Laboratorio 1

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Importar la base de datos de Hepatitis

```
datafile = pwd + "\hepatiti.pat";
hepatiti = importHepatitis(datafile);
hepatiti = table2array(hepatiti);
hepatiti(:,20:21) = [];
hepa_c1 = hepatiti(1:33,:);
hepa_c2 = hepatiti(34:end,:);
```

Tablas estadisticas clase 1

La primer fila es la media, la segunda fila es la desviación estandar, la tercera es la varianza, la cuarta es el IQR, la quinta es el skeweness, y la sexta es kurtosis.

Eliminando las columnas de clase

```
estadistica_c1 = zeros(6,19);
estadistica_c1(1,:) = mean(hepa_c1);
estadistica_c1(2,:) = std(hepa_c1);
estadistica_c1(3,:) = var(hepa_c1);
estadistica_c1(4,:) = iqr(hepa_c1);
estadistica_c1(5,:) = skewness(hepa_c1);
estadistica_c1(6,:) = kurtosis(hepa_c1);
estadistica_c1 = array2table(estadistica_c1);
estadistica_c1.Properties.RowNames = {'Media', 'Desviacion estandar', 'Varianza', ...
    'IQR', 'Skewness', 'Kurtosis'};
estadistica_c1.Properties.VariableNames = {'var1', 'var2', 'var3', 'var4', 'var5', ...
    'var6', 'var7', 'var8', 'var9', 'var10', 'var11', 'var12', 'var13', 'var14', ...
    'var15', 'var16', 'var17', 'var18', 'var19',};
estadistica_c1(:,estadistica_c1.Properties.VariableNames(1:6))
```

ans = 6×6 table

	var1	var2	var3	var4	var5	var6
1 Media	46.0909	1.0303	1.3636	1.9394	1.0909	1.3030
2 Desviacion estandar	10.2053	0.1741	0.4885	0.2423	0.2919	0.4667
3 Varianza	104.1477	0.0303	0.2386	0.0587	0.0852	0.2178

	var1	var2	var3	var4	var5	var6
4 IQR	16.5000	0	1.0000	0	0	1.0000
5 Skewness	0.2838	5.4801	0.5669	-3.6830	2.8460	0.8572
6 Kurtosis	2.3828	31.0313	1.3214	14.5645	9.1000	1.7348

```
estadistica_c1(:,estadistica_c1.Properties.VariableNames(7:12))
```

ans = 6×6 table

	var7	var8	var9	var10	var11	var12
1 Media	1.6970	1.8788	1.6061	1.6364	1.3030	1.5758
2 Desviacion estandar	0.4667	0.3314	0.4962	0.4885	0.4667	0.5019
3 Varianza	0.2178	0.1098	0.2462	0.2386	0.2178	0.2519
4 IQR	1.0000	0	1.0000	1.0000	1.0000	1.0000
5 Skewness	-0.8572	-2.3212	-0.4341	-0.5669	0.8572	-0.3066
6 Kurtosis	1.7348	6.3879	1.1885	1.3214	1.7348	1.0940

```
estadistica_c1(:,estadistica_c1.Properties.VariableNames(13:18))
```

ans = 6×6 table

	var13	var14	var15	var16	var17	var18
1 Media	1.6667	2.4964	121.2436	97.3533	3.1773	44.1991
2 Desviacion estandar	0.4787	1.8663	46.5337	97.9221	0.5625	12.8605
3 Varianza	0.2292	3.4832	2.1654e+03	9.5887e+03	0.3164	165.3937
4 IQR	1.0000	2.0000	43.2500	72	0.7500	6.2500
5 Skewness	-0.7071	1.4128	1.6007	2.8086	0.0291	1.8607
6 Kurtosis	1.5000	4.7078	6.3332	12.4915	2.2687	6.8205

```
estadistica_c1(:,estadistica_c1.Properties.VariableNames(19))
```

ans = 6×1 table

	var19
1 Media	1.7576
2 Desviacion estandar	0.4352
3 Varianza	0.1894
4 IQR	0.2500
5 Skewness	-1.2021
6 Kurtosis	2.4450

Tablas estadisticas clase 2

```
estadistica_c2 = zeros(6,19);
estadistica_c2(1,:) = mean(hepa_c2);
```

```
estadistica_c2(2,:) = std(hepa_c2);
estadistica_c2(3,:) = var(hepa_c2);
estadistica_c2(4,:) = iqr(hepa_c2);
estadistica_c2(5,:) = skewness(hepa_c2);
estadistica_c2(6,:) = kurtosis(hepa_c2);
estadistica_c2 = array2table(estadistica_c2);
estadistica_c2.Properties.RowNames = {'Media', 'Desviacion estandar', 'Varianza', ...
    'IQR', 'Skewness', 'Kurtosis'};
estadistica_c2.Properties.VariableNames = {'var1', 'var2', 'var3', 'var4', 'var5', ...
    'var6', 'var7', 'var8', 'var9', 'var10', 'var11', 'var12', 'var13', 'var14', ...
    'var15', 'var16', 'var17', 'var18', 'var19',};
estadistica_c2(:,estadistica_c2.Properties.VariableNames(1:6))
```

ans = 6×6 table

	var1	var2	var3	var4	var5	var6
1 Media	39.8770	1.1230	1.5492	1.8197	1.4180	1.6885
2 Desviacion estandar	12.8504	0.3297	0.4996	0.3860	0.4953	0.4650
3 Varianza	165.1335	0.1087	0.2496	0.1490	0.2453	0.2162
4 IQR	20.0000	0	1.0000	0	1.0000	1.0000
5 Skewness	0.4986	2.2964	-0.1977	-1.6630	0.3324	-0.8142
6 Kurtosis	3.0206	6.2735	1.0391	3.7655	1.1105	1.6629

```
estadistica_c2(:,estadistica_c2.Properties.VariableNames(7:12))
```

ans = 6×6 table

	var7	var8	var9	var10	var11	var12
1 Media	1.8197	1.8279	1.6148	1.8525	1.7623	1.9508
2 Desviacion estandar	0.3860	0.3791	0.4887	0.3561	0.4274	0.2171
3 Varianza	0.1490	0.1437	0.2388	0.1268	0.1827	0.0471
4 IQR	0	0	1.0000	0	0	0
5 Skewness	-1.6630	-1.7371	-0.4716	-1.9877	-1.2324	-4.1695
6 Kurtosis	3.7655	4.0174	1.2224	4.9509	2.5187	18.3851

```
estadistica_c2(:,estadistica_c2.Properties.VariableNames(13:18))
```

ans = 6×6 table

	var13	var14	var15	var16	var17	var18
1 Media	1.9426	1.1475	101.4468	82.9662	3.9777	66.5708
2 Desviacion estandar	0.2335	0.7130	45.8899	85.9457	0.5325	16.5462
3 Varianza	0.0545	0.5084	2.1059e+03	7.3867e+03	0.2836	273.7780
4 IQR	0	0.5000	39	60	0.4000	8.0000
5 Skewness	-3.8065	2.7919	1.4830	3.3092	0.2682	-0.3716
6 Kurtosis	15.4894	12.0483	5.9181	18.6660	6.1825	5.3413

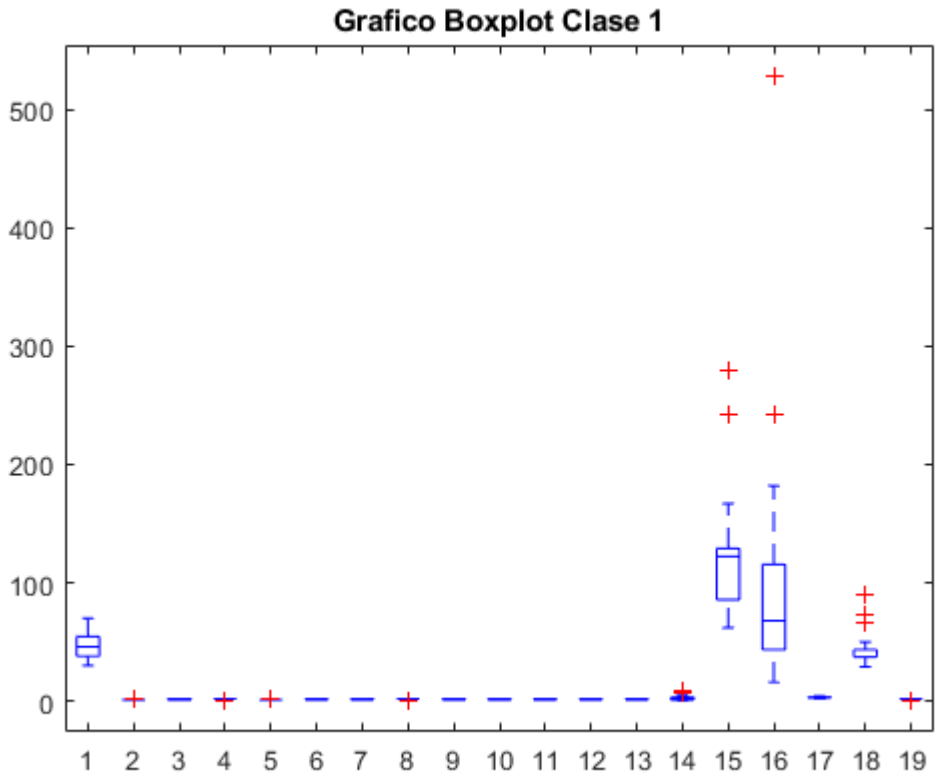
```
estadistica_c2(:,estadistica_c2.Properties.VariableNames(19))
```

ans = 6×1 table

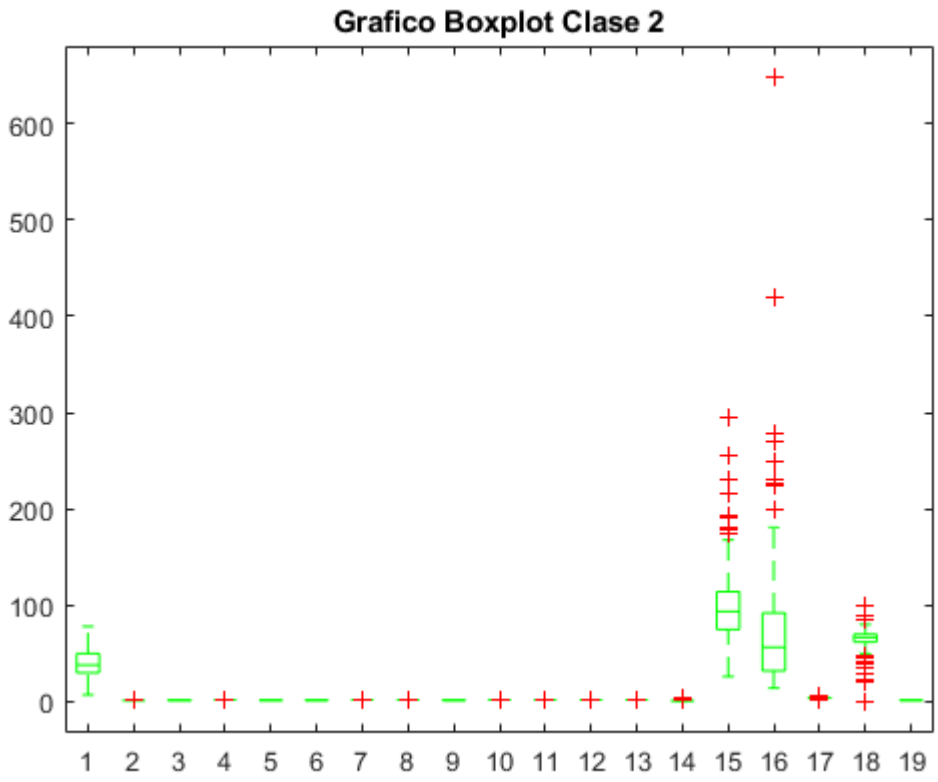
	var19
1 Media	1.3689
2 Desviacion estandar	0.4845
3 Varianza	0.2347
4 IQR	1.0000
5 Skewness	0.5436
6 Kurtosis	1.2955

Boxplot

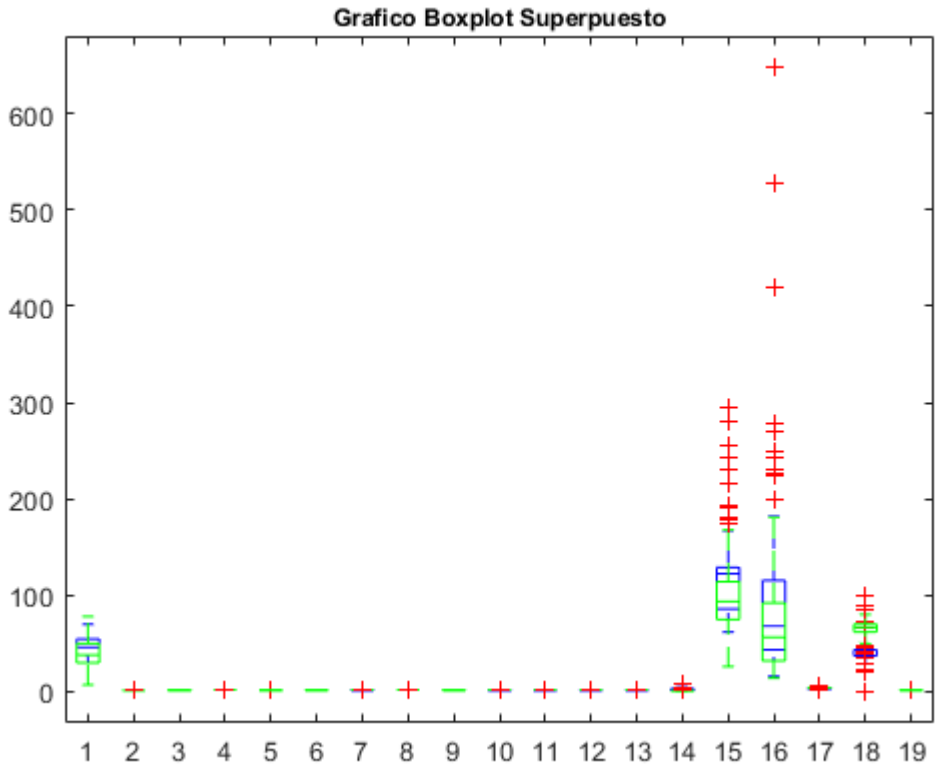
```
figure(1)
boxplot(hepa_c1,"Colors","b");
title("Grafico Boxplot Clase 1");
```




```
figure(2);
boxplot(hepa_c2,"Colors","g");
title("Grafico Boxplot Clase 2");
```



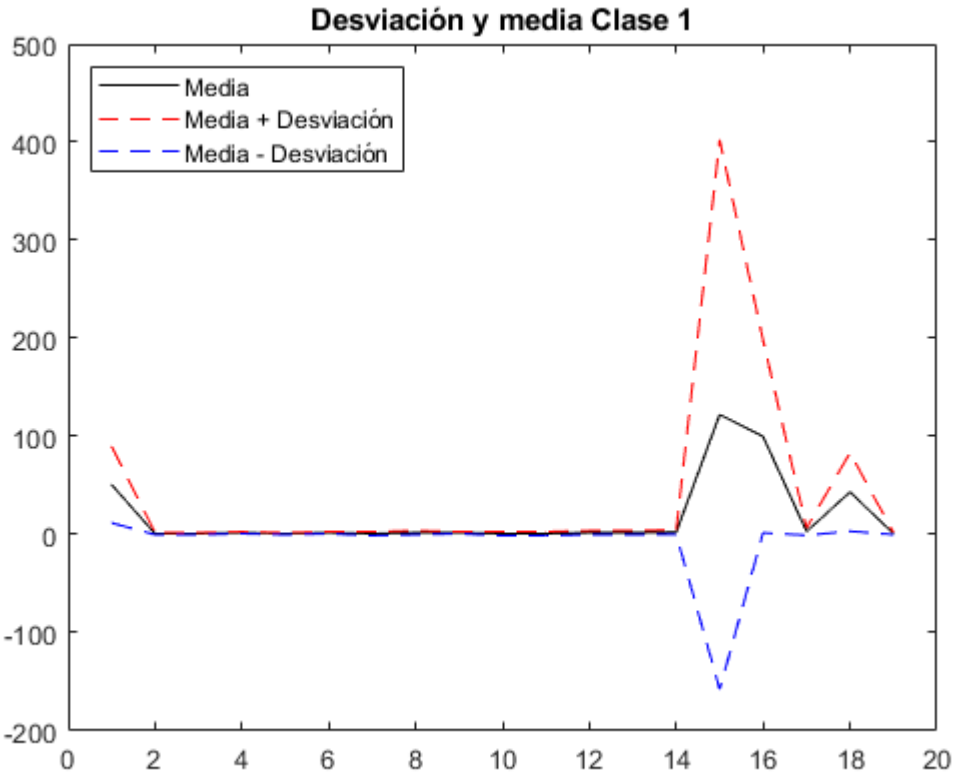

```
figure(3);
boxplot(hepa_c1,"Colors","b"); hold on;
boxplot(hepa_c2,"Colors", "g"); hold off;
title('Grafico Boxplot Superpuesto' ,'FontSize',9)
```



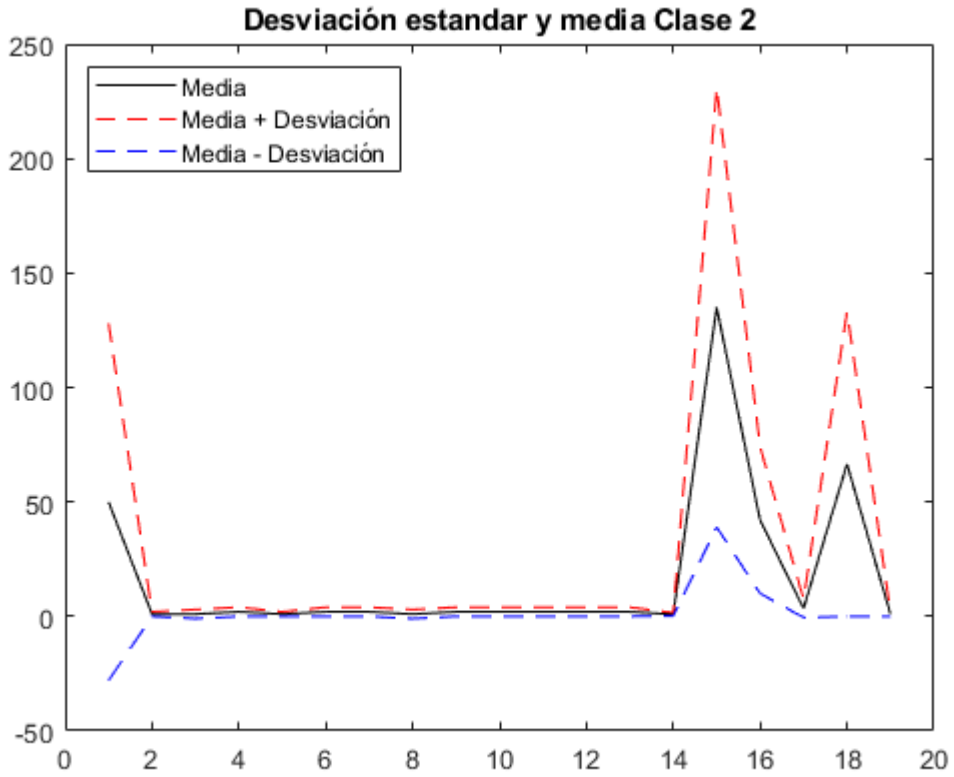
Graficas estadisticas

Desviación estandar y media

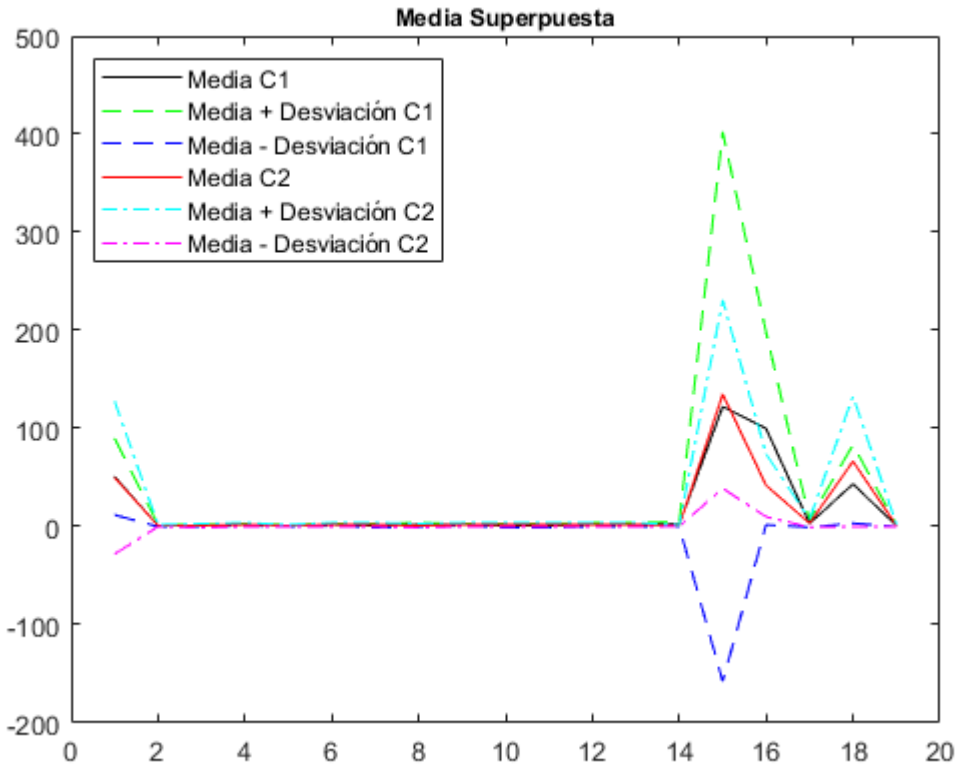
```
figure(4);
plot(1:19,hepa_c1(1,:),"k",1:19,hepa_c1(1,:)+hepa_c1(2,:),"r--",...
    1:19,hepa_c1(1,:)-hepa_c1(2,:),"b--");
title("Desviación y media Clase 1");
legend(["Media", "Media + Desviación", "Media - Desviación"],...
    'Location','northwest');
```




```
figure(5);
plot(1:19,hepa_c2(1,:),"k",1:19,hepa_c2(1,:)+hepa_c2(2,:),"r--",...
    1:19,hepa_c2(1,:)-hepa_c2(2,:),"b--");
title("Desviación estandar y media Clase 2");
legend(["Media", "Media + Desviación", "Media - Desviación"],...
    'Location','northwest');
```

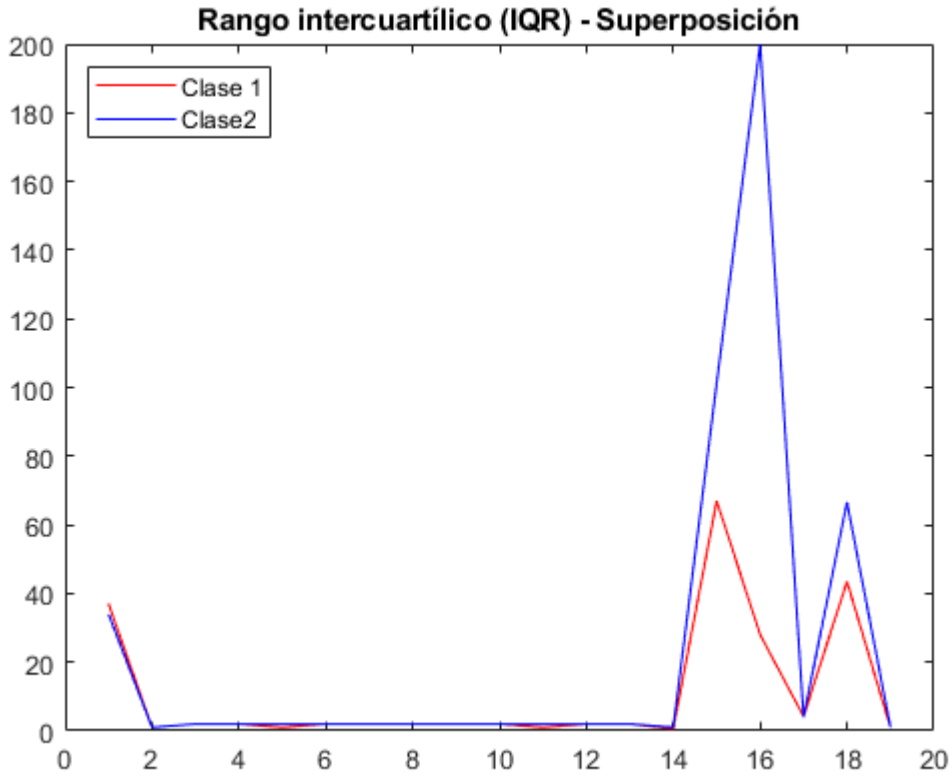



```
figure(6);
plot(1:19,hepa_c1(1,:),"k",1:19,hepa_c1(1,:)+hepa_c1(2,:),"g--",1:19,...
    hepa_c1(1,:)-hepa_c1(2,:),"b--",1:19,hepa_c2(1,:),"r",1:19,...
    hepa_c2(1,:)+hepa_c2(2,:),"c-.",1:19,hepa_c2(1,:)-hepa_c2(2,:),"m-.");
title('Media Superpuesta' ,'FontSize',9);
legend(["Media C1", "Media + Desviación C1", "Media - Desviación C1", ...
    "Media C2", "Media + Desviación C2", "Media - Desviación C2"],...
    'Location','northwest');
```

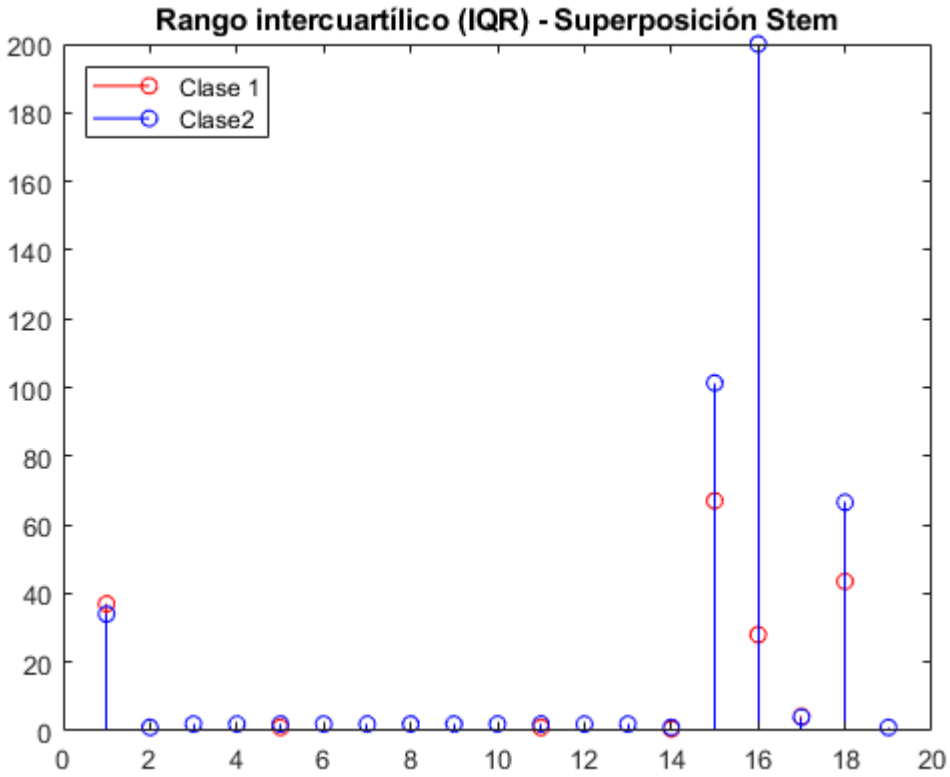


Rango intercuartílico

```
figure(7);
plot(1:19, hepa_c1(4,:),"r",1:19, hepa_c2(4,:),"b");
title("Rango intercuartílico (IQR) - Superposición");
legend(["Clase 1", "Clase2"],"Location", "northwest")
```

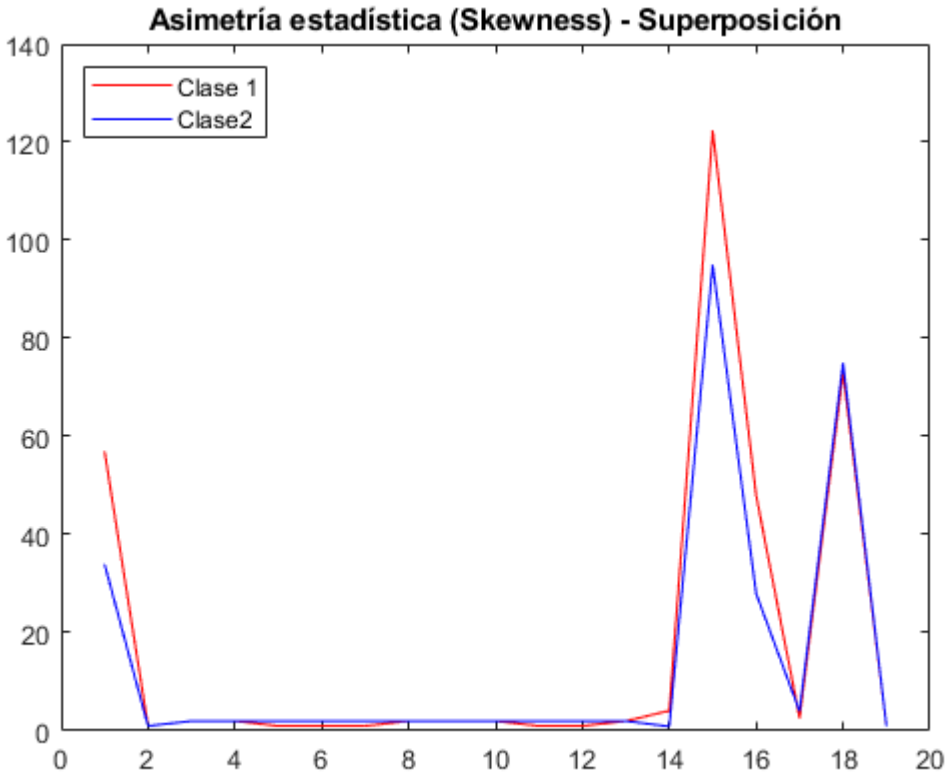



```
figure(8);
stem(1:19, hepa_c1(4,:),"r");
hold on;
stem(1:19, hepa_c2(4,:),"b");
hold off;
title("Rango intercuartílico (IQR) - Superposición Stem");
legend(["Clase 1", "Clase2"],"Location", "northwest")
```

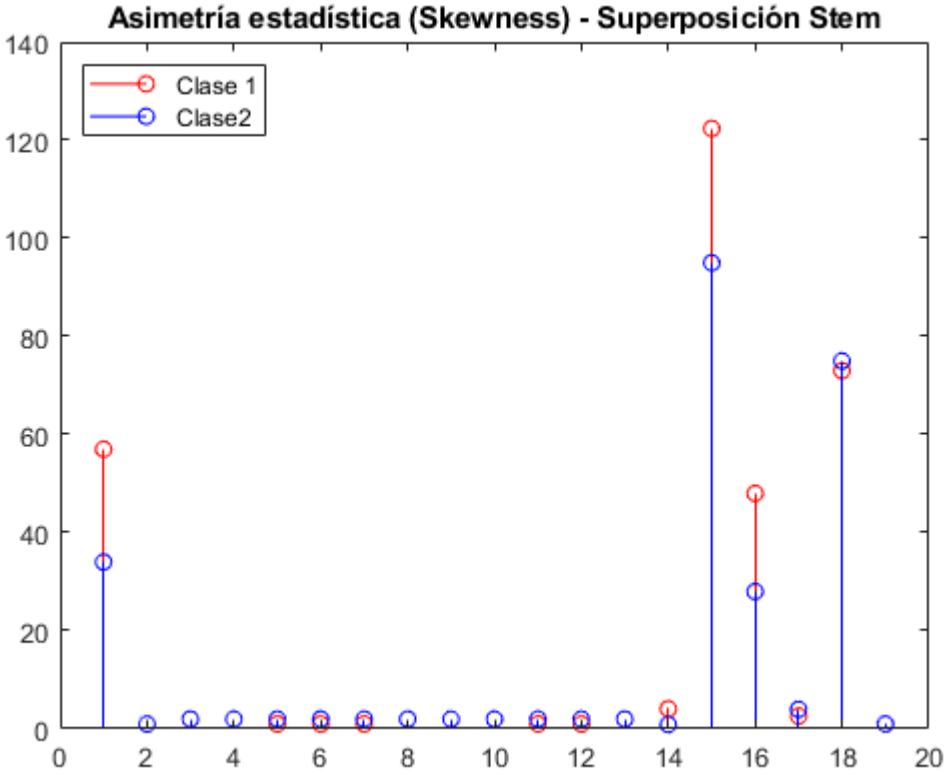


Asimetría estadística (Skewness)

```
figure(9);
plot(1:19, hepa_c1(5,:),"r",1:19, hepa_c2(5,:),"b");
title("Asimetría estadística (Skewness) - Superposición");
legend(["Clase 1", "Clase2"],"Location", "northwest")
```

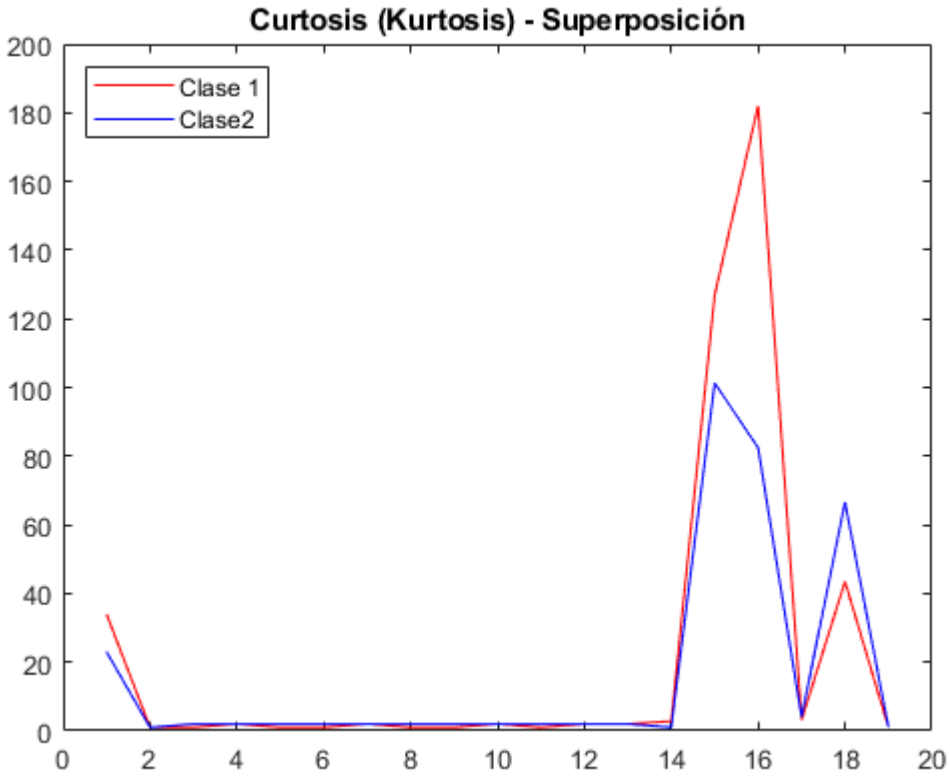



```
figure(10);
stem(1:19, hepa_c1(5,:),"r");
hold on;
stem(1:19, hepa_c2(5,:),"b");
hold off;
title("Asimetría estadística (Skewness) - Superposición Stem");
legend(["Clase 1", "Clase2"],"Location", "northwest")
```

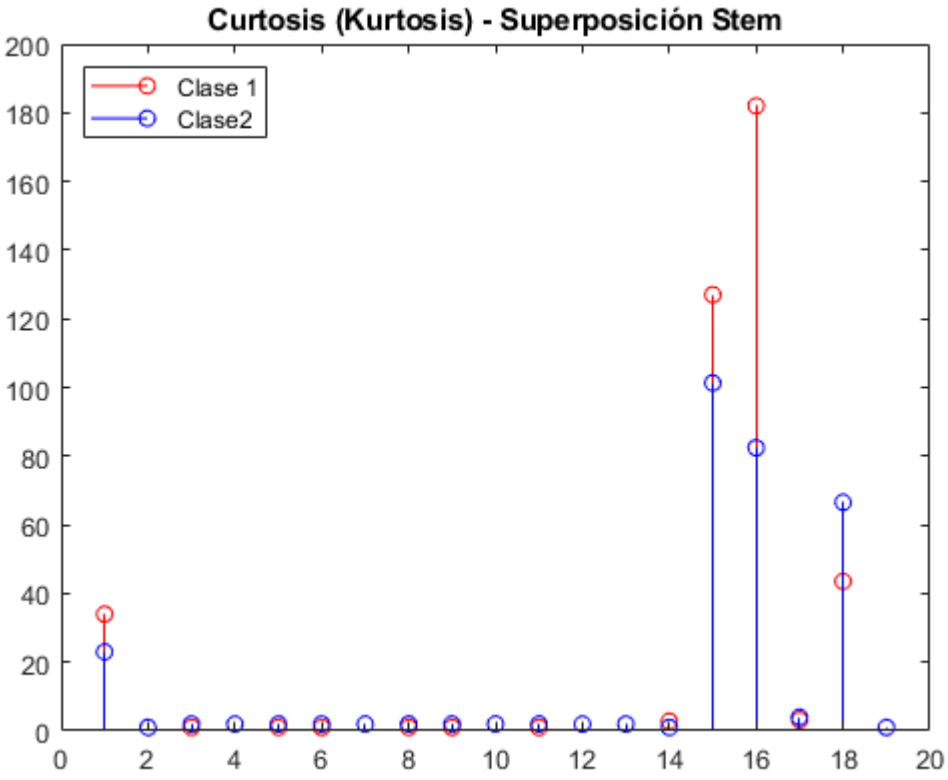


Curtosis (Kurtosis)

```
figure(11);
plot(1:19, hepa_c1(6,:),"r",1:19, hepa_c2(6,:),"b");
title("Curtosis (Kurtosis) - Superposición");
legend(["Clase 1", "Clase2"],"Location", "northwest")
```




```
figure(12);
stem(1:19, hepa_c1(6,:),"r");
hold on;
stem(1:19, hepa_c2(6,:),"b");
hold off;
title("Curtosis (Kurtosis) - Superposición Stem");
legend(["Clase 1", "Clase2"],"Location", "northwest")
```


Curtosis (Kurtosis) - Superposición Stem
Clase 1
Clase2
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
14
16
18
20