Where did we come from? Where might we go?

Chuck Cartledge

pril 23, 2020 at 12:02 Noon

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Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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Table of contents (1 of 1)



- 2 Data sources
 - All from the US Census Bureau



- Data manipulation
- 4 Results



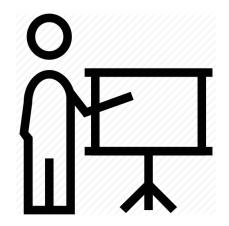
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Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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A quick overview

Questions that were/are interesting:

- What are the relative population centers
- What are the absolute population centers
- What places are changing the most

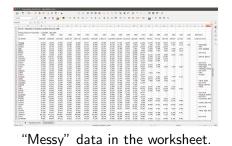


All these questions are based on time.

Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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Census data pre-2000

The file contains a lot of interesting, but not useful information. Things like: a Notes column to the right, when the state was not part of the Union, triple dashes when no data was available (because no one was there, or the county didn't exist), a textual section after the state that addresses the notes.



Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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Pi CO AL	A art III. Population of Co OPULATION OF COUNTI outly	B onties, Earli ES - ALADA	est Census	-	E	F								- Liu		· · · ·					
	art III. Population of Co OPULATION OF COUNT outly	enties, Earli ES - ALABA	est Census	-	E	F															
	OPULATION OF COUNTI outly	ES - ALABA	MA: 1800-15	to 1990			G	н	1	J	к	L	M	N	0	P	9	R	S	т	U V W
AL AL	ounty																				
м. М		1990		90																	
4	LABAMA		1980	1970	1960	1950	1940	1930	1920	1910	1900	1890	1880	1870	1860	1850	1840	1830	1820	1810	1800 Notes
4		4.040.587	3,893,888	3,444,165	3,266,740	3.061.743	2 832 961	2,646,248	2.348.174	2,138,093	1 919 607	1.513.401	1 242 525	225,222	964,201	771.623	590,756	309.527	127.901	9.046	1,250 See note 1
			3,000,000	2,444,200	3,200,140	3,001,743	1,031,971	2,040,240	2,079,217	1,120,000	2,020,007		1,101,000	100,000	201,201	1112,02.3	340,130	303,341	111,001	0,040	1,100 044 1044 1
	4044QA	34,222	32,250	24,460	18,739	18,186	20,977	19,604	18,908	20,038	17,915	13,330	13,108	11,623	16,739	15,023	14,342	11,874	3,853		
	aidwin	98,290	78,556	59,382	49,088	40.997	32,324	28,299	20,730	18,178	13,194	8,941	8,603	6.004	7.530	4,414	2,951	2,324	1,713	1,427	"Washington
	abour	25,417	24,756	22,543	24,700	28,892	32,722	32,425	32,067	32,729	35,152	34,898	33,979	29,309	30,812	21,632	12,024	-			*Pike
8		16,576	15,723	13,812	14,357	17,987	20,155	20,780	23,144 25,538	22,791 21.456	18,498	13,824 21,927	9,487	7,469	11,894	9,999	8,284	6,306	3,676		1820: Cabevte
	lourd	39,248	36,459	26,853	25,449	28,975	29,490	28,020	25,538	21,456	22,119	21,927	29,066	9,945	10,965	7,367	5,570	4,233	2,415		See rote 2
	ullock utler	21,892	21,690	22.007	24,560	29,228	32 447	30,195	29,531	29,030	25,761	21,641	19.649	14,981	18.122	10.835	8.685	5.650	1.405		SAN 11004 2
	alteun	115.004	119,761	103.092	95,878	79,539	63,319	55,611	47.822	29,030	34,874	33,035	19,049	13,980	21.529	17.163	14,200	0,000	1,400		1840-50: Benton
	hanbers	36,676	39 191	36,356	37 828	39,528	42 145	39,313	41 201	36.056	32.554	26,319	23,440	17.562	23,214	23,990	17,333	-			- Line of the state
	henkee	19,543	18,760	15,605	16,303	17.634	19,928	20,219	20.952	20,225	21.096	20.459	19,108	11.132	18,300	13,994	8,773	-			
	hiton	32,458	30.612	25,180	25,693	26.922	27.955	24,579	22,770	23,187	16,522	14,549	10,793	6.194				-			See note 3
	boctaw	16,018	16,839	16,589	17,820	19.152	20,195	29,513	20,753	18 483	18 126	17,526	15,731	12.676	13,877	8,399					"Weshington, Sum
a	larke	27,240	27,702	26,724	25,738	26,548	27.636	26.016	25,422	30,967	27,750	22,624	17,806	14,063	15.049	2,785	8.640	7.505	5.832		"Westington
a	lav	13,252	13,703	12,636	12,400	13,929	16.907	17,768	22.645	21,006	17,099	15,765	12,938	9,560							"Talladega, Rando
	leburne	12,730	12,595	10,996	10,911	11,904	13,629	12,877	13,390	13,365	13,206	13,218	10,975	8,017							See note 4
0	offee	40,240	38,533	34,872	30,583	30,720	31,987	32,556	30,070	26,119	20,972	12,170	8,119	6,171	9,623	5,940					*Dale
	olbert	51,666	54,519	49,632	46,506	39,561	34,093	29,860	31,997	24,802	22,341	20,189	16,153	12,537							*Franklin
	004530	14,054	15,884	15,645	17,762	21,776	25,439	25,429	24,593	21,433	17,514	14,594	12,605	9,574	11,311	9,322	8,197	7,444	5,713		
	9958	11,063	11,377	10,662	10,726	11,766	13,490	12,460	14,839	16,634	16,144	15,906	15,113	11,945	19,273	14,543	6,995				-
	ovington	36,478	36,850	34,079	35,631	40,373	42,417	41,356	38,103	32,124	15,346	7,536	5,639	4,868	6,409	3,645	2,435	1,522			"Henry: Bubler
	renshaw	13,635	14,110	13,188	14,909	18,981	23,631	23,656	23.017	23,313	19,668	15,425	11,726	11.156							See note 5
ä	ultrac	67,613	61,642	52,445	45,572	49,046	47,343	41,051 23,175	22,711	28,321	21,849	13,439	6,355	11 325	12 197	6.392	7.307	2 (31			"Bioset, Wriston; "Henry
	alas	49,633	53.981	55,295	56.667	56,270	55,245	55,094	54.097	53,401	54.657	49,350	48.433	40,705	33.625	29,727	25.199	14.017	6.003		many
	eKab	54,651	53,658	41,961	41.417	45.048	43.075	40.104	34,425	28,261	23,558	21,106	12,675	7.126	10,705	8,245	5.929	ANO AT	0,003		
	inces	49,210	43,390	33 535	30,524	31.649	34,546	34,290	28.085	28.245	26,099	21,732	17.502	14.477				-			See pote 6
	scambla	35,518	38.440	34,905	33,511	31,443	30.671	27.963	22,454	10.009	11.320	8.000	5,719	4.041		-	-				- "Conecult Bakhvin
	towah	99.840	103.057	94,144	96,980	93,892	72,580	63,399	47.275	39,109	27,361	21,926	15,398	10,109							See note 7
	ayette	17,962	18,809	16,252	16,148	19,388	21,651	18,443	18,355	16,248	14,132	12,823	10,135	7,136	12,850	9,681	6,942	3,547			"Tuscaloosa, Mas
	rankin	27,814	28,350	23,933	21,988	25,705	27,552	25,372	22,011	19,360	16,511	10,681	9,155	8,006	18,627	19,610	14,270	11,078	4,988		
	eneva.	23.647	24,253	21,924	22,310	25,899	29,172	30,104	29,315	26,230	19,096	10,690	4,342	2,959							*Collee, Dale; Her
	Nere	10,153	11,021	10,650	13,600	16,482	19,185	19,745	18,133	22,717	24,182	22,007	21,931	18,399	30,859	31,441	24,024	15,026	4,554		
	ale	15,498	15,604	15,888	19,537	20,832	25,533	26,265	24,289	27,883	31,011	27,501	26,553	21,792							See note 8
	enry	15,374	15,302	13,254	15,286	18,674	21,912	22,820	21,547	20,943	36,147	24,847	18,761	14,191	14,918	9,019	5,787	4,020	2,638		
	ouston	81,331	74,632	56,574	50,718	46,522	45,665	45,935	37.334	32,414											"Henry, Dale, Gen
	ackson	47,795	51,407	39,202	36,681	38,998	41,902	36,881	35,954	32,918	30,508	28,026	25,114	19,410	18,283	14,098	15,715	12,700	8,751		
	afferson	651,525	671,324	644,991	634,864	558,928	459,930	431,493	310.054	226,476	140,420	88,501	23,272	12,345	11,746	8,999	7,131	6,855			
	NTSM	15,715	16,453	14,335	14,271	16,441	19,708	18,001	18,149	17,487	16,064	14,187	12,142	8,993							See note 9
Ľ	auderdale	79,661	80,546	68,111	61,622	54,179	46,230	41,130	32,556	30,936	26,559	23,739	21,035	15,091	17,420	17,172	14,485	11,781	4,963		

"Messy" data in the worksheet.

Introduction 0	Data sources 00●000	Data manipulation 0	Results 0	Conclusion O	Files o
All from the US Cen	sus Bureau				

Census data 2000

The file has one line per county, and is column oriented (i.e., there are no delimiters between data fields).



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01001Autauga County	43671	17662	1543550050	21959029 595.968032	8.478429 32.523283	
.01003Baldwin County	140415	74285	4134518782	1115203109 1596.346694	430.582346 30.592781	
01005Barbour County	29038	12461	2291889572	50799584 884.903549	19.613830 31.856515	
01007Bibb County	28826	8345	1613627425	8124469 623.025058	3.136875 33.040054	
L01009Blount County	51024	21158	1672857889	12998871 645.585188	5.818892 33.978461	
.01011Bullock County	11714	4727	1618775183	2783863 625.012619	1.843659 32.098285	
L01013Butler County	21399	9957	2812876972	2732138 776.867295	1.854881 31.735884	-86.662232
L01015Calhoun County	112249	51322	1575987564	9996496 688.461338	3.859669 33.741989	
.01017Chambers County	36583	16256	1546657021	15382288 597.167640	5.939135 32.891233	
L01019Cherokee County	23988	14025	1432576264	121298944 553.120811	46.838697 34.184158	
L01021Chilton County	39593	17651	1797396705	17552968 693.978777	6.777239 32.852554	
L01023Choctaw County	15922	7839	2365990097	18999051 913.513922	7.335575 32.027681	
L01025Clarke County	27867	12631	3207377186	36596298 1238.375308	14.129910 31.688155	
L01027Clay County	14254	6612	1567134311	2403035 605.073966	0.927817 33.265810	
L01029Cleburne County	14123	6189	1450940300	2089814 560.211206	0.806882 33.647948	
L01031Coffee County	43615	19837	1758576346	3854683 678.990152	1.488301 31.378987	
.01033Colbert County	54984	24980	1539831753	75305160 594.532389	29.075486 34.731480	
.01035Conecuh County	14689	7265	2283546316	4436364 850.794025	1.712898 31.415613	
01037Coosa County	12202	6142	1689828597	36839382 652.443488	13.914884 32.955511	
.81839Covington County	37631	18578	2677571159	26828615 1833.816848	10.846616 31.251036	
.01841Crenshaw County	13665	6644	1578885448	3354388 609.580217	1.295137 31.710365	
81843Cullman County	77483	35233	1912519740	42457211 738.428031	16.392822 34.155603	
.0104SDale County	49129	21779	1453174585	4146478 561.073837	1.688961 31.394100	
.01047Dallas County	46365	28458	2540033739	32793461 980.712551	12.661627 32.379942	
.01049DeKalb County	64452	28051	2814784830	1988435 777.912805	0.736851 34.459133	
.01051Elmore County	65874	25733	1689844562	93127438 621.255605	35.956706 32.596847	
L01053Escambia County	38440	16544	2453710209	14424173 947.382848	5.569205 31.104135	
L01055Etowah County	103459	45959	1385183532	36080591 534.822374	13.930795 34.018597	
L01057Fayette County	18495	8472	1625632174	4354945 627.660118	1.681454 33.747077	
.01059Franklin County	31223	13749	1646312169	28139961 635.644709	10.864900 34.465405	
.01061Geneva County	25764	12115	1492559453	6793742 576.280451	2.623079 31.094579	
01063Greene County	9974	5117	1672782673	36438381 645.865028	14.068907 32.837254	
01065Hale County	17185	7756	1667267384	32984565 643.735532	12.735412 32.768094	
81867Henry County	16310	8037	1455845371	16913484 561.796182	6.538333 31.493511	
81869Houston County	88787	39571	1583124582	3351697 588.359678	1.294898 31.189731	
.01071Jackson County	53926	24168	2793932865	124376317 1078.743247	48.821967 34.755318	
.01073Jefferson County	662847	288162	2881639146	28998564 1112.607142	11.196409 33.527872	
01075Lamar County	15984	7517	1566546589	1688546 684.847845	0.617974 33.772995	
.01077Lauderdale County	87966	46424	1733895504	127745468 669.460825	49.322808 34.876890	
.01079Lawrence County	34803	15009	1795852273	63932890 693.382469	24.684628 34.554375	
01001Lee County	115092	50329	1576552257	17723094 608.710255	6.842925 32.607485	
01003Limestone County	65676	26897	1471241120	101090592 568.049396	39.031297 34.807445	
01085Lowndes County	13473	5801	1859446869	18376863 717.936480	7.095347 32.171280	
01087Macon County	24105	10627	1581247720	7042123 610.523184	2.718979 32.421555	
01089Madison County	276700	120288	2884739505	20532503 804.922458	7.927644 34.730790	
01091Marengo County	22539	10127	2538533978	15034262 977.044670	5.884761 32.331745	
81893Marion County	31214 82231	14416	1928255331	5586855 741.414760 145383458 567.659769	2.156788 34.116331	
.01895Marshall County .01897Mobile County	82231 399843	36331 165101	1468677998 3193698623	145383458 567.859769 1864388786 1233.898896	56.181981 34.329598 418.931986 38.722256	
	24324	165181	3193698623	22457598 1025.854799	418.931986 38.722256 8.678924 31.555656	
L01099Monroe County L01101Montgomery County	223510	95437	2845477293	25888189 789 763232	9,992397 32,331872	

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Census data 2010

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Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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AL	01001	00161526	Autauga County	54571	22135	1539582278	25775735	594.436		9.952	32.536382	-86.644490	
AL	01003	00161527	Baldwin County	182265	104061	4117521611	1133190229	1589.784		437.527	30.659218	-87.746067	
AL	01005	00161528		27457	11829	2291818968	50864716	884.876		19.639	31.878678	-85.405456	
AL	81887	00161529	Bibb County	22915	8981	1612488789	9289057	622.582	3.587	33.01		127148	
AL	81889	00161530	Blount County	57322	23887	1669961855	15157440	644.776		5.852	33.977448	-86.567246	•
AL	81811	00161531		18914	4493	1613856985	6056528	622.885	2.338			717261	,
AL	81813	00161532	Butler County	28947	9964	2011976894	2726814	776.829	1.853			681969	,
AL AL	81815	00161533 00161534	Calhoun County Chambers County		53289 17004	1569189995 1545889282	16624267 17048142	605.868 596.531		6.419	33.771786 32.917943	-85.822513 -85.391812	•
AL	81817 81819	00101534	Chambers County Cherokee County		1/004	1545889282	17048142 119858898	596.531 553.700		6.58Z 46.278	32.917943 34.069515	-85.391812	
AL	01019	00101535	Chilton County		19278	1794483586	20586383	692.854		7.948	32,854059	-86.726627	
AL	01023	00161537	Choctaw County		7269	2365954748	19059251	913.500		7.359	31,991008	-88,248887	
AL	01025	00161538	Clarke County	25833	12638	3207609488	36542656	1238.465		14.109	31.685521	-87.818624	
AL	01027	00161539	Clay County	13932	6776	1564252280	5284628	603.961	2.040	33.26		862051	
AL	01029	00161540	Cleburne County		6718	1450052707	2365681	560.100	0.913	33.67		516109	
AL	01031	00161541	Coffee County	49948	22330	1758528786	3944730	678.972	1.523	31,40		989201	
AL	01033	00161542	Colbert County	54428	25758	1534877333	76430813	592,619		29,510	34,783112	-87.801457	
AL	01035	00161543	Conecuh County	13228	7093	2201894769	6644940	858,156	2,566	31.42	-86.	992829	
AL	81837	00161544	Coosa County	11539	6478	1685891875	39946646	650.926		15.423	32.931445	-86.243482	,
AL	81839	00161545	Covington Count		37765	18829 266			1038.456			43987 -86.44	
AL	81841	00161546	Crenshaw County		6735	15768888866	5376392	688.848	2.876	31.73		319222	,
AL	81843	00161547	Cullman County		37854	1903228333	52266921	734.841		28.188	34.131923	-86.869267	•
AL	81845	00161548	Dale County	58251	22677	1453371157	4016457	561.150	1.551	31.43		689476	•
AL	81847	00161549	Dallas County	43828	20208	2534887386	39134826	978.695		15.110	32.333540	-87.114356	•
AL	01049	00161550	DeKalb County	71189	31109	2012662359	4123588	777.093	1.592			803992	•
AL	01051	00161551	Elmore County	79303	32657	1601867593	99862541	618.485		38.557	32.597229	-86.142738	•
AL	01053	00161552	Escambia County		16486	2447746932	20873208	945.080		8.059	31.121747	-87.168429	•
AL	01055	00161553	Etowah County	104430	47454	1385618994	35322991	534.991		13.638	34.047638	-86.034420	
AL AL	01057	00161554	Fayette County		8437 14022	1625631609	4392821 32897905	627.660	1.696	33.73	2249 -87. 34.441988	752049	
AL	01059	00101555	Geneva County	26798	12687	1487718425	32897905	574,408		4,543	31.090866	-87.842815	:
AL	01001	00101550	Greene County	20790	5007	1487710425	33231212	647.110		12,831	31.090800	-85.824340	:
AL	81865	00161558	Hale County	15768	7655	1667883914	32525967	643.943		12.558	32.752796	-87.623861	
AL	81867	00161559	Henry County	17382	8891	1454926258	16986789	561.750		6.559	31,516978	-85,239971	
AL	81869	00161560		181547	45319	1501737720	4739984	579.824	1.838			296398	
AL	81871	00161561	Jackson County		24786	2791664869	126657194	1077.868		48,983	34.763522	:85.977488	•
AL	01073	00161562	Jefferson Count		658466	300552 287	8192209 324		1111.276			53444 -86,89	
AL	01075	00161563	Lanar County	14564	7354	1566544654	1600679	684,846	0,618	33.78	7085 -88.	087431	•
AL	01077	00161564	Lauderdale Coun	tv	92709	43791 172	9327931 138	027479	667.697		53.293 34.5	04122 -87.65	8997 +
AL	01079	00161565	Lawrence County		15229	1788846568	68688464	690.678		26.521	34.529776	-87.321865	•
AL	01081	00161566	Lee County		62391	1573510728	21530362	607.536		8.313	32.684864	-85.353048	•
AL	01083	00161567	Limestone Count		82782	34977 149		381869	559.936			10239 -86.98	1399 +
AL	01085	00161568	Lowndes County		5140	1854199648	23723525	715.911		9.160	32.147888	-86.650586	•
AL	01087	00161569	Macon County	21452	10259	1577005015	11194263	608.885		4.322	32.387027	-85.692887	•
AL.	01089	00161570		334811	146447	2076116529	28771340	801.593		11.109	34.764238	-86.551080	•
AL.	81891	00161572		21827	10237	2530112461	14994547	976.882		5.789	32.247591	-87.791691	•
AL	81893	00161573	Marion County	38776	14737	1922526826	3313145	742.292	1.279			881551	•
AL AL	81895	00161574 00161575	Marshall County	93819 412992	48342 178196	1465522757 3184223882	148503356 1073750500	565.842 1229.435		57.337 414.577	34.389564 30.684573	-86.321668 -88.196568	:
AL	81897	00101575	Mobile County Monroe County	412992 23868	178196	3184223882 2656485275	22643193	1229.435		414.577	30.084573	-88.190508	
		ties national.tx		23868 Text pai		2030485275	22043193	1025.075		0.743	31.368332	107.383200	,
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Truncate long lines enabled

Sometimes tabs are treated "funny" by the browser.

Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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Only the simplest of manipulations

- Data was "wrangled" and stored in a Postgres database
- 2 Each row in the database had:
 - County centroid (latitude and longitude)
 - Year (1790 to 2010 by 10, even for those counties and states that didn't exist)
 - Opulation (0 for those that don't exist)
- Ourrent names used, even when census was taken using old names

Performance could be improved using a data frame vice database. Performance not bad.

Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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Static images don't do the question justice

- Click on the GIFs in the Files section
- Each image has latitude, longitude, and a Z component
- The Z component varies based on the type of image



Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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What have we covered?

- Population and geographic data available from US Census Bureau
- Lots of long term demographic data is available
- Counties change over time
- Lots of interesting questions could be asked and answered

IS THIS

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Next time: see where the wind blows

Introduction	Data sources	Data manipulation	Results	Conclusion	Files
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Files of interest

- pop.gif percentage population growth by county 1790 - 2010 viewRGL.F 2 pop.gif - normalized population by county 1790 - 2010 op.gif - absolute population viewRGL.R growth by county 1790 - 2010 viewRGL.R - an R script to view RGL data of the last year in the gif
 - o rglData.dat an R data file with normalized data to be viewed with
 - rglData.dat an R data file with raw data to be viewed with
 - rglData.dat an R data file with

growth data to be viewed with

viewRGL.