CIS 320 Data Analysis Final Report:

Professor: Phillip D. Thomas

Billy La

Introduction:

This report is about the final step of my data, which I am going to analysis. My final report include all my data is being analysis. I use excel, SPSS statistic, SPSS Amos and R to analysis all my data. I analysis the population estimate. The data is taking from United States Census Bureau. There are one set of data and the data is about the population estimate on sumlev, region, devision, state, census2010 population estimate, estimatebase of year 2010, population estimate of year 2014-2015, death of year 2014 -2015, birth of years 2014-2015.

Hypothesis:

I am going to find the relationshiop between the number of population between year 2014-2015. The purpose is to monitor and the grow of us population between the year of 2014-2015. Also, I will do the monitor on the number of death and the number of birth on years 2014-2015. I will use calculation of statistic to see the different between those 2 unit.

Goals:

I am going to user the pivot table to separate and summary my data include the sumofdeath and sumofbirth of year 2014-2015. Also, the data of populaiton on year 2014-2015 are include in pivot table. After finish the pivot table, I save my data as .csv file. After the save of my data, I insert to IBM spss to do the freqency and t-test for my data. The resourece is going to show accroding to the picture below. After done with the spss analysis, I will use IBM amos for the regression linear to predict the number of death, birth and the populartion of the future year. The final step, which is using R to graph the division of region and summary all the data.

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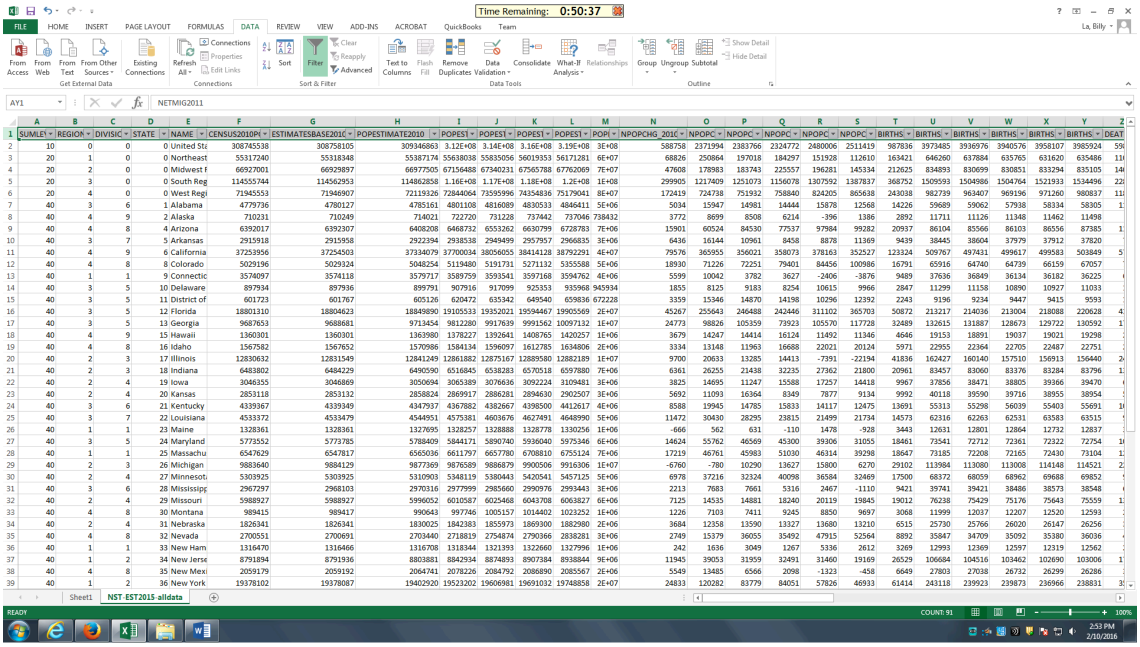
Collect and manage data

The population estimate data is collected from http://www.census.gov/popest/data/index.html The time domain is Sep. 17, 2014



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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	SUMLE	REGION	DIVISIC	STATE	NAME	CENSUS2010P(	ESTIMATESBASE2010	POPESTIMATE2010	POPEST	POPEST	POPEST	POPEST	POPI	NPOPCHG_2010	NPOPC	NPOPC	NPOPC	NPOPC	NPOPC	BIRTHS	BIRTHS	BIRTHS	BIRTHS	BIRTHS	BIRTHS	DEAT
2	10	0	0	0	United Sta	308745538	308758105	309346863	3.12E+08	3.14E+08	3.16E+08	3.19E+08	3E+08	588758	2371994	2383766	2324772	2480006	2511419	987836	3973485	3936976	3940576	3958107	3985924	59
3	20	1	0	0	Northeast	55317240	55318348	55387174	55638038	55835056	56019353	56171281	6E+07	68826	250864	197018	184297	151928	112610	163421	646260	637884	635765	631620	635486	11
4	20	2	0	0	Midwest F	66927001	66929897	66977505	67156488	67340231	67565788	67762069	7E+07	47608	178983	183743	225557	196281	145334	212625	834893	830699	830851	833294	835105	14
5	20	3	0	0	South Reg	114555744	114562953	114862858	1.16E+08	1.17E+08	1.18E+08	1.2E+08	1E+08	299905	1217409	1251073	1156078	1307592	1387837	368752	1509593	1504986	1504764	1521933	1534496	22
6	20	4	0	0	West Regi	71945553	71946907	72119326	72844064	73595996	74354836	75179041	8E+07	172419	724738	751932	758840	824205	865638	243038	982739	963407	969196	971260	980837	11
7	40	3	6	1	Alabama	4779736	4780127	4785161	4801108	4816089	4830533	4846411	5E+06	5034	15947	14981	14444	15878	12568	14226	59689	59062	57938	58334	58305	1
8	40	4	9	2	Alaska	710231	710249	714021	722720	731228	737442	737046	738432	3772	8699	8508	6214	-396	1386	2892	11711	11126	11348	11462	11498	
9	40	4	8	4	Arizona	6392017	6392307	6408208	6468732	6553262	6630799	6728783	7E+06	15901	60524	84530	77537	97984	99282	20937	86104	85566	86103	86556	87385	1
10	40	3	7	5	Arkansas	2915918	2915958	2922394	2938538	2949499	2957957	2966835	3E+06	6436	16144	10961	8458	8878	11369	9439	38445	38604	37979	37912	37820	
11	40	4	9	6	California	37253956	37254503	37334079	37700034	38056055	38414128	38792291	4E+07	79576	365955	356021	358073	378163	352527	123324	509767	497431	499617	499583	503849	5
12	40	4	8	8	Colorado	5029196	5029324	5048254	5119480	5191731	5271132	5355588	5E+06	18930	71226	72251	79401	84456	100986	16791	65916	64740	64739	66159	67057	
13	40	1	1	9	Connectic	3574097	3574118	3579717	3589759	3593541	3597168	3594762	4E+06	5599	10042	3782	3627	-2406	-3876	9489	37636	36849	36134	36182	36225	
14	40	3	5	10	Delaware	897934	897936	899791	907916	917099	925353	935968	945934	1855	8125	9183	8254	10615	9966	2847	11299	11158	10890	10927	11033	
15	40	3	5	11	District of	601723	601767	605126	620472	635342	649540	659836	672228	3359	15346	14870	14198	10296	12392	2243	9196	9234	9447	9415	9593	
16	40	3	5	12	Florida	18801310	18804623	18849890	19105533	19352021	19594467	19905569	2E+07	45267	255643	246488	242446	311102	365703	50872	213217	214036	213004	218088	220628	4
17	40	3	5	13	Georgia	9687653	9688681	9713454	9812280	9917639	9991562	10097132	1E+07	24773	98826	105359	73923	105570	117728	32489	132615	131887	128673	129722	130592	1
18	40	4	9	15	Hawaii	1360301	1360301	1363980	1378227	1392641	1408765	1420257	1E+06	3679	14247	14414	16124	11492	11346	4646	19153	18891	19037	19021	19298	
19	40	4	8	16	Idaho	1567582	1567652	1570986	1584134	1596097	1612785	1634806	2E+06	3334	13148	11963	16688	22021	20124	5971	22955	22364	22705	22487	22751	
20	40	2	3	17	Illinois	12830632	12831549	12841249	12861882	12875167	12889580	12882189	1E+07	9700	20633	13285	14413	-7391	-22194	41836	162427	160140	157510	156913	156440	2
21	40	2	3	18	Indiana	6483802	6484229	6490590	6516845	6538283	6570518	6597880	7E+06	6361	26255	21438	32235	27362	21800	20961	83457	83060	83376	83284	83796	1
22	40	2	4	19	Iowa	3046355	3046869	3050694	3065389	3076636	3092224	3109481	3E+06	3825	14695	11247	15588	17257	14418	9967	37856	38471	38805	39366	39470	
23	40	2	4	20	Kansas	2853118	2853132	2858824	2869917	2886281	2894630	2902507	3E+06	5692	11093	16364	8349	7877	9134	9992	40118	39590	39716	38955	38954	
24	40	3	6	21	Kentucky	4339367	4339349	4347937	4367882	4382667	4398500	4412617	4E+06	8588	19945	14785	15833	14117	12475	13691	55313	55298	56039	55403	55691	1
25	40	3	7	22	Louisiana	4533372	4533479	4544951	4575381	4603676	4627491	4648990	5E+06	11472	30430	28295	23815	21499	21734	14573	62316	62263	62531	63583	63515	
26	40	1	1	23	Maine	1328361	1328361	1327695	1328257	1328888	1328778	1330256	1E+06	-666	562	631	-110	1478	-928	3443	12631	12801	12864	12732	12837	
27	40	3	5	24	Maryland	5773552	5773785	5788409	5844171	5890740	5936040	5975346	6E+06	14624	55762	46569	45300	39306	31055	18461	73541	72712	72361	72322	72754	1
28	40	1	1	25	Massachu	6547629	6547817	6565036	6611797	6657780	6708810	6755124	7E+06	17219	46761	45983	51030	46314	39298	18647	73185	72208	72165	72430	73104	1
29	40	2	3	26	Michigan	9883640	9884129	9877369	9876589	9886879	9900506	9916306	1E+07	-6760	-780	10290	13627	15800	6270	29102	113984	113080	113008	114148	114521	2
30	40	2	4	27	Minnesot	5303925	5303925	5310903	5348119	5380443	5420541	5457125	5E+06	6978	37216	32324	40098	36584	32469	17500	68372	68059	68962	69688	69852	
31	40	3	6	28	Mississipp	2967297	2968103	2970316	2977999	2985660	2990976	2993443	3E+06	2213	7683	7661	5316	2467	-1110	9421	39741	39421	38486	38573	38548	
32	40	2	4	29	Missouri	5988927	5988927	5996052	6010587	6025468	6043708	6063827	6E+06	7125	14535	14881	18240	20119	19845	19012	76238	75429	75176	75643	75559	1
33	40	4	8	30	Montana	989415	989417	990643	997746	1005157	1014402	1023252	1E+06	1226	7103	7411	9245	8850	9697	3068	11999	12037	12207	12520	12593	
34	40	2	4	31	Nebraska	1826341	1826341	1830025	1842383	1855973	1869300	1882980	2E+06	3684	12358	13590	13327	13680	13210	6515	25730	25766	26020	26147	26256	
35	40	4	8	32	Nevada	2700551	2700691	2703440	2718819	2754874	2790366	2838281	3E+06	2749	15379	36055	35492	47915	52564	8892	35847	34709	35092	35380	36036	
36	40	1	1	33	New Ham	1316470	1316466	1316708	1318344	1321393	1322660	1327996	1E+06	242	1636	3049	1267	5336	2612	3269	12993	12369	12597	12319	12562	
37	40	1	2	34	New Jerse	8791894	8791936	8803881	8842934	8874893	8907384	8938844	9E+06	11945	39053	31959	32491	31460	19169	26529	106684	104516	103462	102690	103006	1
38	40	4	8	35	New Mexi	2059179	2059192	2064741	2078226	2084792	2086890	2085567	2E+06	5549	13485	6566	2098	-1323	-458	6649	27803	27038	26732	26299	26286	
39	40	1	2	36	New York	19378102	19378087	19402920	19523202	19606981	19691032	19748858	2E+07	24833	120282	83779	84051	57826	46933	61414	243118	239923	239873	236966	238831	3

Build the model

Excel, IBM SPSS, and R are the tools for my data analysis. The data that shows the Sum of popluation of years 2014-2015, Sum of BIRTHS2015, Sum of DEATHS2015 from all the state have been choose and processed to pivot table on Excel. Also, those data have been processed to SPSS to calculate the frequency include mean, median, mode, standard deviation, and variance. My data is a quantative data set.

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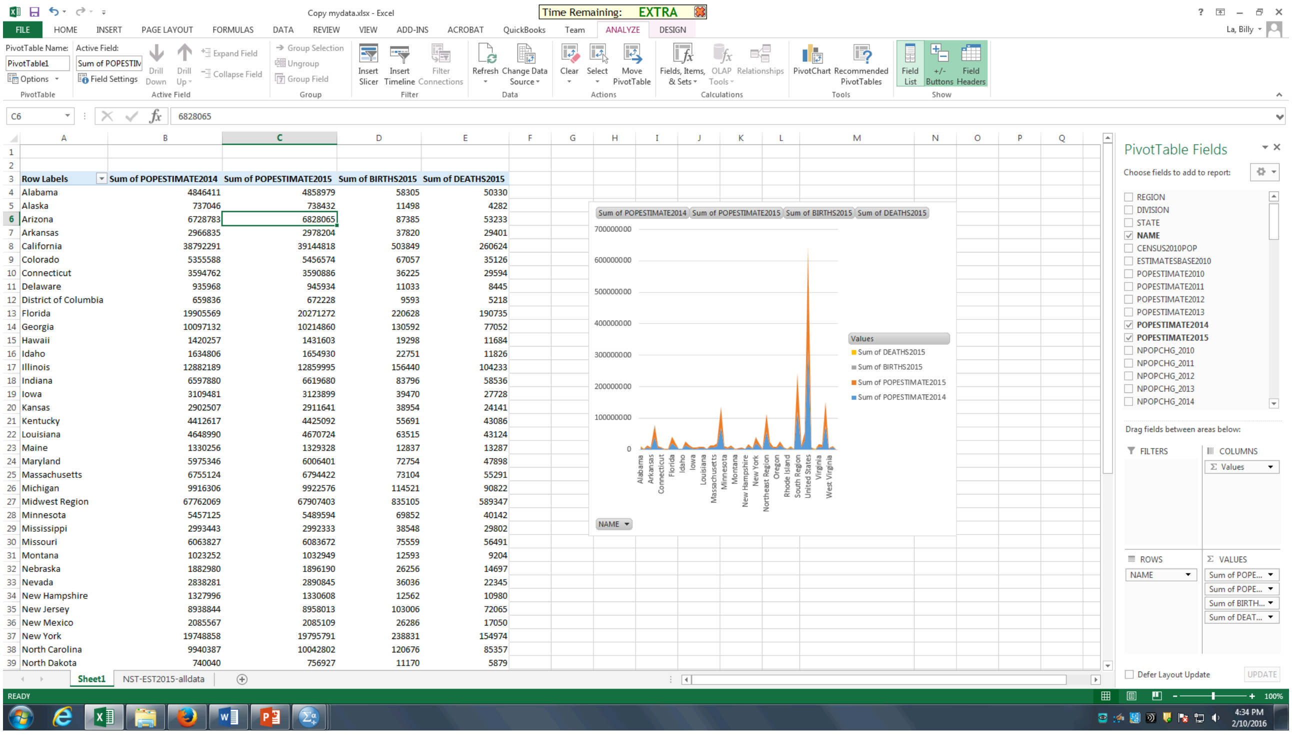

PivotTable Name: PivotTable1

Active Field: Sum of POPESTIM

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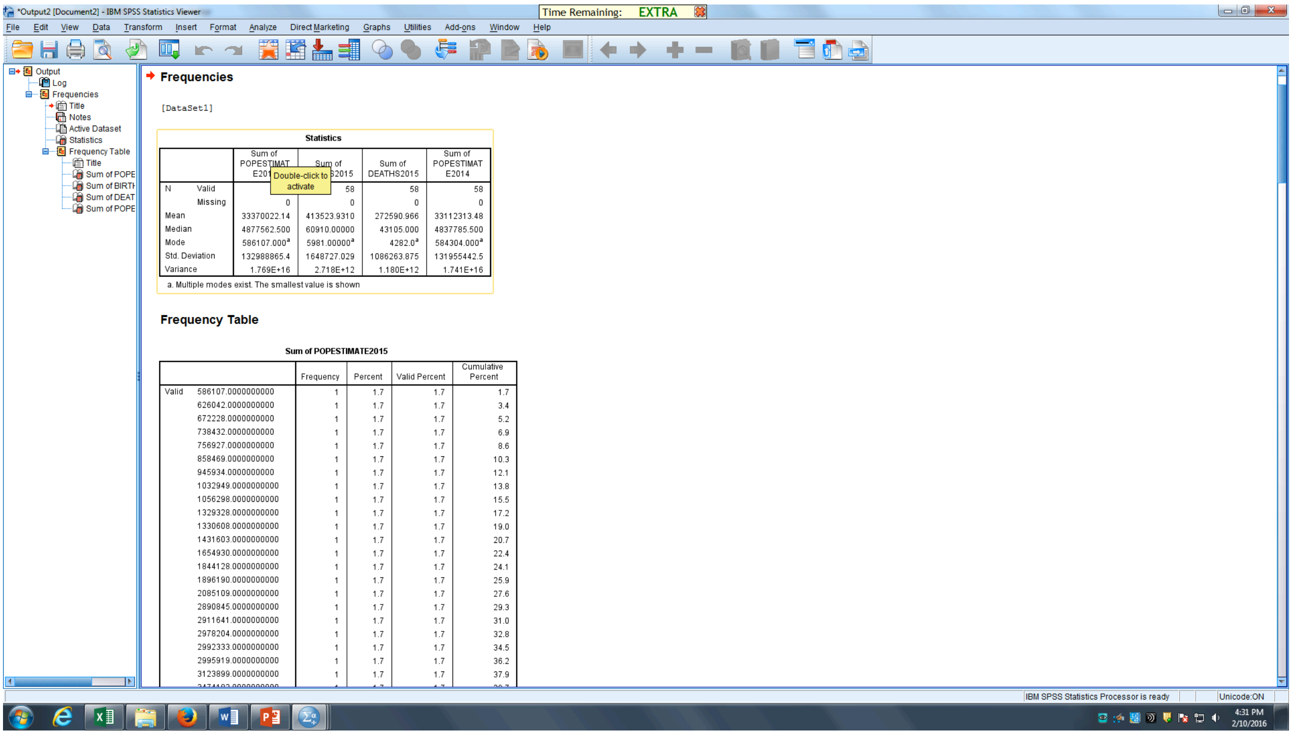
Row Labels	Sum of POPESTIMATE2014	Sum of POPESTIMATE2015	Sum of BIRTHS2015	Sum of DEATHS2015
Alabama	4846411	4858979	58305	50330
Alaska	737046	738432	11498	4282
Arizona	6728783	6828065	87385	53233
Arkansas	2966835	2978204	37820	29401
California	38792291	39144818	503849	260624
Colorado	5355588	5456574	67057	35126
Connecticut	3594762	3590886	36225	29594
Delaware	935968	945934	11033	8445
District of Columbia	659836	672228	9593	5218
Florida	19905569	20271272	220628	190735
Georgia	10097132	10214860	130592	77052
Hawaii	1420257	1431603	19298	11684
Idaho	1634806	1654930	22751	11826
Illinois	12882189	12859995	156440	104233
Indiana	6597880	6619680	83796	58536
Iowa	3109481	3123899	39470	27728
Kansas	2902507	2911641	38954	24141
Kentucky	4412617	4425092	55691	43086
Louisiana	4648990	4670724	63515	43124
Maine	1330256	1329328	12837	13287
Maryland	5975346	6006401	72754	47898
Massachusetts	6755124	6794422	73104	55291
Michigan	9916306	9922576	114521	90822
Midwest Region	67762069	67907403	835105	589347
Minnesota	5457125	5489594	69852	40142
Mississippi	2993443	2992333	38548	29802
Missouri	6063827	6083672	75559	56491
Montana	1023252	1032949	12593	9204
Nebraska	1882980	1896190	26256	14697
Nevada	2838281	2890845	36036	22345
New Hampshire	1327996	1330608	12562	10980
New Jersey	8938844	8958013	103006	72065
New Mexico	2085567	2085109	26286	17050
New York	19748858	19795791	238831	154974
North Carolina	9940387	10042802	120676	85357
North Dakota	740040	756927	11170	5879

☐ REGION
☐ DIVISION
☐ STATE
☑ NAME
☐ CENSUS2010POP
☐ ESTIMATESBASE2010
☐ POPESTIMATE2010
☐ POPESTIMATE2011
☐ POPESTIMATE2012
☐ POPESTIMATE2013
☑ POPESTIMATE2014
☑ POPESTIMATE2015
☐ NPOPCHG_2010
☐ NPOPCHG_2011
☐ NPOPCHG_2012
☐ NPOPCHG_2013
☐ NPOPCHG_2014



Frequencies

[DataSet1]

Statistics

		Sum of POPESTIMAT E201	Sum of S2015	Sum of DEATHS2015	Sum of POPESTIMAT E2014
N	Valid		58	58	58
	Missing	0	0	0	0
Mean		33370022.14	413523.9310	272590.966	33112313.48
Median		4877562.500	60910.00000	43105.000	4837785.500
Mode		586107.000[a]	5981.00000[a]	4282.0[a]	584304.000[a]
Std. Deviation		132988865.4	1648727.029	1086263.875	131955442.5
Variance		1.769E+16	2.718E+12	1.180E+12	1.741E+16

a. Multiple modes exist. The smallest value is shown

Frequency Table

Sum of POPESTIMATE2015

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	586107.0000000000	1	1.7	1.7	1.7
	626042.0000000000	1	1.7	1.7	3.4
	672228.0000000000	1	1.7	1.7	5.2
	738432.0000000000	1	1.7	1.7	6.9
	756927.0000000000	1	1.7	1.7	8.6
	858469.0000000000	1	1.7	1.7	10.3
	945934.0000000000	1	1.7	1.7	12.1
	1032949.0000000000	1	1.7	1.7	13.8
	1056298.0000000000	1	1.7	1.7	15.5
	1329328.0000000000	1	1.7	1.7	17.2
	1330608.0000000000	1	1.7	1.7	19.0
	1431603.0000000000	1	1.7	1.7	20.7
	1654930.0000000000	1	1.7	1.7	22.4
	1844128.0000000000	1	1.7	1.7	24.1
	1896190.0000000000	1	1.7	1.7	25.9
	2085109.0000000000	1	1.7	1.7	27.6
	2890845.0000000000	1	1.7	1.7	29.3
	2911641.0000000000	1	1.7	1.7	31.0
	2978204.0000000000	1	1.7	1.7	32.8
	2992333.0000000000	1	1.7	1.7	34.5
	2995919.0000000000	1	1.7	1.7	36.2
	3123899.0000000000	1	1.7	1.7	37.9

Acroding to the statistics table, the population is increasing thought years 2014-2015 and the birth of years 2015 far more than the death of 2015.

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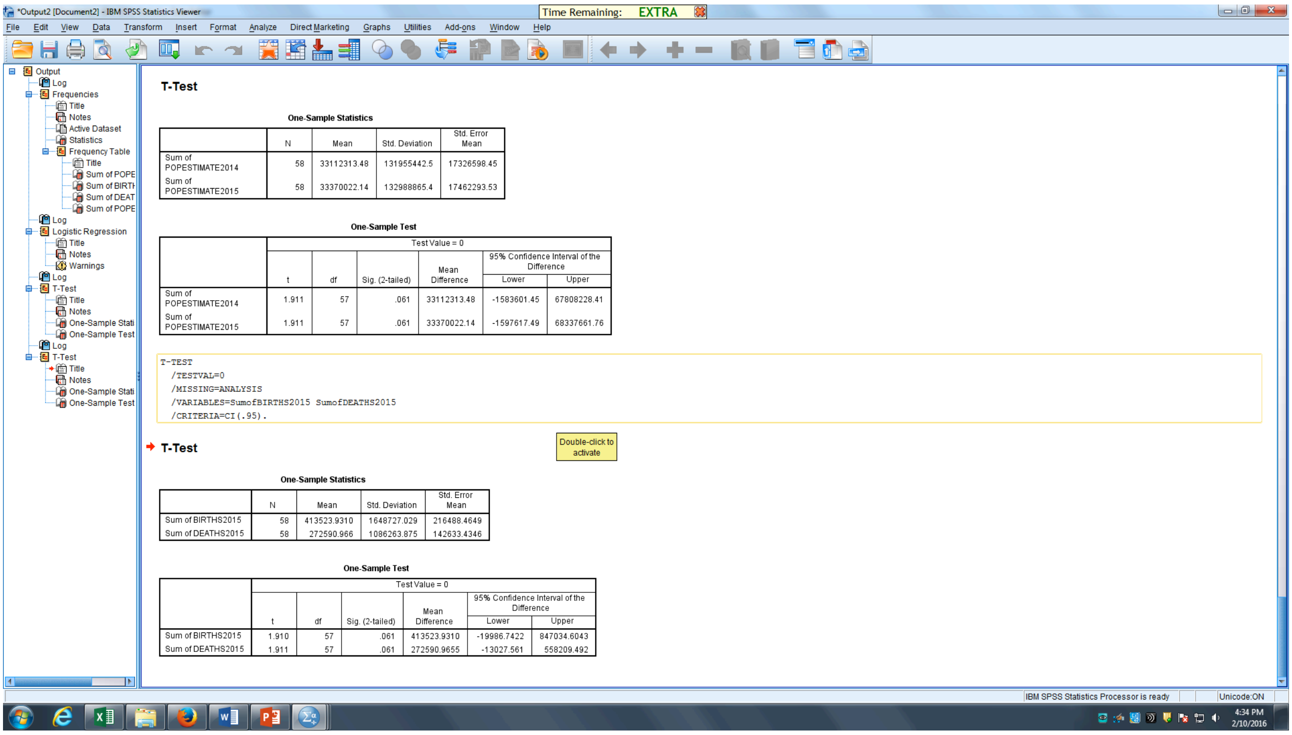
I use compare mean in one sample to t-test to compare the mean between the population between 2014-2015 and between the death and birth in years 2015.



T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Sum of POPESTIMATE2014	58	33112313.48	131955442.5	17326598.45
Sum of POPESTIMATE2015	58	33370022.14	132988865.4	17462293.53

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
Sum of POPESTIMATE2014	1.911	57	.061	33112313.48	-1583601.45	67808228.41
Sum of POPESTIMATE2015	1.911	57	.061	33370022.14	-1597617.49	68337661.76

```
T-TEST
  /TESTVAL=0
  /MISSING=ANALYSIS
  /VARIABLES=SumofBIRTHS2015 SumofDEATHS2015
  /CRITERIA=CI(.95).
```

T-Test

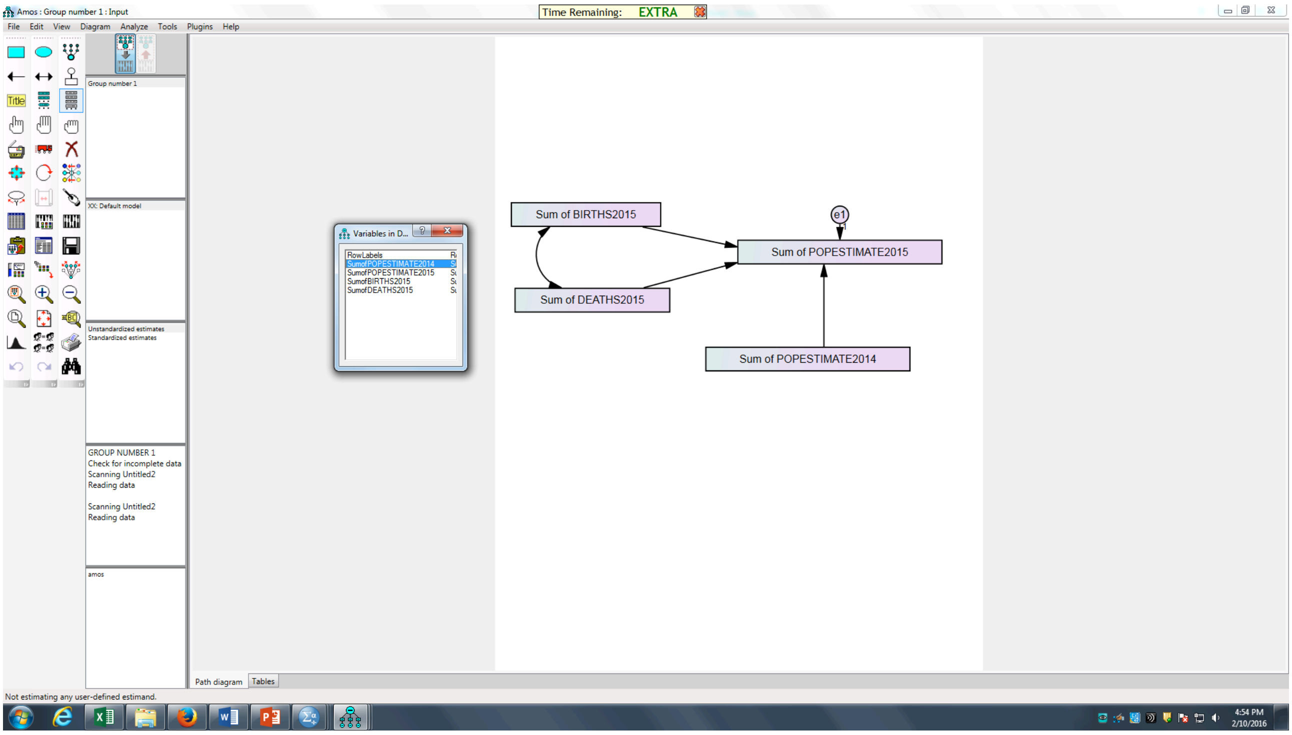
One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Sum of BIRTHS2015	58	413523.9310	1648727.029	216488.4649
Sum of DEATHS2015	58	272590.966	1086263.875	142633.4346

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
Sum of BIRTHS2015	1.910	57	.061	413523.9310	-19986.7422	847034.6043
Sum of DEATHS2015	1.911	57	.061	272590.9655	-13027.561	558209.492

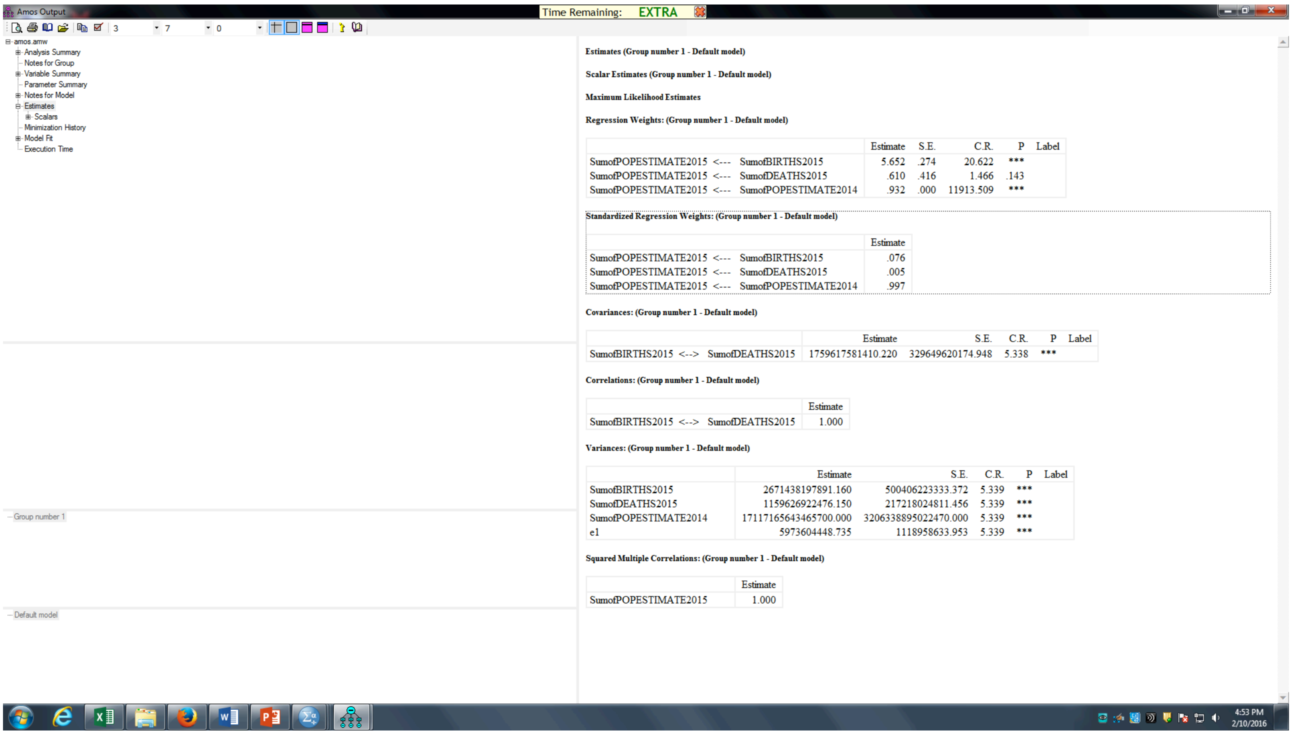
Amos model for linear regression analysis and ANOVA and ANCOVA



GROUP NUMBER 1
Check for incomplete data
Scanning Untitled2
Reading data

Scanning Untitled2
Reading data

Not estimating any user-defined estimand.



Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
SumofPOPESTIMATE2015	<---	SumofBIRTHS2015	5.652	.274	20.622	***	
SumofPOPESTIMATE2015	<---	SumofDEATHS2015	.610	.416	1.466	.143	
SumofPOPESTIMATE2015	<---	SumofPOPESTIMATE2014	.932	.000	11913.509	***	

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
SumofPOPESTIMATE2015	<---	SumofBIRTHS2015	.076
SumofPOPESTIMATE2015	<---	SumofDEATHS2015	.005
SumofPOPESTIMATE2015	<---	SumofPOPESTIMATE2014	.997

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
SumofBIRTHS2015	<-->	SumofDEATHS2015	1759617581410.220	329649620174.948	5.338	***	

Correlations: (Group number 1 - Default model)

			Estimate
SumofBIRTHS2015	<-->	SumofDEATHS2015	1.000

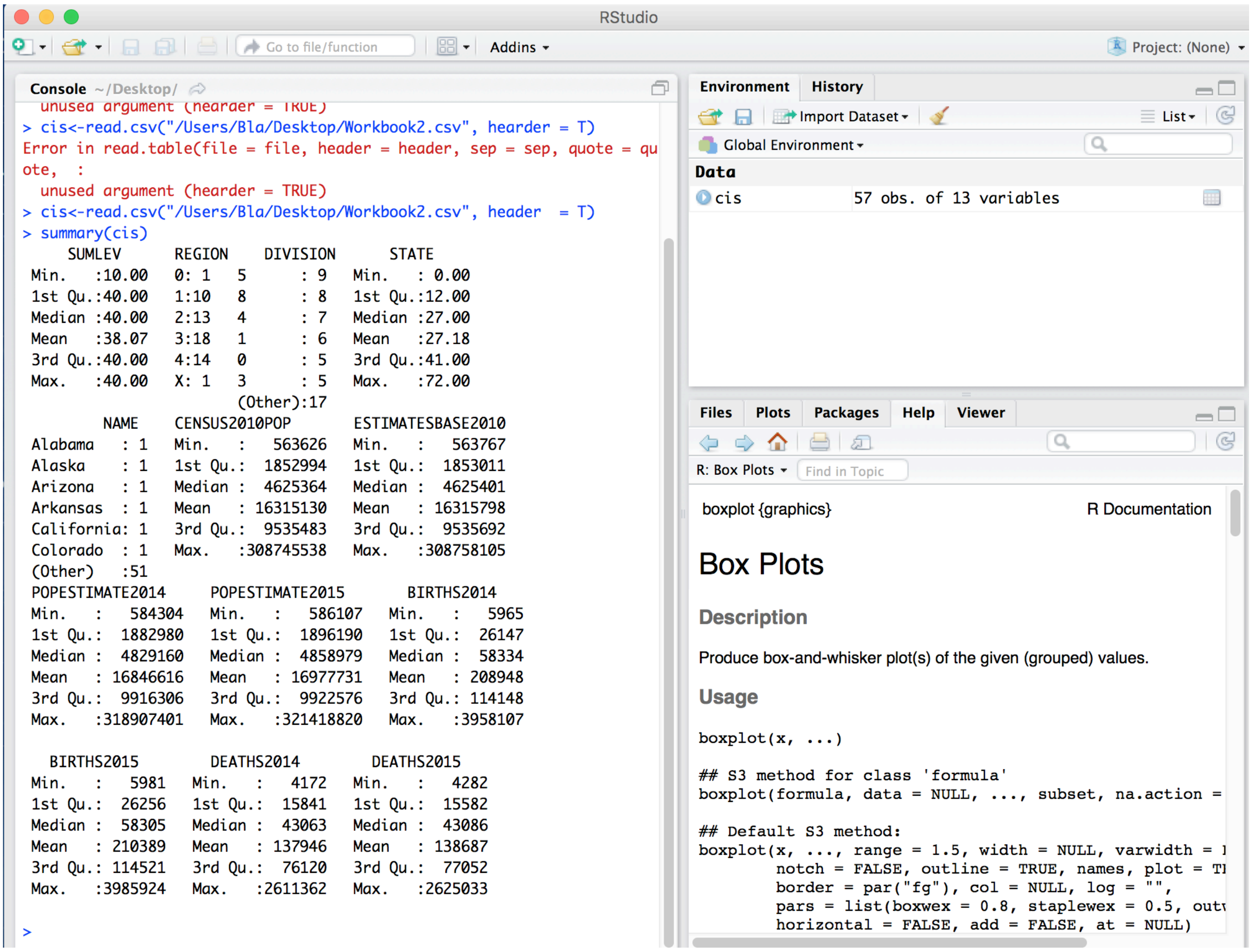
Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
SumofBIRTHS2015	2671438197891.160	500406223333.372	5.339	***	
SumofDEATHS2015	1159626922476.150	217218024811.456	5.339	***	
SumofPOPESTIMATE2014	17117165643465700.000	3206338895022470.000	5.339	***	
e1	5973604448.735	1118958633.953	5.339	***	

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
SumofPOPESTIMATE2015	1.000

The next step which is the final step. I am going to insert my data into R and do the summary and show a head of my data.



```
  unused argument (hearder = TRUE)
> cis<-read.csv("/Users/Bla/Desktop/Workbook2.csv", hearder = T)
Error in read.table(file = file, header = header, sep = sep, quote = qu
ote,  :
  unused argument (hearder = TRUE)
> cis<-read.csv("/Users/Bla/Desktop/Workbook2.csv", header  = T)
> summary(cis)
     SUMLEV        REGION    DIVISION        STATE      
 Min.   :10.00   0: 1    5       : 9   Min.   : 0.00  
 1st Qu.:40.00   1:10    8       : 8   1st Qu.:12.00  
 Median :40.00   2:13    4       : 7   Median :27.00  
 Mean   :38.07   3:18    1       : 6   Mean   :27.18  
 3rd Qu.:40.00   4:14    0       : 5   3rd Qu.:41.00  
 Max.   :40.00   X: 1    3       : 5   Max.   :72.00  
                         (Other):17                   
         NAME     CENSUS2010POP       ESTIMATESBASE2010  
 Alabama    : 1   Min.   :   563626   Min.   :   563767  
 Alaska     : 1   1st Qu.:  1852994   1st Qu.:  1853011  
 Arizona    : 1   Median :  4625364   Median :  4625401  
 Arkansas   : 1   Mean   : 16315130   Mean   : 16315798  
 California: 1   3rd Qu.:  9535483   3rd Qu.:  9535692  
 Colorado   : 1   Max.   :308745538   Max.   :308758105  
 (Other)    :51                                          
 POPESTIMATE2014      POPESTIMATE2015        BIRTHS2014     
 Min.   :   584304   Min.   :   586107   Min.   :   5965  
 1st Qu.:  1882980   1st Qu.:  1896190   1st Qu.:  26147  
 Median :  4829160   Median :  4858979   Median :  58334  
 Mean   : 16846616   Mean   : 16977731   Mean   : 208948  
 3rd Qu.:  9916306   3rd Qu.:  9922576   3rd Qu.: 114148  
 Max.   :318907401   Max.   :321418820   Max.   :3958107  
                                                          
   BIRTHS2015         DEATHS2014         DEATHS2015     
 Min.   :   5981   Min.   :   4172   Min.   :   4282  
 1st Qu.:  26256   1st Qu.:  15841   1st Qu.:  15582  
 Median :  58305   Median :  43063   Median :  43086  
 Mean   : 210389   Mean   : 137946   Mean   : 138687  
 3rd Qu.: 114521   3rd Qu.:  76120   3rd Qu.:  77052  
 Max.   :3985924   Max.   :2611362   Max.   :2625033  

>
```

Data
cis 57 obs. of 13 variables

boxplot {graphics} R Documentation

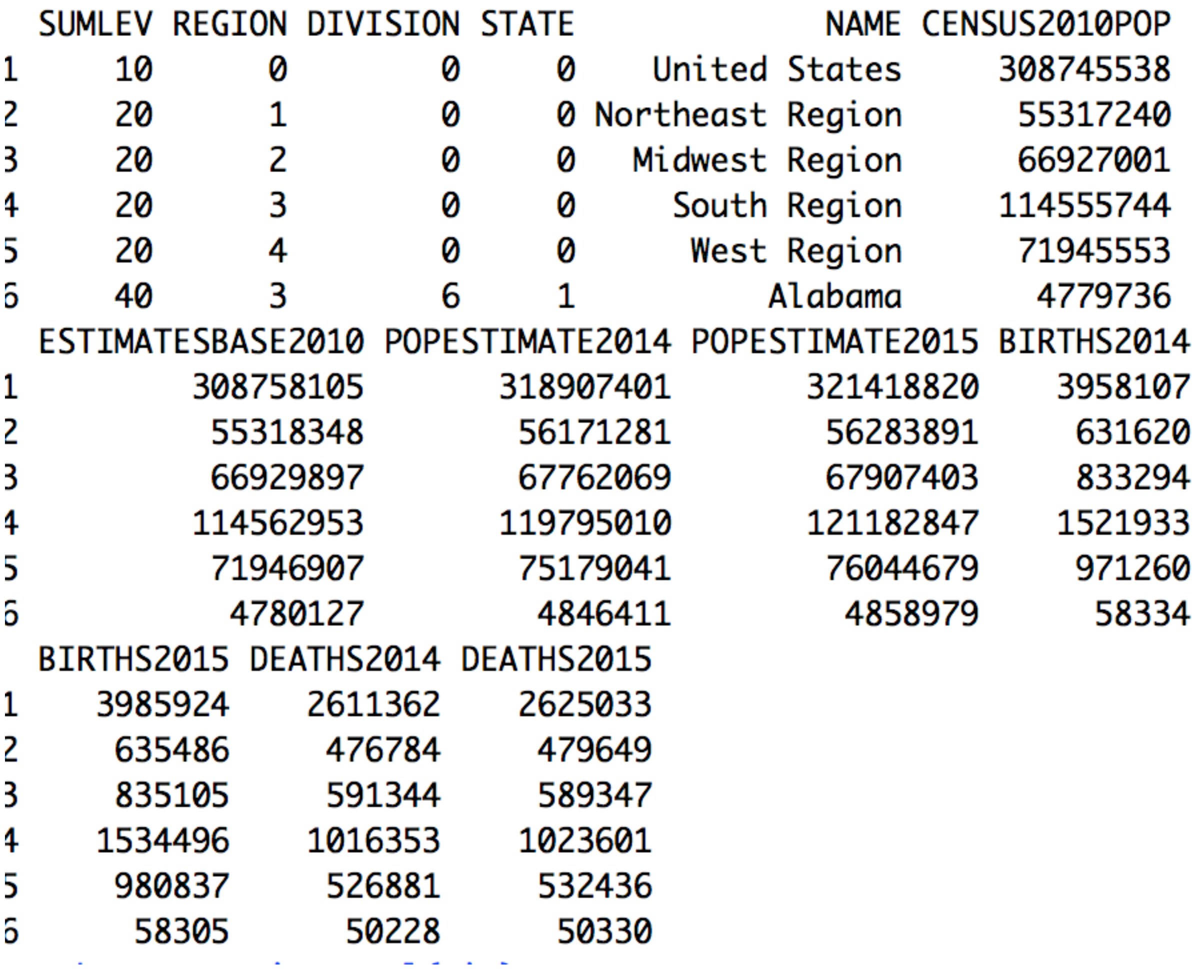
Box Plots

Description

Produce box-and-whisker plot(s) of the given (grouped) values.

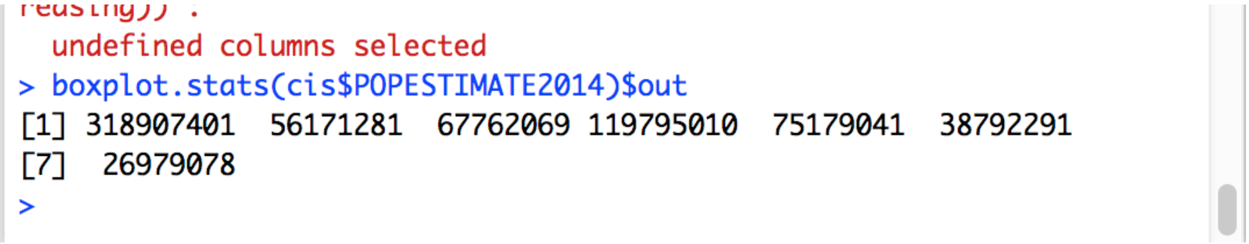
Usage

```
boxplot(x, ...)

## S3 method for class 'formula'
boxplot(formula, data = NULL, ..., subset, na.action =

## Default S3 method:
boxplot(x, ..., range = 1.5, width = NULL, varwidth = 
        notch = FALSE, outline = TRUE, names, plot = T
        border = par("fg"), col = NULL, log = "",
        pars = list(boxwex = 0.8, staplewex = 0.5, out
        horizontal = FALSE, add = FALSE, at = NULL)
```



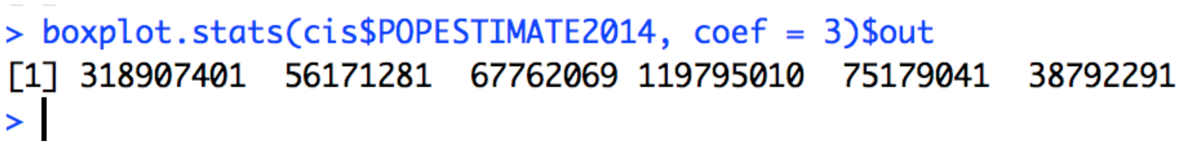
```
  SUMLEV REGION DIVISION STATE              NAME CENSUS2010POP
1     10      0        0     0     United States     308745538
2     20      1        0     0 Northeast Region      55317240
3     20      2        0     0   Midwest Region      66927001
4     20      3        0     0     South Region     114555744
5     20      4        0     0      West Region      71945553
6     40      3        6     1           Alabama       4779736
  ESTIMATESBASE2010 POPESTIMATE2014 POPESTIMATE2015 BIRTHS2014
1         308758105       318907401       321418820    3958107
2          55318348        56171281        56283891     631620
3          66929897        67762069        67907403     833294
4         114562953       119795010       121182847    1521933
5          71946907        75179041        76044679     971260
6           4780127         4846411         4858979      58334
  BIRTHS2015 DEATHS2014 DEATHS2015
1    3985924    2611362    2625033
2     635486     476784     479649
3     835105     591344     589347
4    1534496    1016353    1023601
5     980837     526881     532436
6      58305      50228      50330
```

The population estimate 2014 data. We will look for potential outliers in the data



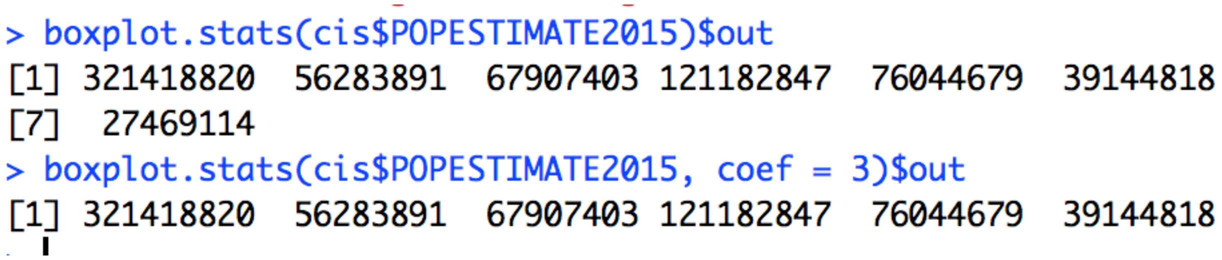
```
reasing)) :
  undefined columns selected
> boxplot.stats(cis$POPESTIMATE2014)$out
[1] 318907401  56171281  67762069 119795010  75179041  38792291
[7]  26979078
>
```

❖I may change the coef argument to 3 (it is 1.5 by default) to identify suspected outliers.



```
> boxplot.stats(cis$POPESTIMATE2014, coef = 3)$out
[1] 318907401  56171281  67762069 119795010  75179041  38792291
> 
```

❖I am going to compare the potential outliers of population estimate of year 2014 and 2015

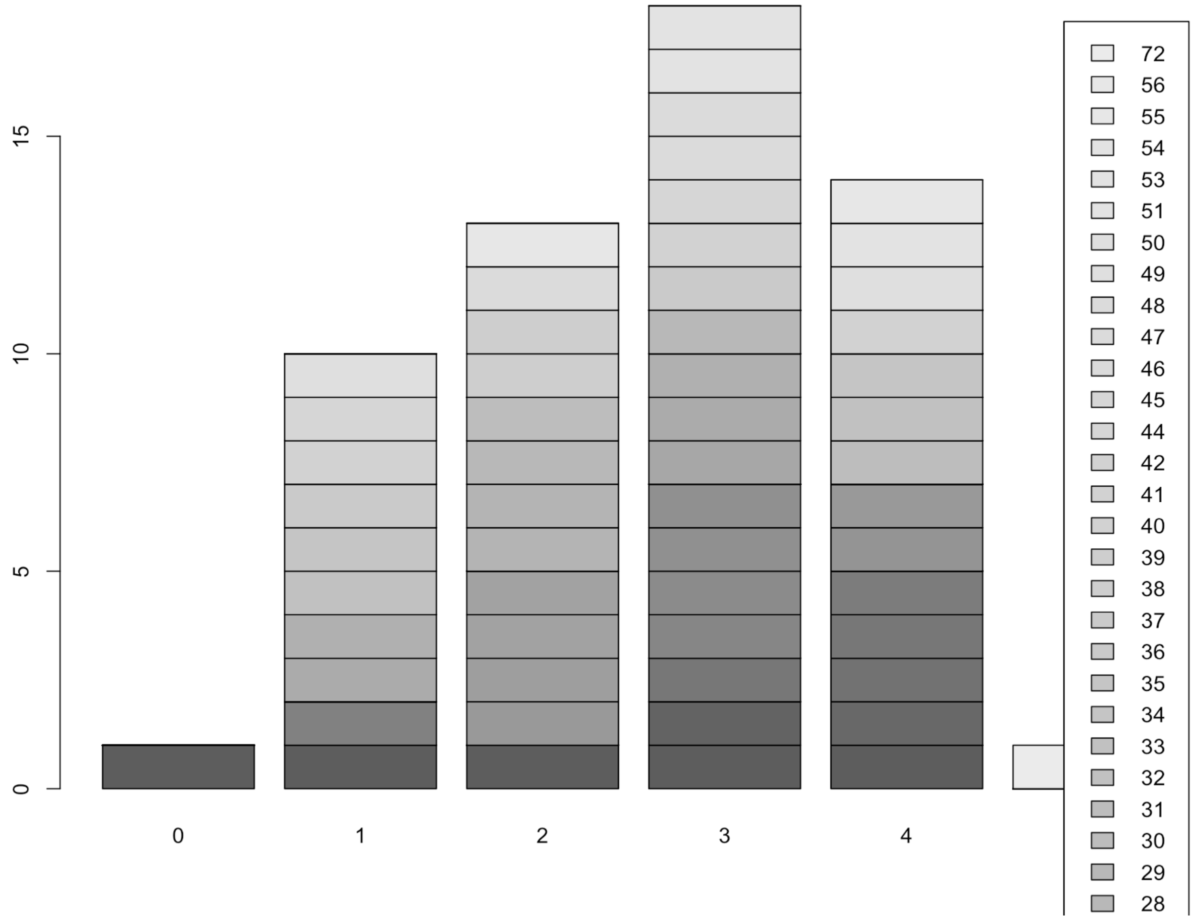


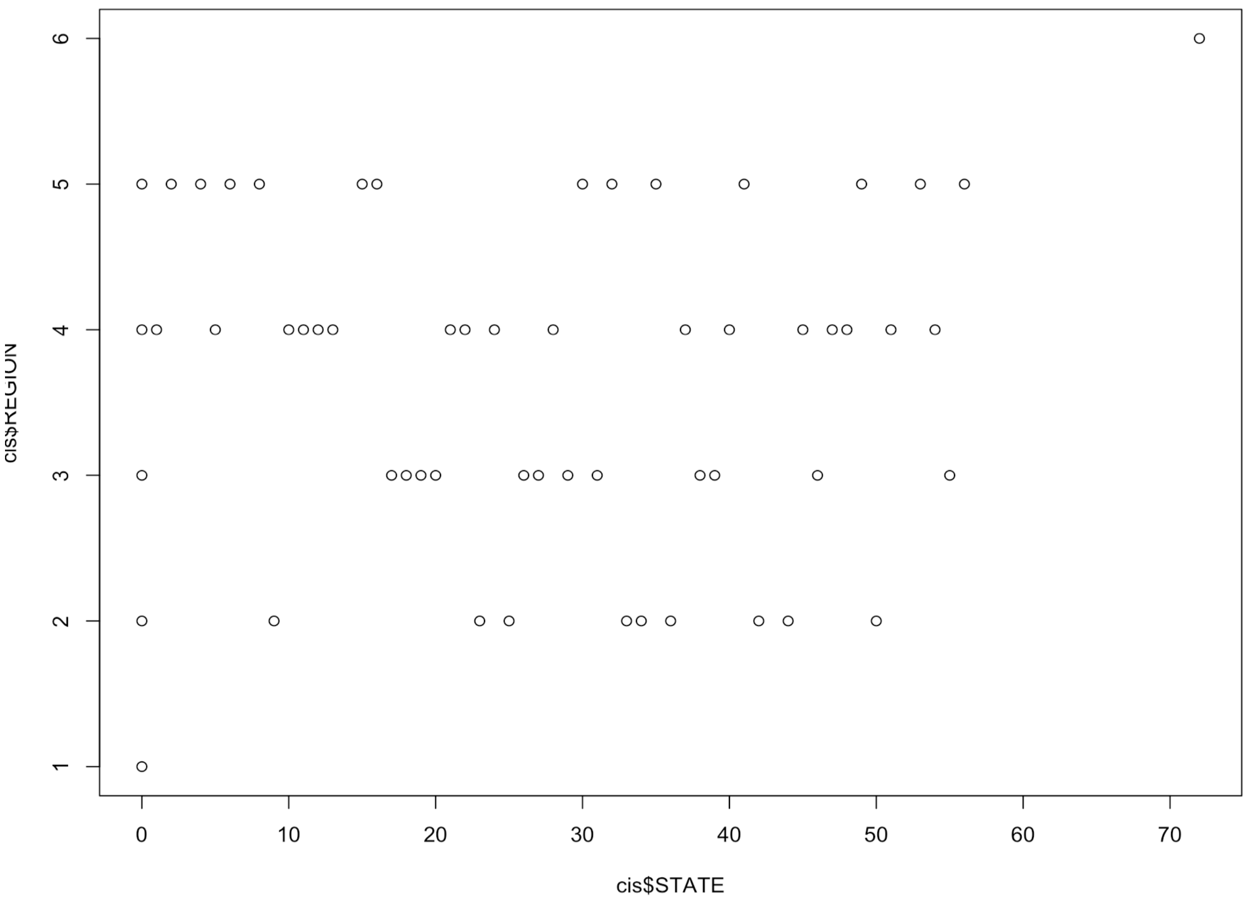
```
> boxplot.stats(cis$POPESTIMATE2015)$out
[1] 321418820  56283891  67907403 121182847  76044679  39144818
[7]  27469114
> boxplot.stats(cis$POPESTIMATE2015, coef = 3)$out
[1] 321418820  56283891  67907403 121182847  76044679  39144818
```

The plot of the different between the state of region and state of division

barplot(table(cis$STATE,cis$REGION), legend.text=TRUE)
plot(cis$STATE, cis$REGION)
The region devide by 0-1

0 is United States, 1 is Northeast Region, 2 is Midwest Region, 3 is South Region,4 is West Region





Conclusion: Back to the regression table and estimate, The births is going to increase 5.652 and the death will increase .610. Also, the population will increase as well to .932. Those numbers shows us the big different between the death and the births. The population of years 2014-2015 is increasing. Accroding to all the data that I was analysis, the population of US is increasing every year. On the other hand, the division of south is more than other. It divide in 3 colum. Across to the chart, we can see south is the higher bar. South is the place with most people living.