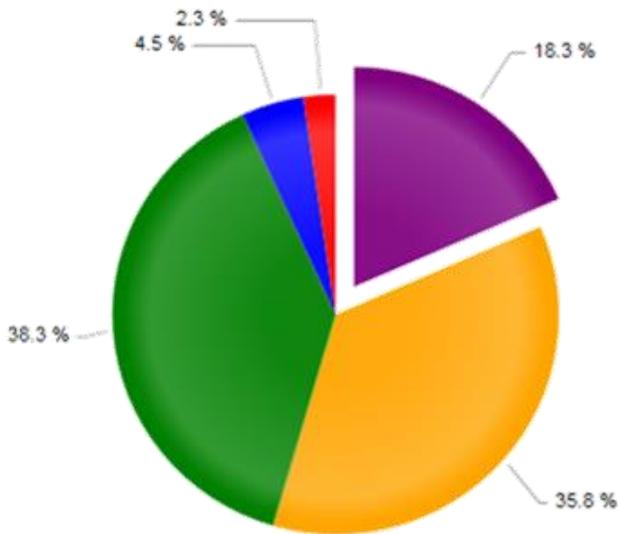
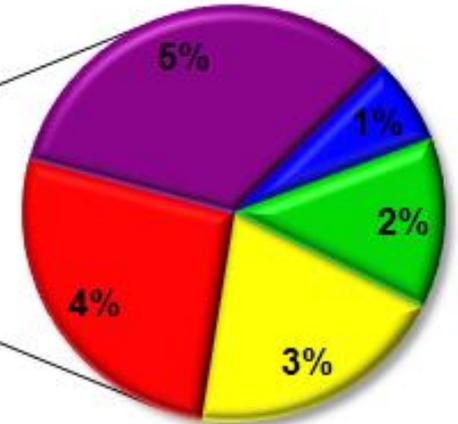
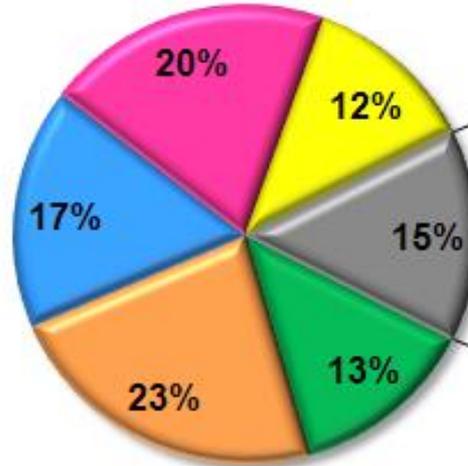
- 特殊的長條圖，又稱為「重點分析圖」，在品質管制中常被用到
- 繪製方法：
 - (1)先將各類型之次數依大小順序由大到小排列；
 - (2)將「次數」與「相對累積次數」皆繪製在圖上



統計圖案例(圓面積圖, 圓餅圖)

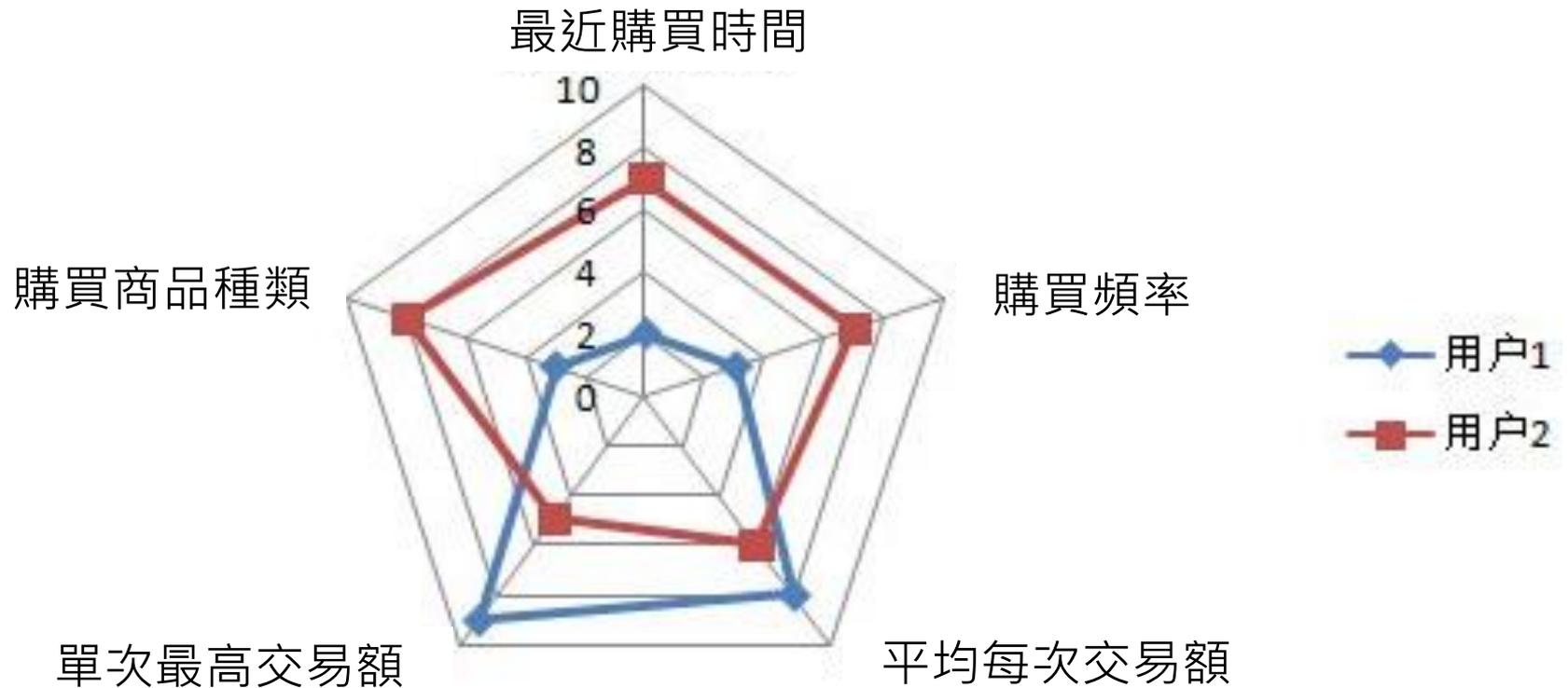
(pie chart)

基本圖形



SOURCE: 2015 MILLWARD BROWN DIGITAL "GETTING DIGITAL RIGHT" STUDY

統計圖案例(雷達圖)





Graphical Errors

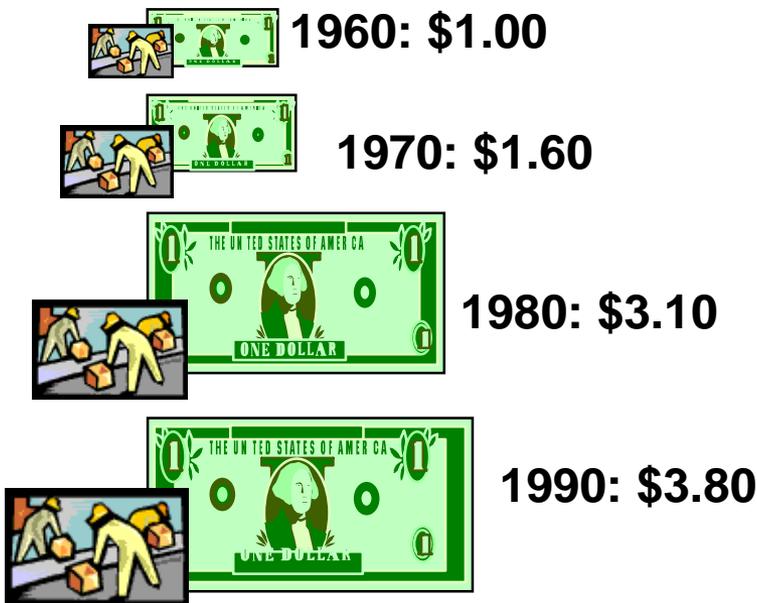
不要讓人產生認知的誤判

Graphical Errors: Chart Junk

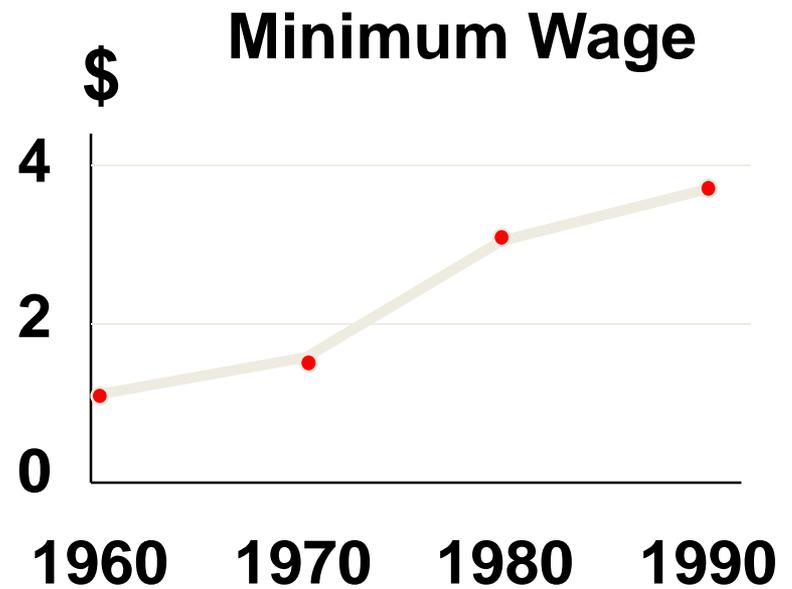


Bad Presentation

Minimum Wage



Good Presentation



Graphical Errors: No Relative Basis



Bad Presentation

A's received by students.

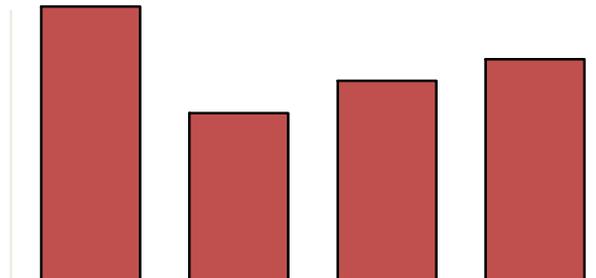
Freq.

300

200

100

0



FR

SO

JR

SR



Good Presentation

A's received by students.

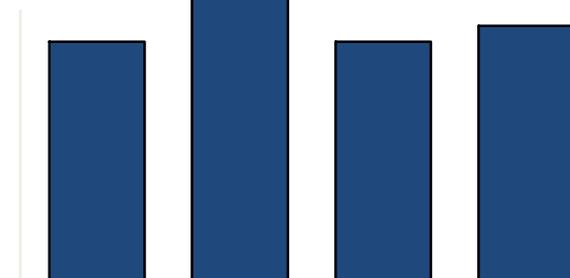
%

30%

20%

10%

0%



FR

SO

JR

SR

FR = Freshmen, SO = Sophomore, JR = Junior, SR = Senior

Graphical Errors: Compressing the Vertical Axis



Bad Presentation



Good Presentation



Graphical Errors: No Zero Point on the Vertical Axis

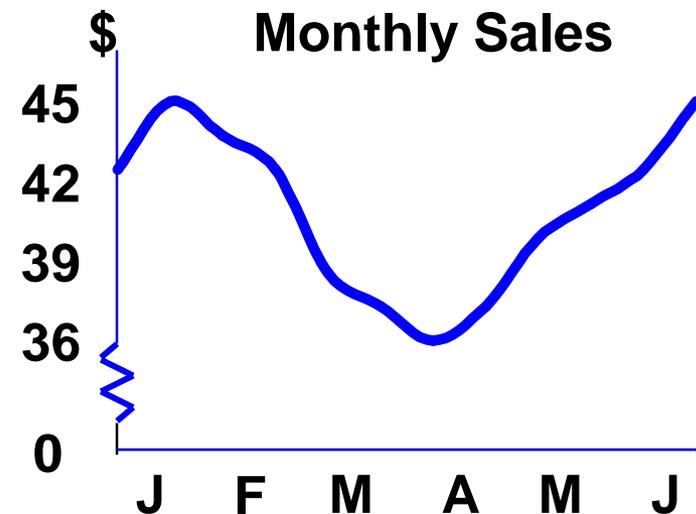
DCOVA



Bad Presentation



Good Presentations



Graphing the first six months of sales



The End