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Script para calcular la tendencia global de datos y

una regresion por medio de un polinomio trigonometrico.

Los datos provienen de <http://www.cru.uea.ac.uk>

Se importan los datos 'hadcrut3vgl.txt'

tic y toc miden el tiempo que le lleva al programa ejecutarse.

```
tic
load hadcrut3vgl.txt
```

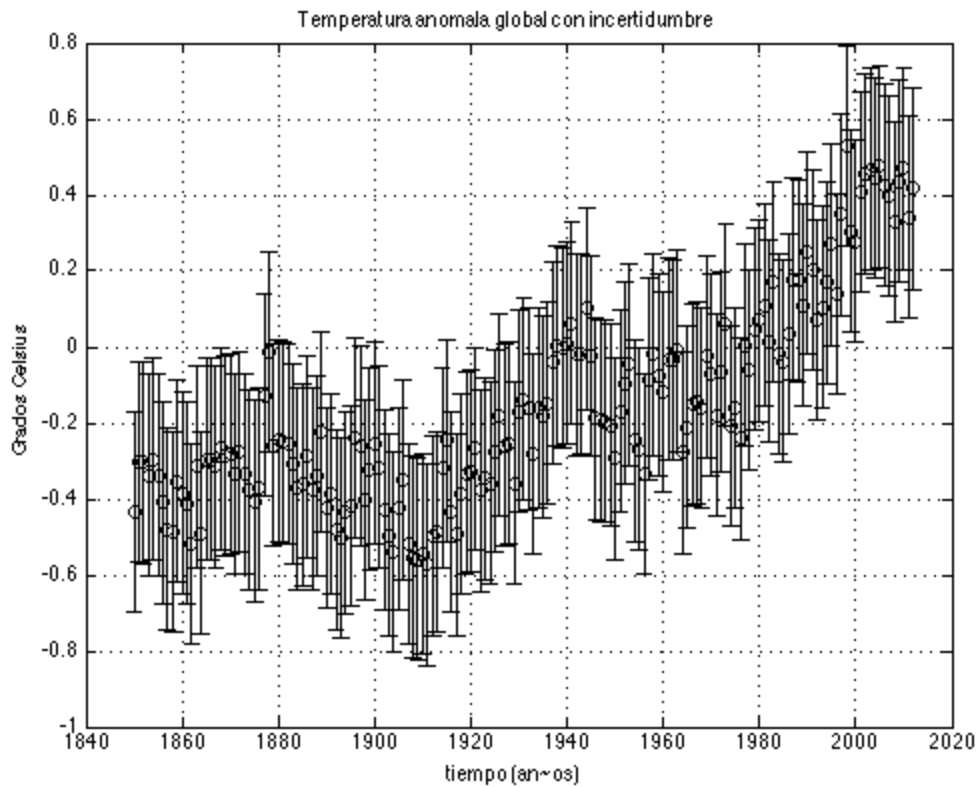
Se asignan variables a las columnas de los datos:

```
tiempo = hadcrut3vgl(:,1)/100;
% Convenientemente dividimos al tiempo entre 100
% para calcular los parametros sin matrices mal
% condicionadas.
aT = hadcrut3vgl(:,14);
N = length(tiempo); % Taman~o de la muestra de datos.
%
% Se calcula la desviacion estandar de los datos si no se tiene.
% de = sqrt(norm(aT-mean(aT))^2/(N-2));
de = std(aT);
% Barras de error de cada dato:
sigma = de*ones(size(tiempo));
```

Se despliegan en un grafico la temperatura vs el tiempo:

Escala temporal para graficar convenientemente.

```
t = 100*tiempo;
figure
errorbar(t, aT, sigma, 'ok');
title('Temperatura anomala global con incertidumbre')
xlabel('tiempo (an~os)')
ylabel('Grados Celsius')
grid on
```



Regresion L1 parabolica.

Se obtienen los parametros m1 a partir de la funcion 'regresionL1.m'. Dicha funcion nos proporciona tanto minimos cuadrados como norma L1. Elegi L1.

En las graficas usamos un tiempo no escalado, aqui en la regresion L1 el tiempo esta escalado por 100:

```
m1 = regresionL1(tiempo, aT, sigma);
```

Least-squares solution

m2 =

```
180.1981
-19.1474
-1.0152
```

1-norm solution

m1 =

```
190.4489
-20.2146
-1.0707
```

Covariance matrix

covm =

1.0e+03 *

1.5251	-0.1580	-0.0082
-0.1580	0.0164	0.0008
-0.0082	0.0008	0.0000

95% parameter confidence intervals on 2-norm solution

ans =

113.9065	180.1981	266.9914
-28.1457	-19.1474	-12.2836
-1.4814	-1.0152	-0.6600

Chi-square misfit

chi2 =

31.7566

Chi-square p-value

p =

1

s =

39.0523
4.0465
0.2095

Parameter correlations

r =

1.0000	-0.9999	-0.9998
-0.9999	1.0000	0.9999
-0.9998	0.9999	1.0000

covmemp =

1.0e+03 *

2.2049	-0.2285	-0.0118
-0.2285	0.0237	0.0012
-0.0118	0.0012	0.0001

confidence interval inclusion:

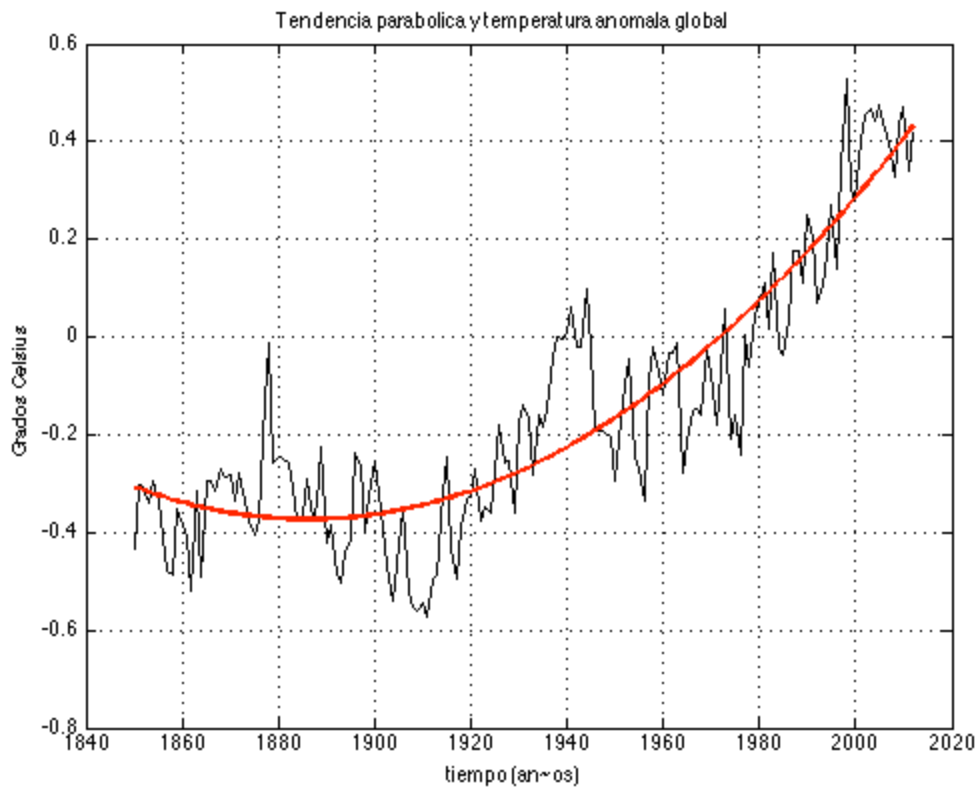
ans =

0.9465

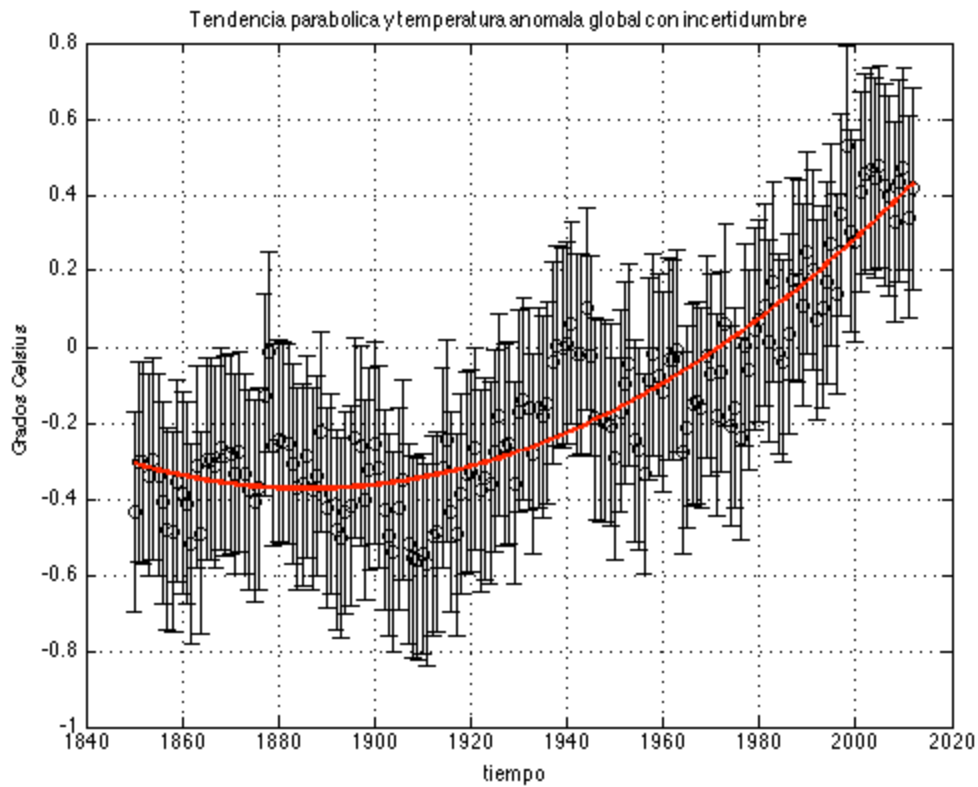
Modelo parabolico

```
modeloT = m1(1) + m1(2)*tiempo - (1/2*m1(3)*tiempo.^2);
```

```
figure  
plot(t,aT,'.-k')  
hold on  
plot(t,modeloT,'r','LineWidth',2)  
title('Tendencia parabolica y temperatura anomala global')  
xlabel('tiempo (an~os)')  
ylabel('Grados Celsius')  
grid on
```

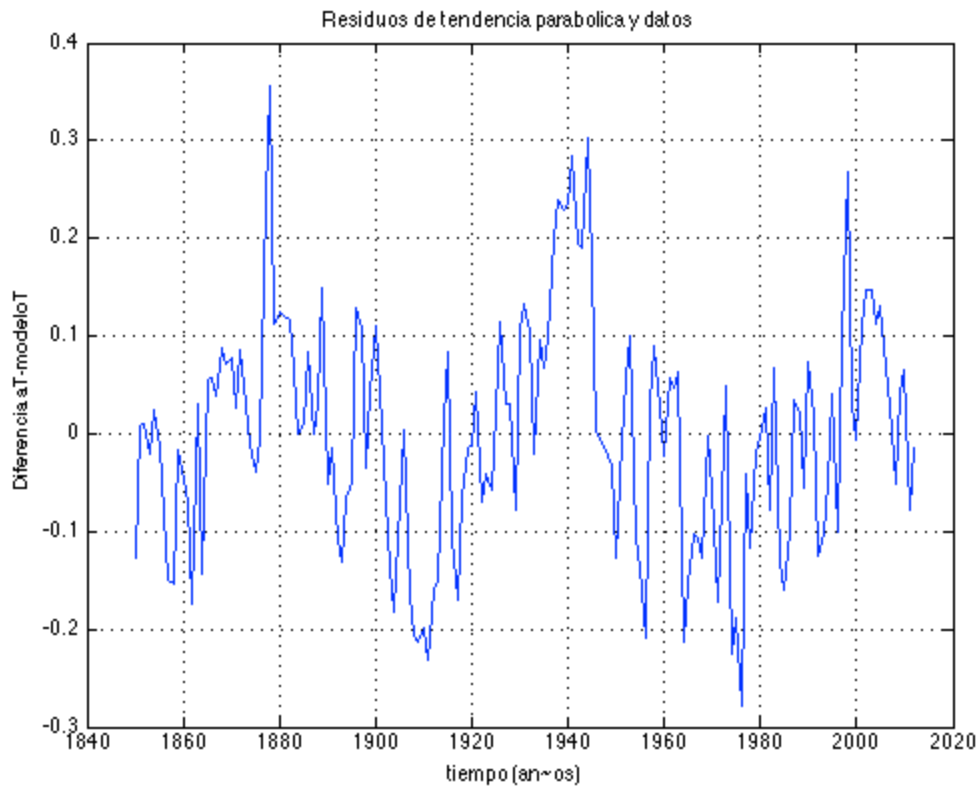


```
figure  
errorbar(t, aT, sigma,'ok');  
hold on  
plot(t,modeloT,'r','LineWidth',2)  
title('Tendencia parabolica y temperatura anomala global con incertidumbre')  
xlabel('tiempo')  
ylabel('Grados Celsius')  
grid on
```



Residuos: diferencia entre la regresion y los datos.

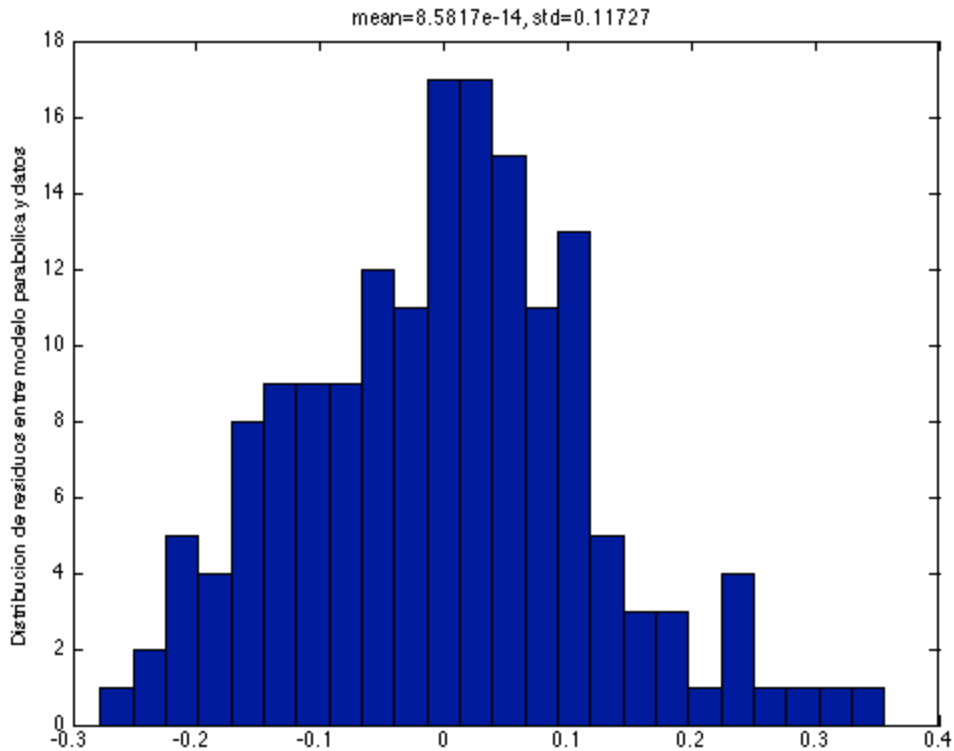
```
residuos = aT - modeloT;
figure
plot(t, residuos, '-.')
title('Residuos de tendencia parabolica y datos')
xlabel('tiempo (años)')
ylabel('Diferencia aT-modeloT')
grid on
```



Histograma de los residuos.

Aqui mostramos que tan bien esta hecho el ajuste, la distribucion debe ser lo mas simetrica posible alrededor del cero.

```
figure
hist(residuos,24)
ylabel('Distribucion de residuos entre modelo parabolica y datos')
mR = mean(residuos);
sd = std(residuos);
title(['mean=', num2str(mR), ', ', 'std=', num2str(sd)])
```



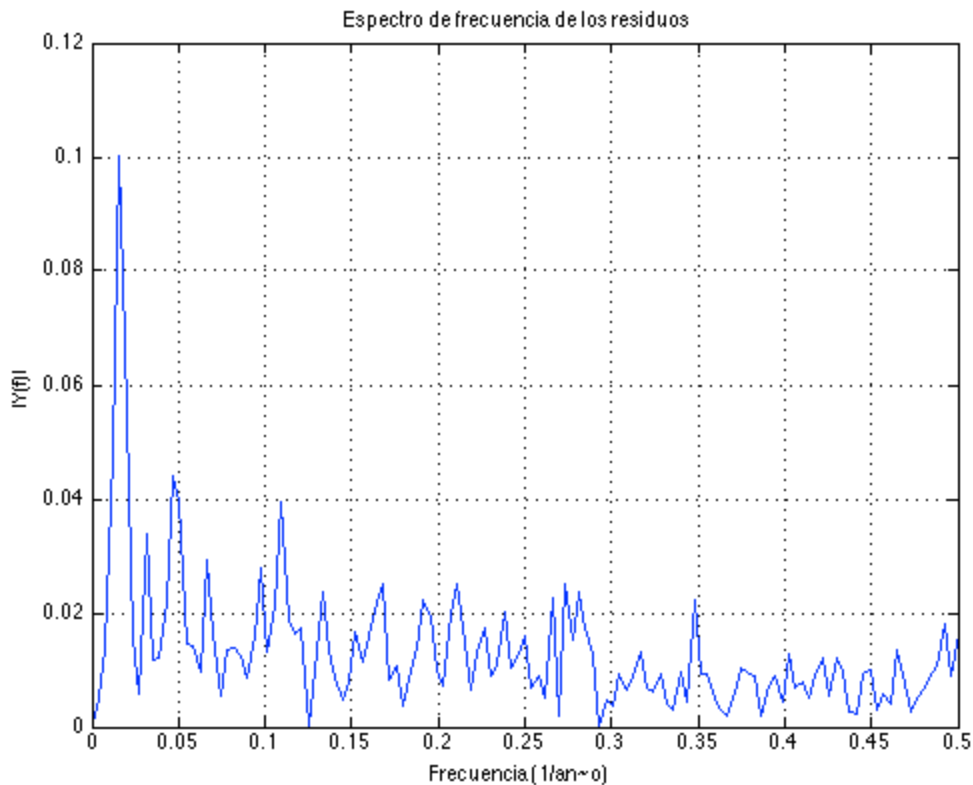
Analisis de Fourier de los residuos

```

Fs = 1.0; % Frecuencia de muestreo.
L = length(tiempo); % Longitud de la sen~al.
y = residuos;
% Matlab es mas rapido calculando FFT de longitud par:
NFFT = 2^nextpow2(L); % Siguiete potencia de 2 de la longitud de y
Y = fft(y,NFFT)/L;
f = Fs/2*linspace(0,1,NFFT/2+1);

% Grafica de la amplitud del espectro en frecuencias positivas.
figure
plot(f,2*abs(Y(1:NFFT/2+1)),'.-')
title('Espectro de frecuencia de los residuos')
xlabel('Frecuencia (1/an~o)')
ylabel('|Y(f)|')
grid on

```



Síntesis de Fourier basado en las primeras frecuencias más importantes.

```

amplitud = 2.0*std(y);
fase1 = -1.2*pi;
% Algunas frecuencias características tomadas del espectro.
fs1 = 0.0159;
fs2 = 0.03125;
fs3 = 0.04688;
fs4 = 0.06641;
fs5 = 0.09766;
fs6 = 0.1094;
% Polinomios trigonometricos
yaprox1 = amplitud*sin(2*pi*fs1*t + fase1);
yaprox2 = amplitud*(sin(2*pi*fs1*t + fase1) + sin(2*pi*fs3*t + fase1))/2.0;
yaprox3 = amplitud*(sin(2*pi*fs1*t + fase1) + sin(2*pi*fs2*t + fase1) + ...
    sin(2*pi*fs3*t + fase1))/3.0;

figure
plot(t,residuos)
hold on
plot(t,yaprox1,'r','LineWidth',2)
title('Datos y su aproximacion trigonometrica de grado 1')
xlabel('tiempo (años)')
ylabel('Residuos')

figure
plot(t,residuos)
hold on

```

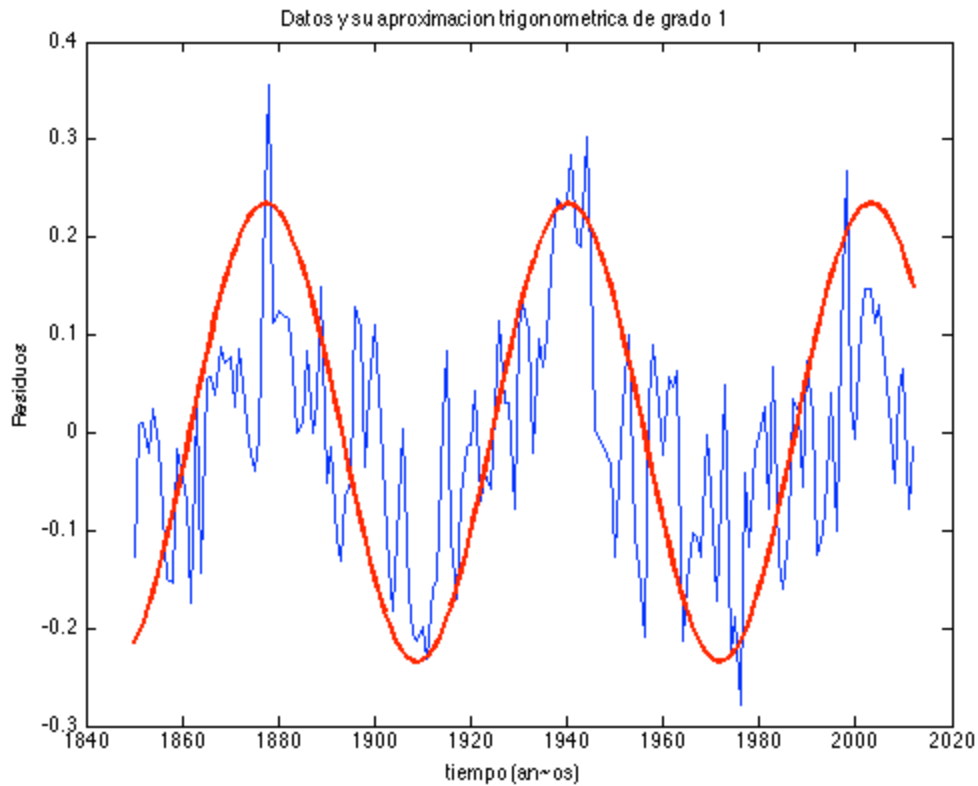


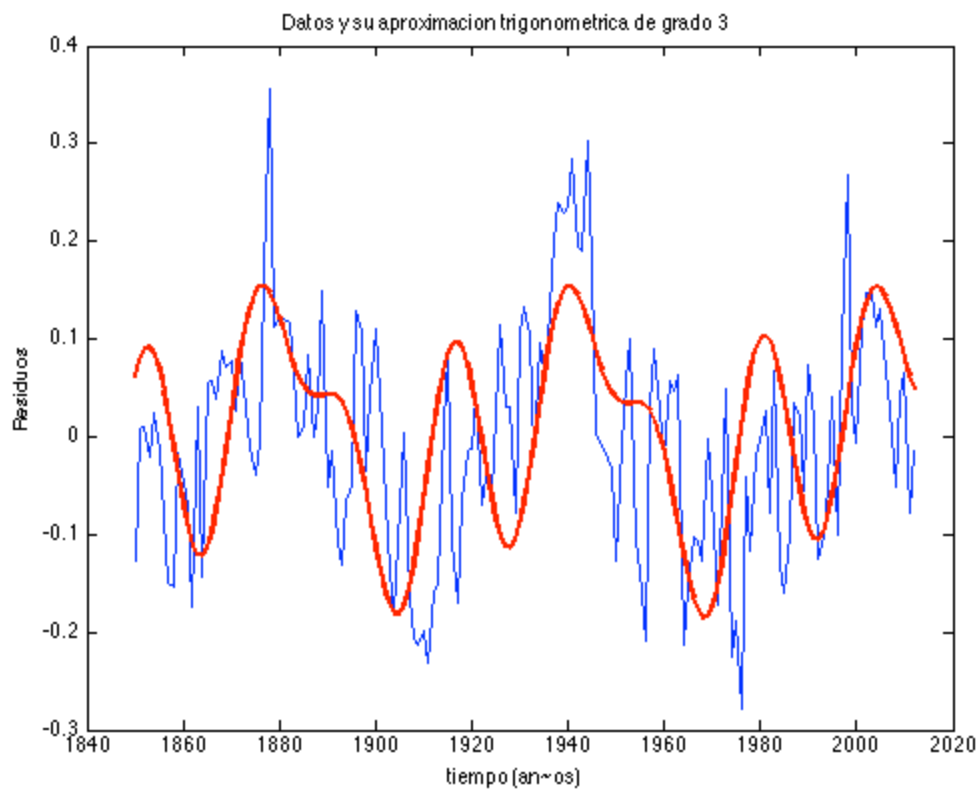
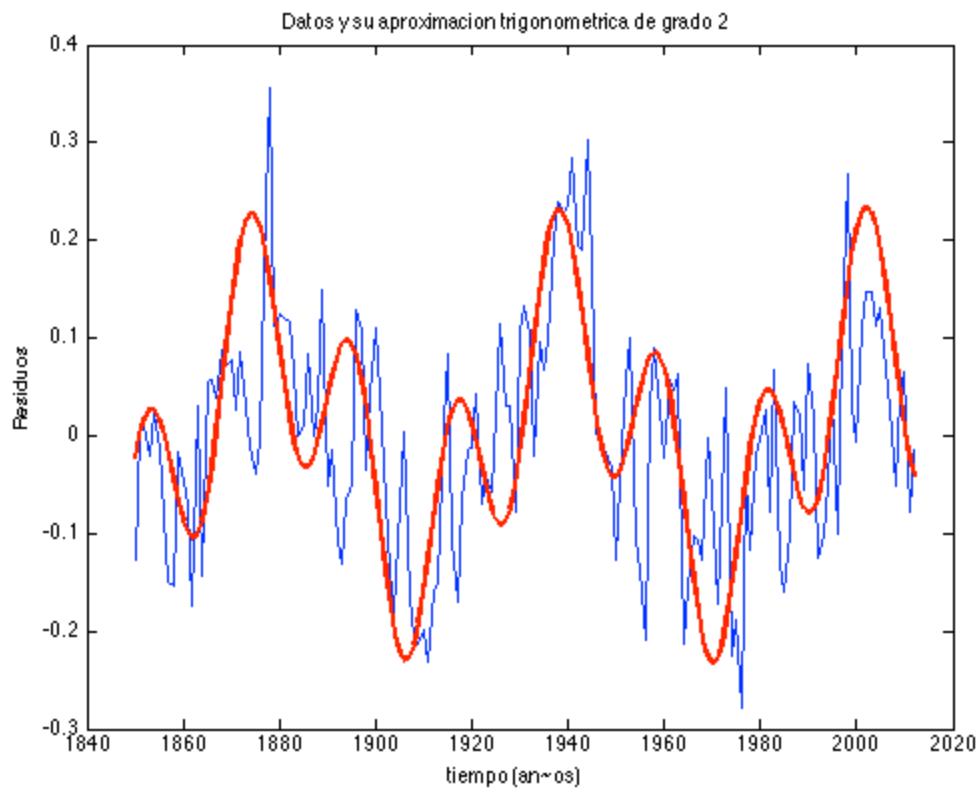
```

plot(t,yaprox2,'r','LineWidth',2)
title('Datos y su aproximacion trigonometrica de grado 2')
xlabel('tiempo (an~os)')
ylabel('Residuos')

figure
plot(t,residuos)
hold on
plot(t,yaprox3,'r','LineWidth',2)
title('Datos y su aproximacion trigonometrica de grado 3')
xlabel('tiempo (an~os)')
ylabel('Residuos')

```



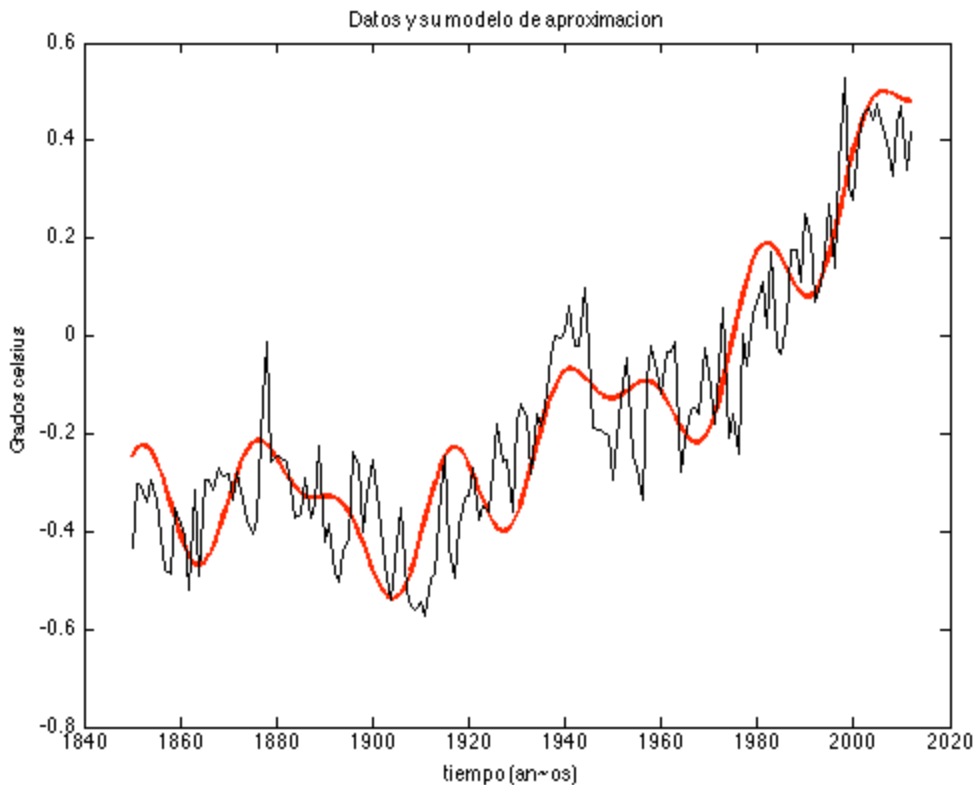


Modelo global: parábola + polinomio trigonometrico

```

mglob = modeloT + yaprox3;
figure
plot(t,mglob,'r','LineWidth',2)
hold on
plot(t,aT,'.-k')
title('Datos y su modelo de aproximacion')
xlabel('tiempo (an~os)')
ylabel('Grados celsius')

```



Despliega el contenido del archivo 'hadcrut3vgl.txt'

```
type hadcrut3vgl.txt
```

```
toc
```

```

1850 -0.675 -0.359 -0.742 -0.572 -0.410 -0.316 -0.257 -0.336 -0.487 -0.459 -0.282 -
1851 -0.308 -0.344 -0.436 -0.419 -0.368 -0.296 -0.282 -0.222 -0.269 -0.184 -0.250 -
1852 -0.385 -0.446 -0.508 -0.553 -0.265 -0.194 -0.147 -0.252 -0.257 -0.329 -0.271 -
1853 -0.232 -0.416 -0.399 -0.394 -0.340 -0.279 -0.220 -0.261 -0.418 -0.387 -0.281 -
1854 -0.376 -0.310 -0.291 -0.376 -0.263 -0.268 -0.267 -0.244 -0.204 -0.250 -0.420 -
1855 -0.271 -0.437 -0.372 -0.272 -0.364 -0.280 -0.332 -0.242 -0.375 -0.278 -0.284 -
1856 -0.257 -0.421 -0.535 -0.353 -0.246 -0.345 -0.351 -0.366 -0.473 -0.450 -0.631 -
1857 -0.566 -0.345 -0.468 -0.641 -0.548 -0.363 -0.528 -0.369 -0.421 -0.498 -0.648 -
1858 -0.468 -0.727 -0.568 -0.509 -0.632 -0.535 -0.384 -0.342 -0.407 -0.261 -0.643 -
1859 -0.350 -0.255 -0.376 -0.308 -0.338 -0.286 -0.358 -0.190 -0.591 -0.353 -0.371 -

```

1860	-0.245	-0.463	-0.584	-0.390	-0.352	-0.322	-0.222	-0.272	-0.299	-0.272	-0.499	-
1861	-0.791	-0.432	-0.450	-0.422	-0.705	-0.197	-0.302	-0.213	-0.390	-0.408	-0.401	-
1862	-0.697	-0.774	-0.438	-0.287	-0.259	-0.380	-0.417	-0.666	-0.426	-0.442	-0.733	-
1863	0.136	-0.076	-0.391	-0.274	-0.343	-0.440	-0.441	-0.383	-0.401	-0.454	-0.385	-
1864	-0.850	-0.571	-0.539	-0.554	-0.405	-0.266	-0.187	-0.364	-0.436	-0.692	-0.479	-
1865	-0.215	-0.590	-0.600	-0.192	-0.238	-0.267	-0.184	-0.269	-0.094	-0.347	-0.224	-
1866	-0.066	-0.212	-0.596	-0.256	-0.545	-0.042	-0.085	-0.315	-0.296	-0.409	-0.366	-
1867	-0.345	0.033	-0.652	-0.230	-0.485	-0.285	-0.312	-0.256	-0.137	-0.240	-0.319	-
1868	-0.685	-0.429	-0.064	-0.383	-0.092	-0.217	0.058	-0.149	-0.275	-0.294	-0.511	-
1869	-0.162	0.161	-0.571	-0.247	-0.276	-0.391	-0.303	-0.173	-0.233	-0.500	-0.422	-
1870	-0.079	-0.397	-0.458	-0.208	-0.178	-0.218	-0.048	-0.244	-0.298	-0.362	-0.201	-
1871	-0.448	-0.510	-0.036	-0.155	-0.273	-0.219	-0.085	-0.234	-0.421	-0.487	-0.569	-
1872	-0.317	-0.405	-0.489	-0.211	-0.113	-0.221	-0.175	-0.138	-0.208	-0.292	-0.329	-
1873	-0.106	-0.410	-0.314	-0.505	-0.402	-0.256	-0.186	-0.210	-0.366	-0.459	-0.480	-
1874	-0.026	-0.464	-0.564	-0.498	-0.434	-0.366	-0.179	-0.361	-0.236	-0.445	-0.543	-
1875	-0.576	-0.616	-0.605	-0.442	-0.195	-0.249	-0.290	-0.236	-0.330	-0.400	-0.518	-
1876	-0.280	-0.272	-0.410	-0.307	-0.470	-0.268	-0.168	-0.273	-0.431	-0.406	-0.565	-
1877	-0.299	0.011	-0.324	-0.311	-0.433	-0.113	-0.075	0.030	-0.050	-0.075	-0.014	-
1878	0.087	0.269	0.236	0.228	-0.122	-0.043	-0.083	-0.074	-0.059	-0.133	-0.141	-
1879	-0.220	-0.180	-0.197	-0.237	-0.181	-0.215	-0.218	-0.236	-0.232	-0.205	-0.463	-
1880	-0.005	-0.248	-0.189	-0.157	-0.243	-0.313	-0.256	-0.144	-0.241	-0.390	-0.455	-
1881	-0.389	-0.272	-0.262	-0.200	-0.076	-0.252	-0.143	-0.159	-0.296	-0.346	-0.417	-
1882	0.016	-0.081	-0.082	-0.301	-0.374	-0.350	-0.254	-0.273	-0.177	-0.336	-0.377	-
1883	-0.448	-0.350	-0.342	-0.361	-0.309	-0.109	-0.207	-0.225	-0.332	-0.390	-0.321	-
1884	-0.344	-0.257	-0.379	-0.482	-0.361	-0.369	-0.357	-0.347	-0.302	-0.301	-0.562	-
1885	-0.515	-0.476	-0.407	-0.418	-0.426	-0.464	-0.308	-0.367	-0.280	-0.297	-0.260	-
1886	-0.372	-0.475	-0.394	-0.186	-0.115	-0.284	-0.197	-0.202	-0.262	-0.309	-0.393	-
1887	-0.403	-0.479	-0.355	-0.376	-0.276	-0.377	-0.231	-0.353	-0.301	-0.490	-0.424	-
1888	-0.609	-0.502	-0.558	-0.260	-0.341	-0.265	-0.334	-0.302	-0.254	-0.182	-0.247	-
1889	-0.186	-0.172	-0.124	-0.069	-0.127	-0.185	-0.250	-0.279	-0.379	-0.331	-0.421	-
1890	-0.297	-0.352	-0.431	-0.331	-0.437	-0.410	-0.428	-0.451	-0.470	-0.504	-0.558	-
1891	-0.513	-0.506	-0.442	-0.373	-0.265	-0.369	-0.404	-0.375	-0.247	-0.361	-0.581	-
1892	-0.447	-0.182	-0.479	-0.500	-0.460	-0.451	-0.518	-0.463	-0.379	-0.481	-0.620	-
1893	-0.956	-0.761	-0.429	-0.572	-0.579	-0.470	-0.318	-0.348	-0.453	-0.337	-0.457	-
1894	-0.447	-0.423	-0.401	-0.423	-0.455	-0.491	-0.365	-0.376	-0.502	-0.482	-0.457	-
1895	-0.513	-0.714	-0.542	-0.432	-0.416	-0.355	-0.403	-0.309	-0.268	-0.374	-0.338	-
1896	-0.269	-0.251	-0.423	-0.372	-0.248	-0.169	-0.185	-0.148	-0.185	-0.187	-0.321	-
1897	-0.288	-0.211	-0.347	-0.137	-0.110	-0.195	-0.202	-0.215	-0.179	-0.281	-0.477	-
1898	-0.128	-0.371	-0.692	-0.518	-0.448	-0.316	-0.367	-0.321	-0.323	-0.519	-0.456	-
1899	-0.238	-0.527	-0.550	-0.363	-0.339	-0.381	-0.325	-0.232	-0.203	-0.232	-0.024	-
1900	-0.273	-0.258	-0.336	-0.308	-0.287	-0.206	-0.248	-0.247	-0.275	-0.148	-0.322	-
1901	-0.229	-0.328	-0.312	-0.273	-0.253	-0.237	-0.236	-0.267	-0.391	-0.354	-0.455	-
1902	-0.242	-0.314	-0.410	-0.477	-0.427	-0.476	-0.428	-0.414	-0.416	-0.490	-0.519	-
1903	-0.298	-0.228	-0.382	-0.491	-0.502	-0.560	-0.494	-0.598	-0.549	-0.626	-0.598	-
1904	-0.667	-0.609	-0.637	-0.577	-0.565	-0.534	-0.552	-0.505	-0.492	-0.492	-0.405	-
1905	-0.517	-0.711	-0.500	-0.577	-0.400	-0.383	-0.356	-0.342	-0.351	-0.402	-0.289	-
1906	-0.191	-0.313	-0.365	-0.194	-0.370	-0.358	-0.372	-0.366	-0.399	-0.416	-0.508	-
1907	-0.486	-0.541	-0.407	-0.563	-0.606	-0.586	-0.462	-0.507	-0.467	-0.426	-0.604	-
1908	-0.478	-0.502	-0.646	-0.567	-0.545	-0.507	-0.529	-0.552	-0.489	-0.621	-0.622	-
1909	-0.580	-0.582	-0.686	-0.651	-0.620	-0.549	-0.596	-0.400	-0.402	-0.500	-0.470	-
1910	-0.424	-0.586	-0.482	-0.482	-0.558	-0.561	-0.486	-0.514	-0.494	-0.546	-0.695	-
1911	-0.586	-0.750	-0.701	-0.732	-0.626	-0.574	-0.539	-0.525	-0.512	-0.518	-0.452	-
1912	-0.422	-0.401	-0.464	-0.395	-0.438	-0.392	-0.502	-0.592	-0.596	-0.678	-0.563	-
1913	-0.518	-0.563	-0.576	-0.500	-0.562	-0.558	-0.498	-0.443	-0.472	-0.491	-0.347	-
1914	-0.162	-0.326	-0.385	-0.426	-0.349	-0.335	-0.375	-0.285	-0.348	-0.243	-0.271	-
1915	-0.223	-0.128	-0.333	-0.159	-0.325	-0.312	-0.201	-0.192	-0.222	-0.312	-0.226	-

1916	-0.314	-0.280	-0.472	-0.407	-0.429	-0.512	-0.414	-0.390	-0.381	-0.412	-0.557	-
1917	-0.650	-0.744	-0.792	-0.531	-0.674	-0.377	-0.180	-0.278	-0.210	-0.427	-0.406	-
1918	-0.548	-0.543	-0.465	-0.515	-0.479	-0.342	-0.372	-0.397	-0.344	-0.189	-0.176	-
1919	-0.202	-0.155	-0.370	-0.200	-0.335	-0.291	-0.365	-0.362	-0.275	-0.366	-0.584	-
1920	-0.321	-0.499	-0.200	-0.354	-0.258	-0.293	-0.349	-0.310	-0.245	-0.337	-0.369	-
1921	-0.221	-0.291	-0.314	-0.293	-0.218	-0.175	-0.206	-0.342	-0.232	-0.228	-0.407	-
1922	-0.445	-0.399	-0.365	-0.337	-0.415	-0.373	-0.336	-0.377	-0.360	-0.379	-0.362	-
1923	-0.312	-0.484	-0.442	-0.443	-0.364	-0.307	-0.428	-0.419	-0.370	-0.346	-0.133	-
1924	-0.354	-0.257	-0.346	-0.362	-0.340	-0.301	-0.354	-0.308	-0.365	-0.331	-0.396	-
1925	-0.444	-0.309	-0.291	-0.284	-0.324	-0.309	-0.277	-0.210	-0.227	-0.365	-0.171	-
1926	-0.024	-0.114	-0.100	-0.239	-0.255	-0.187	-0.305	-0.127	-0.182	-0.165	-0.192	-
1927	-0.283	-0.220	-0.355	-0.300	-0.293	-0.260	-0.219	-0.195	-0.176	-0.112	-0.243	-
1928	-0.166	-0.248	-0.388	-0.315	-0.285	-0.362	-0.200	-0.226	-0.236	-0.200	-0.180	-
1929	-0.435	-0.639	-0.426	-0.369	-0.380	-0.357	-0.375	-0.235	-0.286	-0.199	-0.141	-
1930	-0.362	-0.235	-0.199	-0.209	-0.229	-0.190	-0.166	-0.097	-0.113	-0.117	0.001	-
1931	-0.048	-0.196	-0.147	-0.202	-0.223	-0.099	-0.081	-0.106	-0.115	-0.093	-0.204	-
1932	0.073	-0.213	-0.273	-0.135	-0.205	-0.195	-0.141	-0.185	-0.069	-0.139	-0.235	-
1933	-0.288	-0.359	-0.344	-0.257	-0.246	-0.243	-0.207	-0.198	-0.218	-0.204	-0.316	-
1934	-0.249	-0.210	-0.390	-0.271	-0.131	-0.061	-0.081	-0.071	-0.123	-0.119	-0.057	-
1935	-0.244	0.046	-0.237	-0.270	-0.251	-0.184	-0.136	-0.154	-0.153	-0.087	-0.284	-
1936	-0.273	-0.345	-0.254	-0.220	-0.148	-0.154	-0.031	-0.055	-0.099	-0.045	-0.115	-
1937	-0.191	-0.016	-0.248	-0.132	-0.092	-0.009	0.046	0.084	0.107	0.092	-0.026	-
1938	-0.006	0.021	0.067	0.056	-0.061	-0.031	-0.023	0.036	0.068	0.127	0.016	-
1939	-0.061	-0.062	-0.200	-0.060	0.004	0.090	0.079	0.084	-0.009	-0.150	-0.015	-
1940	-0.209	-0.055	-0.085	0.016	0.009	0.023	0.109	0.056	0.121	0.017	-0.044	-
1941	-0.033	0.075	-0.064	0.123	0.003	0.130	0.146	0.080	-0.062	0.224	0.090	-
1942	0.171	-0.096	-0.045	-0.039	0.013	0.058	-0.065	-0.033	-0.007	-0.041	-0.085	-
1943	-0.207	0.003	-0.189	-0.035	0.004	-0.095	0.029	-0.058	-0.013	0.191	0.001	-
1944	0.245	0.110	0.081	-0.024	0.030	0.115	0.175	0.184	0.216	0.168	-0.013	-
1945	-0.039	-0.092	-0.061	0.080	-0.155	-0.031	-0.099	0.306	0.083	0.069	-0.069	-
1946	-0.018	-0.030	-0.223	-0.069	-0.248	-0.326	-0.154	-0.247	-0.114	-0.178	-0.226	-
1947	-0.247	-0.297	-0.214	-0.100	-0.215	-0.134	-0.149	-0.181	-0.224	-0.104	-0.161	-
1948	-0.060	-0.266	-0.330	-0.201	-0.092	-0.097	-0.237	-0.160	-0.194	-0.161	-0.237	-
1949	-0.017	-0.258	-0.300	-0.183	-0.182	-0.293	-0.212	-0.158	-0.196	-0.177	-0.190	-
1950	-0.469	-0.349	-0.291	-0.284	-0.209	-0.210	-0.206	-0.236	-0.209	-0.247	-0.493	-
1951	-0.426	-0.535	-0.366	-0.223	-0.142	-0.081	-0.079	0.004	-0.026	-0.041	-0.143	-
1952	0.050	-0.012	-0.232	-0.086	-0.103	-0.096	-0.059	-0.040	-0.017	-0.112	-0.288	-
1953	-0.059	0.009	0.003	0.019	-0.040	-0.018	-0.097	-0.042	-0.045	-0.050	-0.183	-
1954	-0.338	-0.193	-0.257	-0.305	-0.332	-0.246	-0.305	-0.200	-0.182	-0.162	-0.100	-
1955	-0.028	-0.237	-0.453	-0.333	-0.309	-0.264	-0.276	-0.160	-0.195	-0.228	-0.365	-
1956	-0.322	-0.417	-0.376	-0.385	-0.357	-0.307	-0.294	-0.305	-0.336	-0.273	-0.335	-
1957	-0.260	-0.209	-0.216	-0.137	-0.056	-0.018	-0.080	-0.001	-0.041	-0.087	-0.011	-
1958	0.193	0.102	-0.059	-0.038	-0.056	-0.068	-0.042	-0.065	-0.109	-0.041	-0.038	-
1959	-0.012	-0.041	-0.013	-0.042	-0.103	-0.028	-0.079	-0.052	-0.036	-0.123	-0.233	-
1960	-0.102	0.050	-0.366	-0.221	-0.229	-0.104	-0.100	-0.076	-0.031	-0.092	-0.197	-
1961	-0.006	0.084	0.012	-0.018	0.013	0.033	-0.065	-0.005	-0.095	-0.085	-0.091	-
1962	-0.034	0.064	-0.064	-0.076	-0.096	-0.071	-0.019	-0.031	-0.022	0.009	-0.039	-
1963	-0.117	0.106	-0.151	-0.131	-0.058	-0.073	0.058	0.059	0.034	0.140	0.057	-
1964	-0.082	-0.234	-0.329	-0.292	-0.226	-0.224	-0.226	-0.314	-0.329	-0.326	-0.324	-
1965	-0.195	-0.315	-0.299	-0.302	-0.215	-0.168	-0.236	-0.194	-0.174	-0.103	-0.195	-
1966	-0.169	-0.130	-0.123	-0.182	-0.205	-0.076	-0.062	-0.114	-0.116	-0.169	-0.189	-
1967	-0.211	-0.278	-0.155	-0.129	-0.032	-0.169	-0.151	-0.113	-0.158	-0.020	-0.156	-
1968	-0.293	-0.284	-0.043	-0.231	-0.249	-0.144	-0.117	-0.115	-0.127	-0.079	-0.091	-
1969	-0.251	-0.186	-0.028	0.061	0.042	-0.038	-0.019	-0.003	-0.027	-0.028	0.056	-
1970	0.001	0.093	-0.119	0.019	-0.080	-0.078	-0.102	-0.113	-0.097	-0.122	-0.093	-
1971	-0.087	-0.294	-0.289	-0.228	-0.207	-0.230	-0.121	-0.162	-0.124	-0.153	-0.074	-

1972	-0.350	-0.310	-0.149	-0.064	-0.063	0.005	-0.016	0.007	-0.058	0.010	0.035	
1973	0.157	0.263	0.225	0.134	0.087	0.084	0.005	-0.005	-0.047	-0.029	-0.086	-
1974	-0.361	-0.372	-0.238	-0.183	-0.180	-0.155	-0.129	-0.110	-0.162	-0.190	-0.181	-
1975	-0.072	-0.114	-0.067	-0.102	-0.104	-0.119	-0.140	-0.183	-0.156	-0.241	-0.314	-
1976	-0.240	-0.302	-0.434	-0.210	-0.287	-0.257	-0.207	-0.196	-0.171	-0.291	-0.188	-
1977	-0.173	0.051	0.099	0.055	0.025	0.063	-0.007	-0.044	0.013	-0.022	0.087	-
1978	0.015	-0.006	0.008	-0.064	-0.121	-0.117	-0.061	-0.163	-0.063	-0.105	0.018	-
1979	-0.041	-0.093	0.024	-0.057	-0.036	0.032	0.044	0.066	0.086	0.099	0.119	
1980	0.096	0.148	0.035	0.127	0.111	0.069	0.039	0.010	0.015	-0.003	0.134	
1981	0.250	0.158	0.185	0.098	0.067	0.101	0.073	0.078	0.060	0.000	0.032	
1982	-0.028	-0.025	-0.104	0.031	0.041	-0.034	-0.019	-0.005	0.068	0.021	0.016	
1983	0.362	0.306	0.181	0.113	0.109	0.118	0.137	0.176	0.149	0.093	0.232	
1984	0.089	0.013	0.049	-0.019	0.065	-0.016	-0.024	0.034	0.025	-0.035	-0.123	-
1985	-0.001	-0.155	-0.032	-0.042	0.001	-0.049	-0.042	0.013	-0.035	-0.008	-0.093	-
1986	0.121	0.065	0.049	0.045	0.023	0.055	0.004	-0.001	0.016	0.043	-0.033	
1987	0.116	0.266	0.021	0.084	0.145	0.121	0.238	0.219	0.250	0.174	0.186	
1988	0.334	0.189	0.248	0.224	0.175	0.200	0.168	0.154	0.149	0.120	0.027	
1989	0.019	0.094	0.088	0.083	0.073	0.094	0.167	0.168	0.135	0.145	0.067	
1990	0.187	0.242	0.442	0.285	0.231	0.233	0.196	0.227	0.179	0.271	0.278	
1991	0.224	0.272	0.161	0.299	0.249	0.269	0.271	0.225	0.176	0.133	0.079	
1992	0.266	0.250	0.199	0.132	0.125	0.118	-0.008	-0.007	-0.062	-0.072	-0.097	
1993	0.204	0.161	0.202	0.121	0.158	0.122	0.088	0.060	0.013	0.061	-0.041	
1994	0.160	-0.072	0.176	0.173	0.218	0.191	0.141	0.175	0.156	0.230	0.248	
1995	0.349	0.449	0.286	0.229	0.176	0.283	0.276	0.305	0.210	0.241	0.266	
1996	0.069	0.246	0.130	0.097	0.177	0.159	0.177	0.178	0.093	0.089	0.077	
1997	0.156	0.247	0.262	0.201	0.254	0.367	0.372	0.406	0.457	0.485	0.449	
1998	0.486	0.739	0.520	0.608	0.570	0.579	0.651	0.616	0.400	0.409	0.342	
1999	0.366	0.540	0.290	0.322	0.248	0.266	0.282	0.253	0.274	0.241	0.223	
2000	0.212	0.363	0.334	0.446	0.271	0.252	0.261	0.338	0.309	0.213	0.159	
2001	0.329	0.289	0.475	0.426	0.399	0.416	0.452	0.498	0.405	0.378	0.491	
2002	0.568	0.593	0.586	0.443	0.432	0.455	0.462	0.417	0.413	0.362	0.397	
2003	0.514	0.427	0.418	0.408	0.439	0.437	0.457	0.514	0.499	0.550	0.419	
2004	0.496	0.560	0.501	0.484	0.323	0.350	0.380	0.418	0.442	0.468	0.521	
2005	0.452	0.364	0.493	0.530	0.476	0.506	0.532	0.502	0.498	0.495	0.478	
2006	0.320	0.435	0.380	0.378	0.352	0.442	0.456	0.482	0.425	0.472	0.440	
2007	0.601	0.498	0.435	0.466	0.372	0.382	0.394	0.358	0.402	0.362	0.266	
2008	0.074	0.198	0.447	0.278	0.283	0.315	0.406	0.407	0.378	0.440	0.394	
2009	0.376	0.374	0.369	0.409	0.402	0.499	0.504	0.531	0.462	0.442	0.446	
2010	0.477	0.462	0.568	0.558	0.512	0.530	0.536	0.487	0.392	0.397	0.452	
2011	0.204	0.269	0.326	0.405	0.339	0.426	0.451	0.432	0.362	0.356	0.265	
2012	0.231	0.208	0.308	0.470	0.470	0.477	0.453	0.519	0.509	0.477	0.459	

Elapsed time is 47.776017 seconds.