

# Unemployment Status of the Civilian Population

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## Overview:

Discovering the correlation and patterns among race, sex, and age in unemployment data

- Use unemployment data that is provided by Bureau of Labor Statistics

### Change Output Options

Data extracted on: December 2, 2013 (3:18:14 PM)

## Labor Force Statistics from the Current Population Survey

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Series Id:          LNU03000003
Not Seasonally Adjusted
Series title:       (Unadj) Unemployment Level - White
Labor force status: Unemployed
Type of data:       Number in thousands
Age:                16 years and over
Race:               White

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2003	6978	6572	6572	6138	6119	6822	6635	6364	5994
2004	6751	6502	6533	5780	5654	6257	5926	5659	5333
2005	6023	6105	6664	5184	5142	5422	5421	5144	5194
2006	5605	5572	5149	4803	4774	5235	5295	5096	4688
2007	5714	5519	4953	4713	4657	5276	5486	5243	5089
2008	6072	5966	5853	5258	5812	6483	6807	6862	6559
2009	9779	10346	10602	9729	10398	11214	11209	11118	10815
2010	11952	12079	11611	10760	10575	10979	10969	10769	10373
2011	10942	10782	10229	9542	9618	10310	10309	9878	9545
2012	9874	9755	9301	8684	8882	9344	9493	9853	8374
2013	9415	8887	8454	7817	8009	8495	8486	7903	7505

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Series Id:          LNU04000003
Not Seasonally Adjusted
Series title:       (Unadj) Unemployment Rate - White
Labor force status: Unemployment rate
Type of data:      Percent or rate
Age:               16 years and over
Race:              White
```

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	5.8	5.6	5.6	5.5	5.1	5.1	5.6	5.5	5.3	5.0	4.7	4.9
2004	5.6	5.4	5.4	4.8	4.7	5.1	4.8	4.7	4.4	4.3	4.4	4.4
2005	5.0	5.0	4.7	4.3	4.2	4.4	4.4	4.2	4.2	4.1	4.0	4.0
2006	4.6	4.5	4.2	3.9	3.9	4.2	4.2	4.1	3.8	3.6	3.7	3.8
2007	4.6	4.4	4.0	3.8	3.7	4.2	4.3	4.2	4.1	3.8	3.9	4.3
2008	4.9	4.8	4.7	4.2	4.6	5.1	5.4	5.4	5.2	5.5	5.8	5.8
2009	7.8	8.2	8.5	7.8	8.3	8.8	8.8	8.8	8.6	8.7	8.6	8.6
2010	9.6	9.7	9.3	8.6	8.5	8.7	8.7	8.6	8.3	8.1	8.4	8.3
2011	8.8	8.7	8.3	7.7	7.7	8.2	8.2	7.9	7.6	7.6	7.2	7.2
2012	8.0	7.9	7.5	7.7	7.2	7.5	7.6	7.2	6.8	6.6	6.4	6.6
2013	7.6	7.2	6.9	6.4	6.5	6.8	6.8	6.4	6.1	6.0		

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
2003	3752	3558	3412	3168	2982	3147	3079	2979	2759	2719	2888	2975	31255
2004	3483	3137	3277	2833	2741	2707	2476	2499	2390	2376	2522	2645	27885
2005	3299	3091	3094	2928	2855	2206	2168	2169	2127	2170	2223	2470	24565
2006	2900	2791	2793	2657	2600	2149	2149	2149	2149	2149	2149	2149	21490
2007	2927	2910	2515	2247	2149	2176	2302	2061	2292	2194	2245	2674	24080
2008	3078	3075	3078	2627	2744	2753	2956	3046	3245	3134	3686	4495	31790
2009	3431	3827	6036	5411	5699	5699	5602	5610	5730	5738	5840	6217	57460
2010	6648	6945	6756	6588	6741	5369	5381	5321	5139	5583	5696	5628	56280
2011	6668	6668	5035	5035	5035	5035	5035	5035	5035	5035	5035	5035	50350
2012	5115	5005	4080	4237	4331	4356	4208	4068	3992	3941	3894	4148	42347
2013	4919	4995	4280	3922	3969	3982	3911	3781	3667	3669			

Series Id:

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2003	6.1	5.7	5.5	5.1	4.8	5.0	4.9	4.8	4.4	4.3	4.8	4.7	5.0
2004	5.6	5.4	5.4	4.5	4.4	4.3	3.9	3.9	3.8	3.8	4.0	4.2	4.4

2008	4.7	4.
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2010	8.3	9.0	9.3	8.3	8.7	8.7	8.3	8.8	8.7	8.8	9.0	9.0	8.8
2010	10.7	10.7	10.1	9.1	8.4	8.4	8.2	8.2	8.1	8.0	8.6	8.8	8.9
2011	9.2	9.1	8.7	7.8	7.6	7.7	7.4	7.1	7.1	7.2	6.8	7.3	7.7
2012	8.0	7.9	7.5	6.6	6.7	6.7	6.5	6.3	6.2	6.1	6.0	6.4	6.7
2013	7.6	7.1	6.7	6.2	6.1	6.0	6.0	5.8	5.7	5.7			

Series Id:

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Not seasonally adjusted
Series title:      (Unadj) Unemployment Level - 20 yrs. & over, White Women
Labor force status: Unemployed
Type of data:      Number in thousands
Age:               20 years and over
Race:              White
Sex:               Women

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2003	2295	2265	2284	2137	2245	2355	2461	2525	2388	2193	2128	2040	2212
2004	2406	2230	2335	2077	2206	2393	2377	2280	2132	1996	2002	1834	2121
2005	2128	2094	1954	1981	1947	2117	2277	2145	2180	2074	1946	1810	2018
2006	2052	2010	1846	1856	1794	1799	2205	2094	2036	1800	1813	1635	1919
2007	2035	1840	1736	1765	1700	1651	2232	2100	2008	1878	1803	1648	1891

Series Id: LNU03000029  
Not Seasonally Adjusted  
Series title: (Unadj) Unemployment Level - 20 yrs. & over, White Women  
Labor force status: Unemployed  
Type of data: Number in thousands  
Age: 20 years and over  
Race: White

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2003	2295	2265	2284	2317	2245	2355	2461	2525	2388	2193	2128	2040	2276
2004	2496	2320	2335	2376	2390	2397	2280	2132	1996	2002	1834	1834	2172
2005	2525	2510	2536	2517	2517	2517	2517	2517	2517	2517	2517	2517	2517
2006	2055	2032	1846	1856	1794	1799	2205	2094	2036	1801	1813	1635	1927
2007	2025	1840	1726	1766	1700	1961	2223	2190	2008	1878	1891	1948	1990
2008	2113	2094	1808	1907	2071	2376	2549	2861	2388	2610	2677	2833	2384
2009	3388	3441	3535	3341	3573	3910	4157	4027	3951	3928	3831	3707	3745
2010	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917
2011	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917	3917
2012	3800	3772	3571	3502	3533	3667	4026	3766	3464	3333	3180	3191	3564
2013	3562	3311	3214	2926	3201	3346	4010	3178	3041	2875			

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Not seasonally adjusted
Series title:      (Unadj) Unemployment Rate - 20 yrs. & over, White Women
Labor force status: Unemployment rate
Type of data:      Percent or rate
Age:               20 years and over
Race:              White
Sex:               Women

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Year	Jan	Fel
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2003	4.4	4.3	4.1	4.3	4.3	4.8	4.9	4.6	4.2	4.1	3.9	4.4
2004	4.6	4.3	4.0	3.8	4.6	4.6	4.4	4.1	3.8	3.8	3.5	4.2
2005	4.0	4.0	3.7	3.8	3.7	4.3	4.1	3.8	3.8	3.7	3.4	4.0
2006	3.9	3.8	4.4	3.5	4.4	3.1	3.8	3.8	3.3	3.4	3.0	3.6
2007	3.8	3.4	3.2	3.3	3.2	3.7	4.1	4.1	3.7	3.5	3.6	3.6
2008	3.9	3.9	3.9	3.5	3.8	4.4	4.7	5.3	4.4	4.7	4.9	5.1
2009	6.2	6.2	6.4	6.1	6.5	7.1	7.6	7.7	7.2	7.1	6.9	6.8
2010	7.1	7.4	7.2	6.9	7.0	7.3	7.7	7.7	7.2	7.1	7.2	7.2
2011	7.2	7.2	6.8	6.6	6.9	7.3	7.6	7.6	7.2	6.8	6.5	6.3
2012	7.0	6.9	6.5	6.4	6.5	6.8	7.4	6.9	6.3	6.1	5.8	6.5
2013	6.6	6.1	5.9	5.4	5.6	6.2	6.3	5.9	5.5	5.3		

Series Id:

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Not seasonally adjusted
Series title:      (Unadj) Unemployment Level - 16-19 yrs., White
Labor force status: Unemployed
Type of data:      Number in thousands
Age:               16 to 19 years

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Year	930	939	975	992	1319	1115	960	761	817	790	909
2003	862	900	822	851	907	1157	1074	880	809	818	801
2005	815	934	715	834	899	1120	956	812	739	758	791
2006	763	710	775	674	757	1117	936	863	768	715	704
2007	761	769	712	699	807	1139	943	793	788	731	812
2008	864	796	667	723	996	1332	1304	954	926	939	973
2009	1060	1064	1010	937	1126	1065	1450	1300	1156	1183	1088
2010	1080	1078	1081	1031	1223	1486	1376	1184	1071	1076	938

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Series Id: LNU03000015
Not Seasonally Adjusted
Series title: (Unadj) Unemployment Level - 16-19 yrs., White
Labor force status: Unemployed
Type of data: Number in thousands
Age: 16 to 19 years
Race: White
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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2003	920	929	876	832	892	1319	1115	860	848	761	815	736	9909
2004	862	890	822	851	897	1157	1074	888	809	862	818	801	8980
2005	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2006	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2007	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2008	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2009	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2010	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2011	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2012	862	869	822	851	897	1157	1074	888	809	862	818	801	8980
2013	862	869	822	851	897	1157	1074	888	809	862	818	801	8980

Series Id:  
MS-A-90678

```

Series title:      (Unadj) Unemployment Rate - 16-19 yrs., White
Labor force status: Unemployment rate
Type of data:      Percent or rate
Age:               16 to 19 years
Race:              White

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2003	36.3	36.3	15.7	14.8	15.4	18.8	15.6	13.2	15.0	13.4	14.2	15.2
2004	15.5	16.2	15.1	15.2	15.7	17.1	14.9	13.5	14.4	14.0	14.3	15.0
2005	14.9	16.8	14.7	15.0	15.6	16.3	13.4	12.3	12.9	13.3	13.8	11.8
2006	13.7	13.9	12.8	12.1	13.1	15.8	12.8	12.8	13.5	12.6	13.0	12.1
2007	13.7	14.1	13.1	13.0	14.5	16.6	13.4	12.9	14.0	13.2	14.7	13.1
2008	16.4	15.3	12.9	13.4	17.3	19.7	18.7	15.6	17.2	17.6	18.6	16.8
2009	19.2	20.5	19.9	18.9	21.1	25.0	22.2	22.4	23.6	23.0	21.6	21.8
2010	24.1	23.6	23.3	21.9	25.1	26.4	23.2	22.1	23.1	23.4	20.8	20.7
2011	23.5	21.9	20.9	20.7	22.6	23.8	23.3	21.5	20.9	21.9	21.0	21.3
2012	22.1	21.8	22.2	21.2	23.1	24.5	21.7	22.0	20.8	20.6	19.4	19.6
2013	22.1	21.9	20.9	20.7	22.6	23.8	23.3	21.5	20.9	21.9	21.0	21.3

Series Id:

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Not Seasonally Adjusted
Series title:      (Unadj) Unemployment Level - Black or African
Labor force status: Unemployed
Type of data:      Number in thousands
Age:               16 years and over
Race:              Black or African American

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Year	Jan	Feb
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2003	1774	1803	1730	1691	1742	2023	2008	1832	1761	1814	1671	1949
2004	1765	1624	1738	1518	1577	1782	2047	1766	1649	1756	1784	1739
2005	1818	1850	1756	1633	1639	1874	1786	1679	1539	1512	1802	1514
2006	1532	1644	1623	1517	1452	1634	1864	1533	1511	1420	1469	1393
2007	1435	1412	1439	1356	1400	1589	1588	1352	1304	1435	1454	1499
2008	1645	1465	1591	1447	1661	1760	1965	1925	1989	1952	1979	2071
2009	2355	2462	2355	2551	2603	2737	2867	2653	2665	2675	2667	2725
2010	3059	2847	2957	2848	2738	2803	3007	2939	2826	2715	2772	2751
2011	2938	2740	2740	2799	2838	2972	3004	3072	2865	2576	2664	2739
2012	2631	2658	2610	2608	2438	2780	2700	2881	2440	2585	2643	2616

# Data Collection

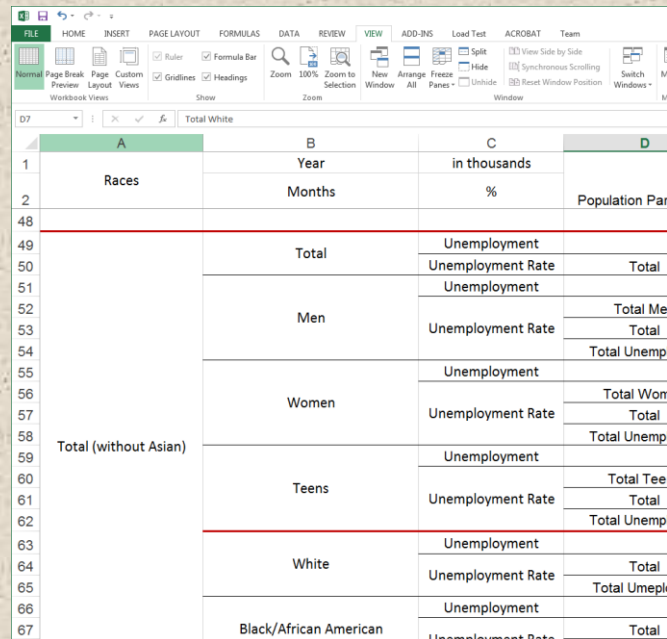
- We organized the data into one excel file to then we split the data up by categories race, sex, and age
- Also split up based on unemployment rate or unemployed number

Races										2000												2001												2002												2003												2004												2005																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		Year		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Asian		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men (20 years old and over)		Women (20 years old and over)		18 years old - 19 years old		Total		Men	

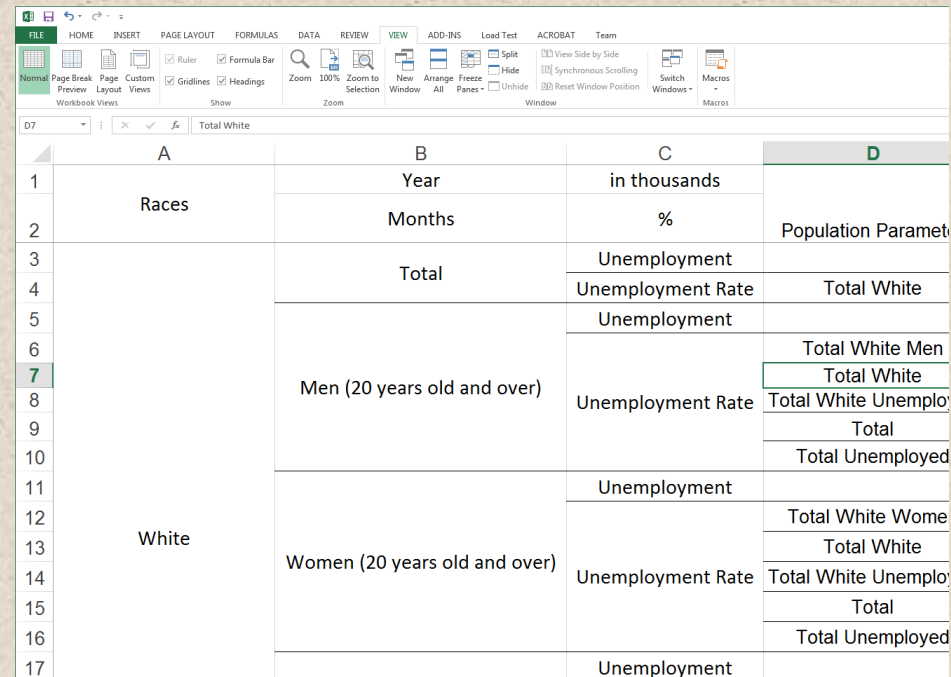


# Data Collection

- Then we bring into Matlab
- Through Matlab, we generated even more data, such as Unemployment rate with total population (unemployed + employed), total unemployed population, Total population in certain race...etc.



	A	B	C	D
1	Races	Year	in thousands	
2		Months	%	Population Par
48				
49		Total	Unemployment	Total
50			Unemployment Rate	
51			Unemployment	
52		Men	Unemployment Rate	Total Me
53				Total
54			Unemployment	Total Unempl
55			Unemployment	
56		Women	Unemployment Rate	Total Wom
57				Total
58				Total Unempl
59	Total (without Asian)		Unemployment	
60			Unemployment Rate	Total Teer
61				Total
62				Total Unempl
63			Unemployment	
64		White	Unemployment Rate	Total
65				Total Umepl
66			Unemployment	
67		Black/African American	Unemployment Rate	Total



	A	B	C	D
1	Races	Year	in thousands	
2		Months	%	Population Paramet
3				
4		Total	Unemployment	Total White
5			Unemployment Rate	
6			Unemployment	
7		Men (20 years old and over)		Total White Men
8			Unemployment Rate	Total White
9				Total White Unemplo
10				Total
11				Total Unemployed
12			Unemployment	
13	White			Total White Wome
14		Women (20 years old and over)	Unemployment Rate	Total White
15				Total White Unemplo
16				Total
17			Unemployment	Total Unemployed

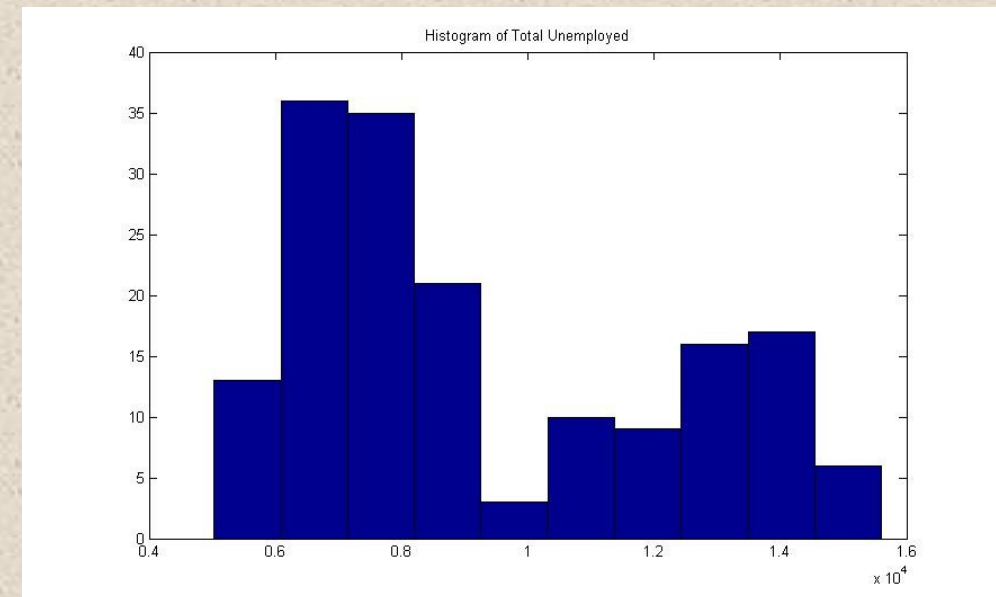
# Data collection

- After having all the useful data, we then calculated mean, SD, covariance.

GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN
Overall					Annual				
mean	variance	standard deviation	covariance	correlation coefficient	mean	variance	standard deviation	covariance	correlation coefficient
4.887952	2.119734	1.455931			4.823077	2.026391	1.423513		
2.123685	0.421469	0.649206			2.092999	0.406926	0.637908		
37.592416	5.983397	2.446098			37.477136	1.606912	1.267641		
1.860701	0.320266	0.565921	0.017389	0.015665	1.833300	0.310225	0.556979	0.017149	0.015884
29.216063	2.761522	1.661783	-0.008056	-0.002346	29.167176	0.578128	0.760347	-0.008011	-0.005923
931.500000	32820.924699	181.165462			928.307692	13396.828402	115.744669		
16.781928	17.044131	4.128454			16.546154	15.108639	3.886983		
0.757546	0.019363	0.139150			0.755188	0.007381	0.085913		
14.151468	10.533415	3.245522			14.283074	7.123627	2.669012		
0.663952	0.014755	0.121471	0.006217	0.026495	0.661527	0.005642	0.075115	0.006200	0.048251
10.982219	5.887337	2.426384	0.000125	0.000025	11.101557	3.953977	1.988461	0.000061	0.000020
1969.819277	308763.593845	555.665001			1937.000000	292662.000000	540.982440		
11.302410	8.133729	2.851969			11.176923	7.829467	2.798119		
878.313253	95395.419945	308.861490			863.538462	92560.248521	304.237158		
11.229518	12.611960	3.551332			11.115385	12.279763	3.504249		
5.031585	2.659193	1.630703			4.972520	2.584639	1.607681		
43.883490	17.858110	4.225886			43.777440	9.919632	3.149545		
0.624323	0.044538	0.211040	0.005813	0.013672	0.613205	0.042785	0.206845	0.005716	0.014105
9.718892	0.625922	0.791152	-0.007932	-0.001203	9.669576	0.221041	0.470150	-0.007953	-0.002250
830.753012	56950.969117	238.644022			814.538462	50850.710059	225.501020		

# Data Limitations

- An Education category would have been nice to do more comparisons
- More data points could help the distributions to be more normal
- The Asian categories was limited
  - It was not split up into Men, Women, and Teens
- The race categories were restricted
  - Could use a Hispanic category



# Data Analysis

- **Get mean and variance for each category**
- **Plot the distributions and find any interesting patterns**
- **Discovering the correlation among the categories**
  - We got the covariance between two categories
  - $Cov(x, y) = E[xy] - E[x]E[y]$
  - Ex.  $Cov(White, Men) = E[White Men] - E[White]E[Men]$
- **With covariance we can see if categories are independent**



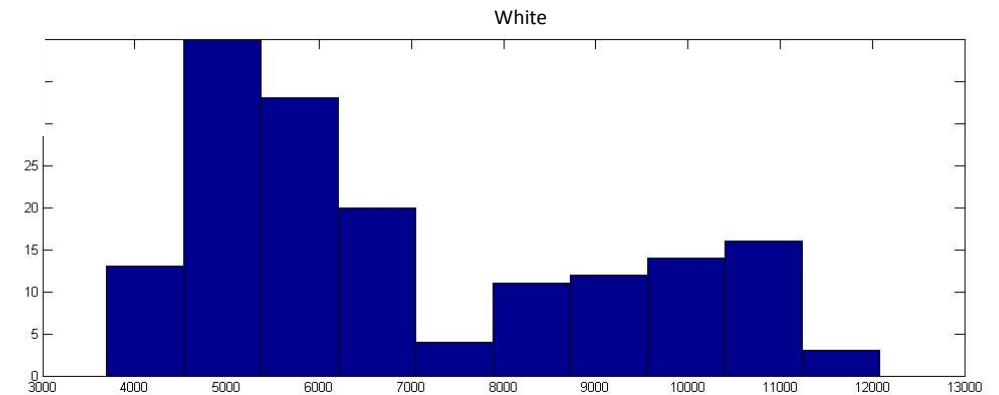
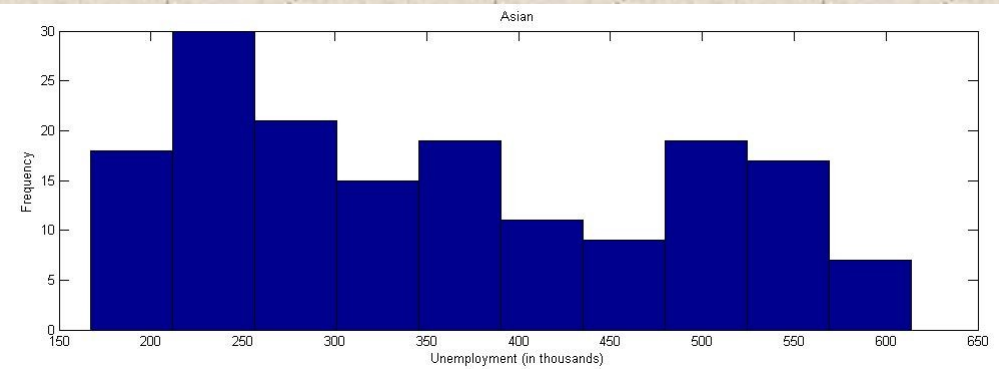
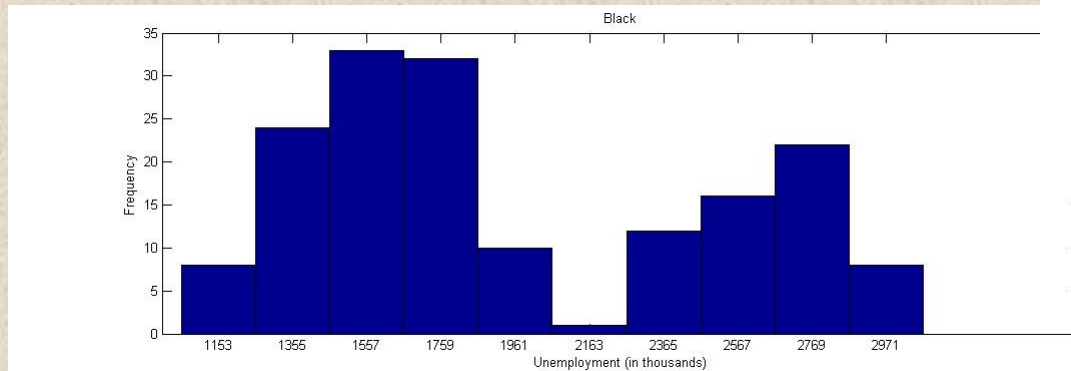
# Data Analysis

- For each category:
  - Unemployment rate = Unemployment number/ Total population
  - Total population (Unemployment + Employment) = Total unemployment / Unemployment Rate
- Do hypothesis testing on Unemployment Rate
  - Comparing two distinct populations
  - Using ML decision rule
  - Find  $p_{\text{false-alarm}}$  and  $p_{\text{miss}}$



# Results

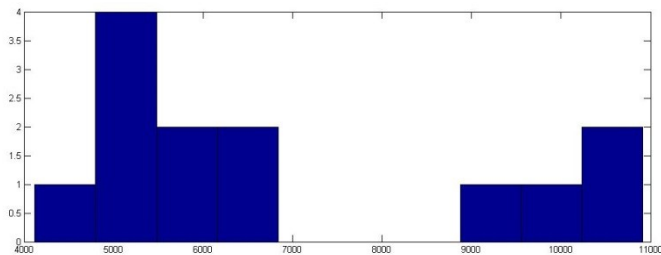
- We took each set and plotted their histogram
- They don't look normal



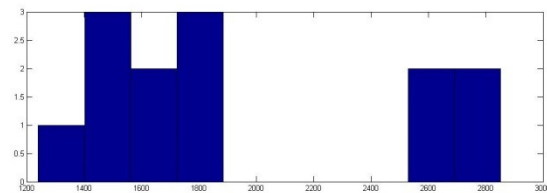
# Annual Data

- The mean of the Annual data is less than mean of the Monthly data
- The covariance using Annual data is close the covariance using Monthly data
- The Annual data shows the gap between the two peaks better

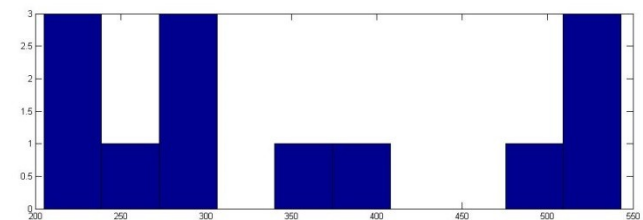
White



Black

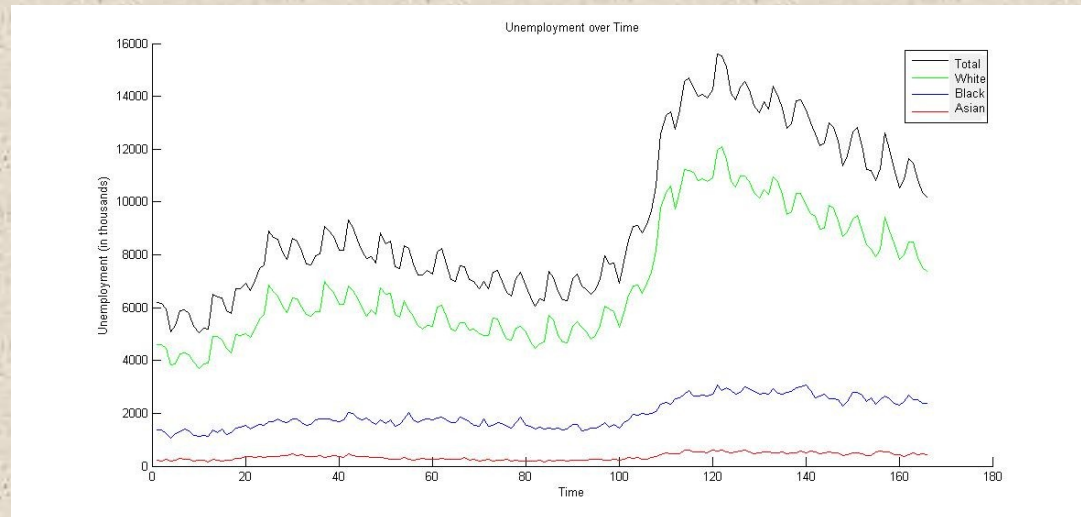


Asian

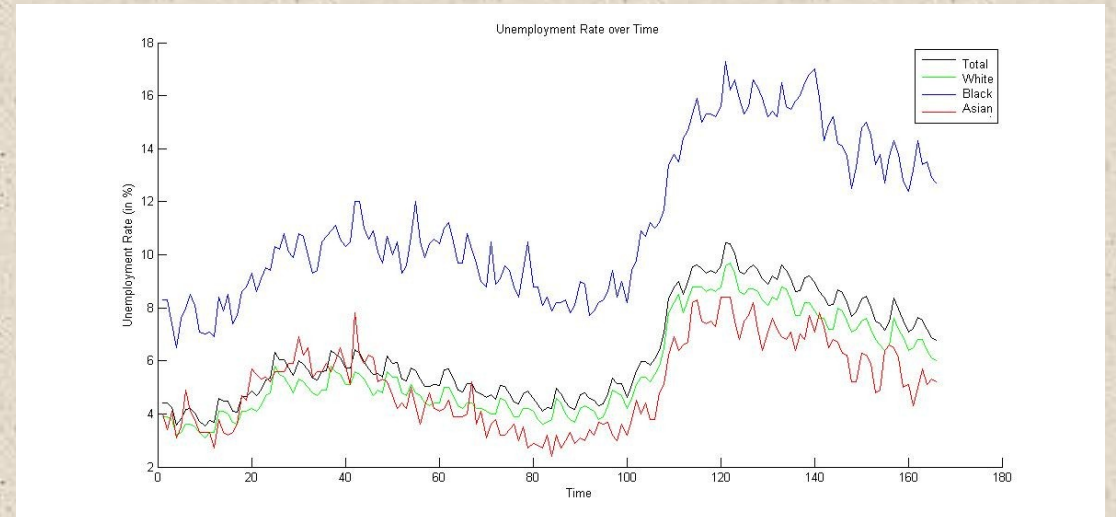


# White, Black, and Asian

This plot shows each distribution follow a similar curve over time

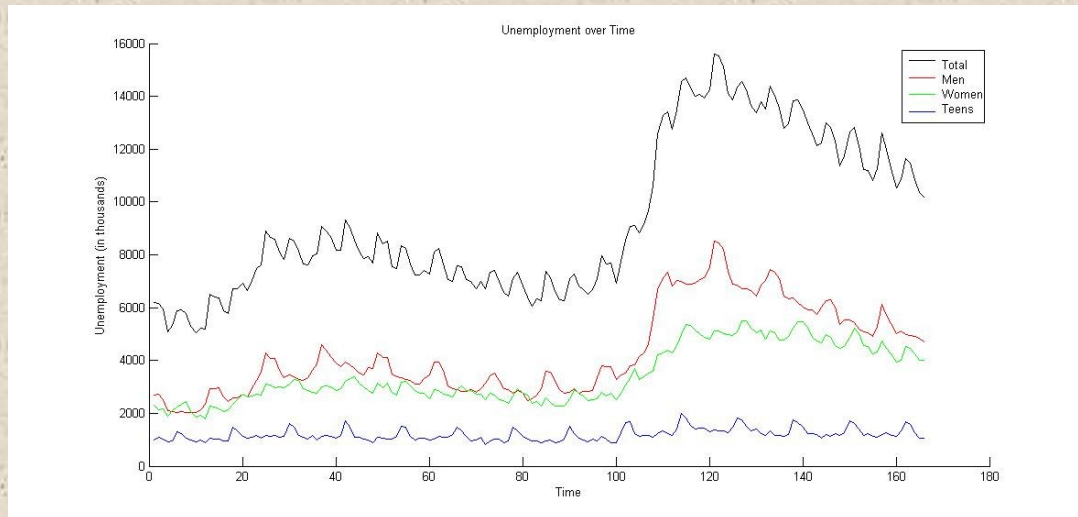


Comparing Total, White, Black, and Asian Unemployment Rate

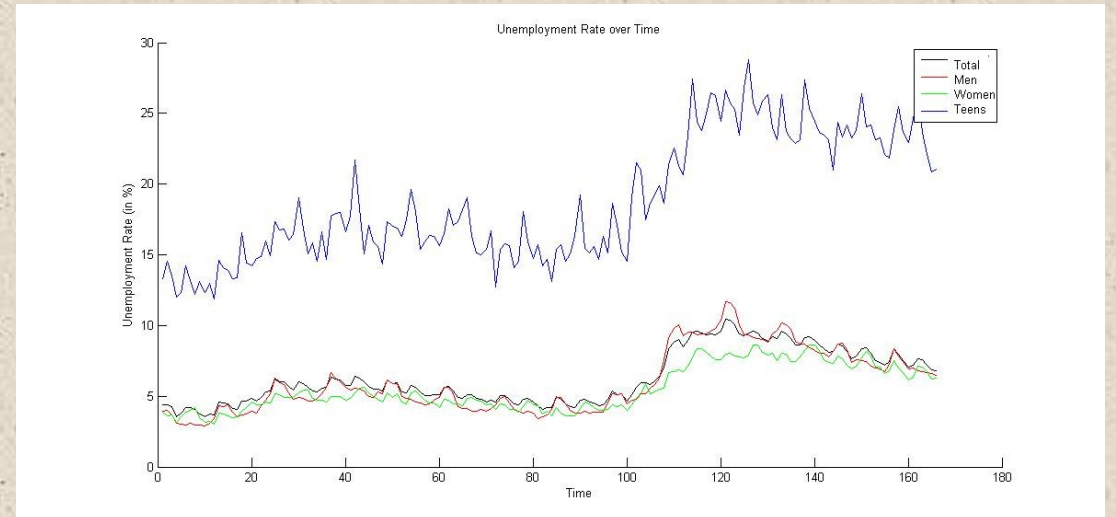


# Men, Women, and Teens

Once again we can see that they follow the same curve



Comparing Total, Men, Women, and Teens Unemployment Rate





# Summary

- We were able to take the unemployment data and ...
  - We find the covariance for each category is never 0, meaning none of them is completely independent to others.
  - However covariance we found are all really small, meaning they are not very correlated
  - We also found some negative covariance, meaning some of the categories, such as are negatively correlated

# Improve Projects

- Written outlines
  - Instructions that are less vague
  - Make clear the difficult parts
- Have the two parts more equal in workload
  - Have a Matlab file already with the data imported