Homework 5

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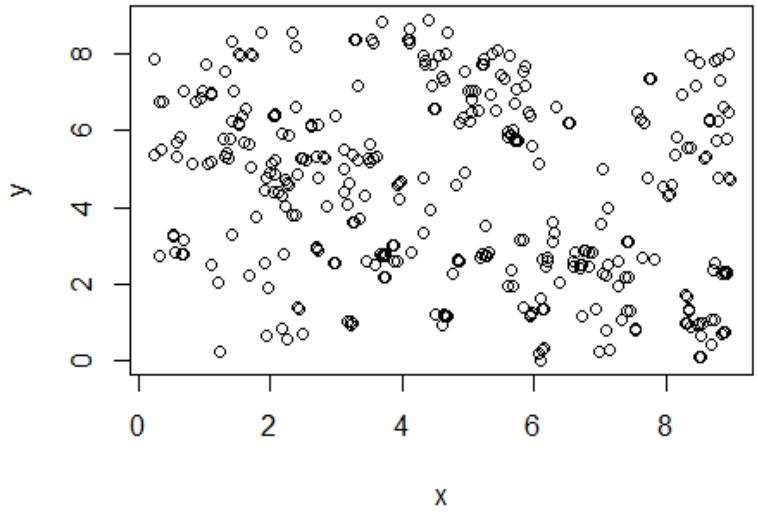
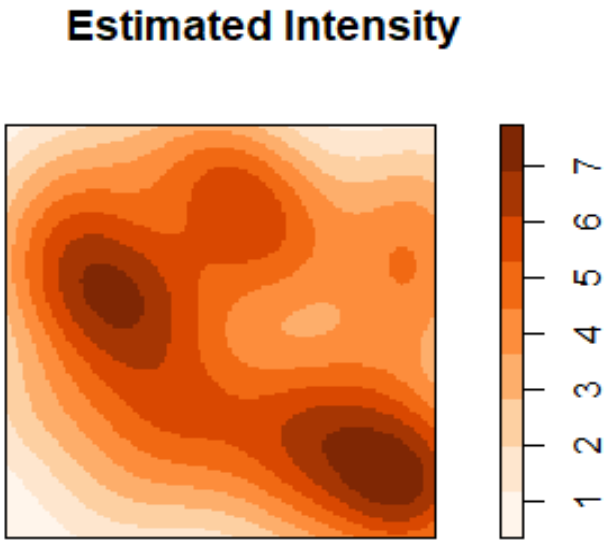
2)

a)

```
canes <- ppp(x, y, window=owin(c(0,9),c(0,9)))
#a plot of the data
plot(x = x, y = y)
```



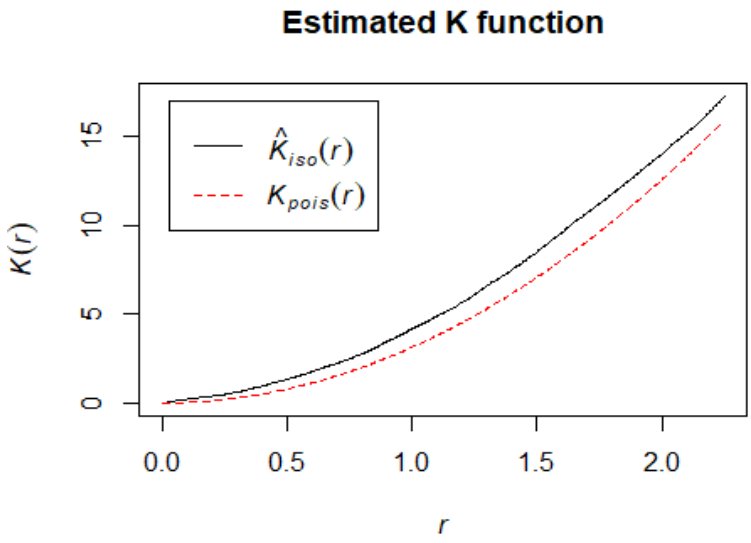

```
#plot of the density using Diggle's Bandwidth
image(density(canes, diggle=T), main = "Estimated Intensity", col = brewer.pal(n = 9, name = "Oranges"))
```



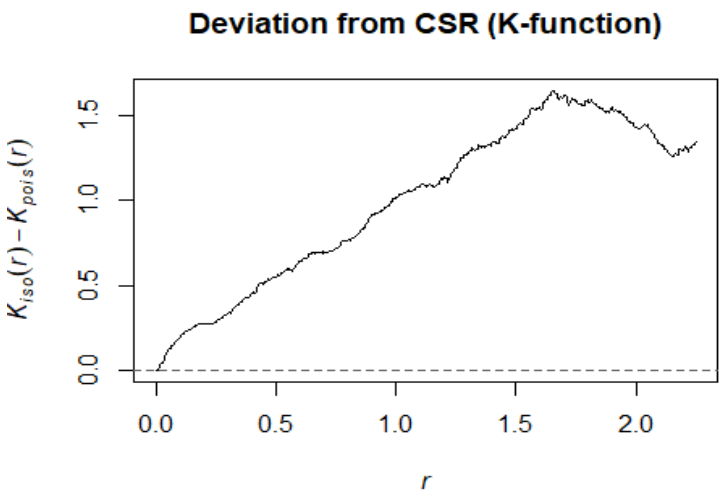
It appears there may be some clustering based on the plot of the intensity, but the plot of the original data is inconclusive.

b)

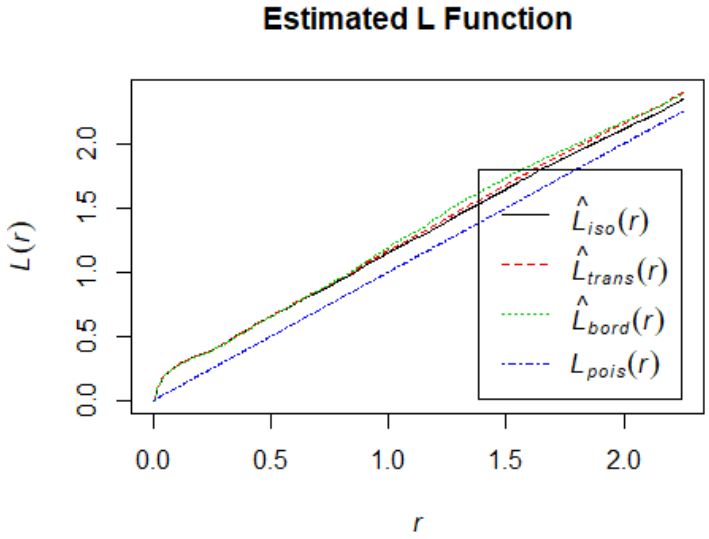
```
#K-function
Kc <- Kest(canes, correction="Ripley")
plot(Kc, main="Estimated K function")
```



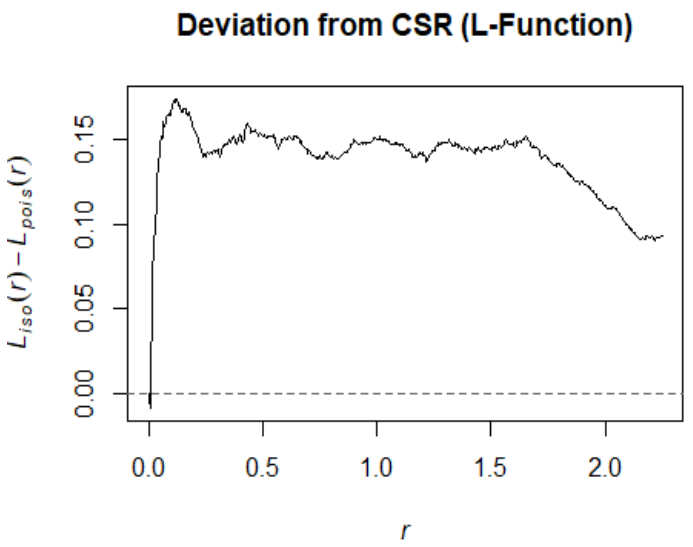

```
plot(Kc,  iso - theo ~ r, main="Deviation from CSR (K-function)")
abline(h=0, lty=2, col="gray40")
```




```
#L-function
Lc <- Lest(canes)
plot(Lc, main = "Estimated L Function")
```



```
plot(Lc,  iso - theo ~ r, main="Deviation from CSR (L-Function)")
abline(h=0, lty=2, col="gray40")
```

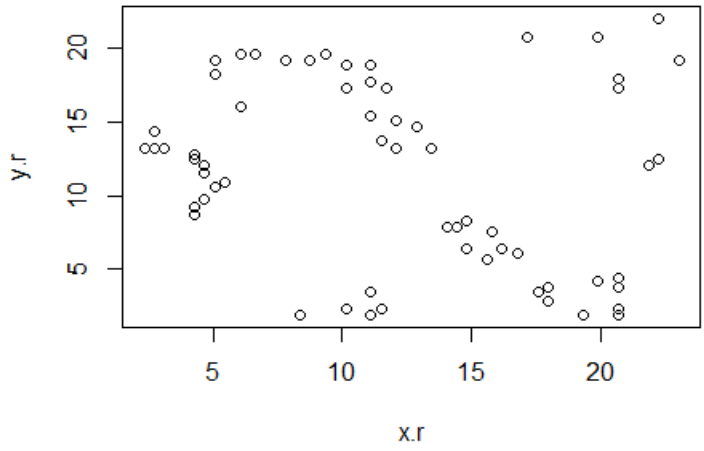


Both the K- and L- functions have positive values near 0, indicating that the plot is clustered. However, note that the deviation from CSR for the L- function is actually less than 0 for very small distance from origin, which indicates that this process may not actually be clustered.

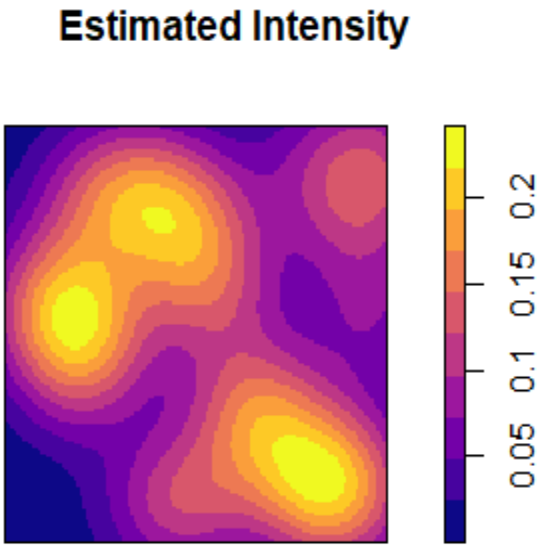
3)

a)

```
trees <- ppp(x.r, y.r, window=owin(c(0,23),c(0,23)))
#a plot of the data
plot(x = x.r, y = y.r)
```

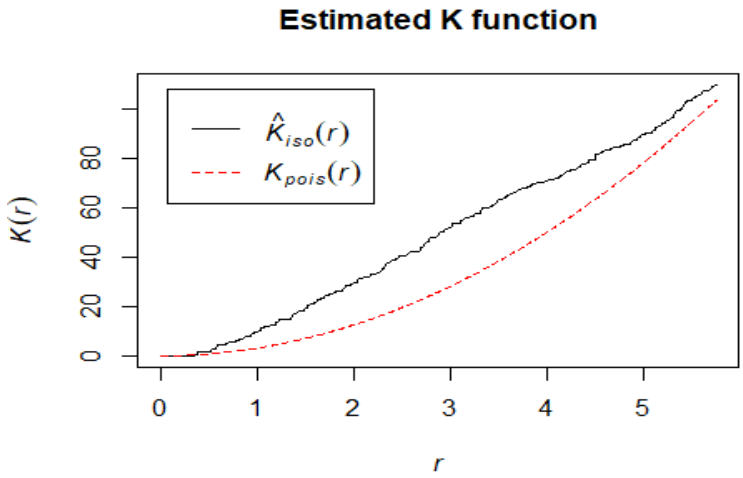



```
#plot of the density
plot(density(trees, diggle=T), main = "Estimated Intensity", col = plasma(10))
```

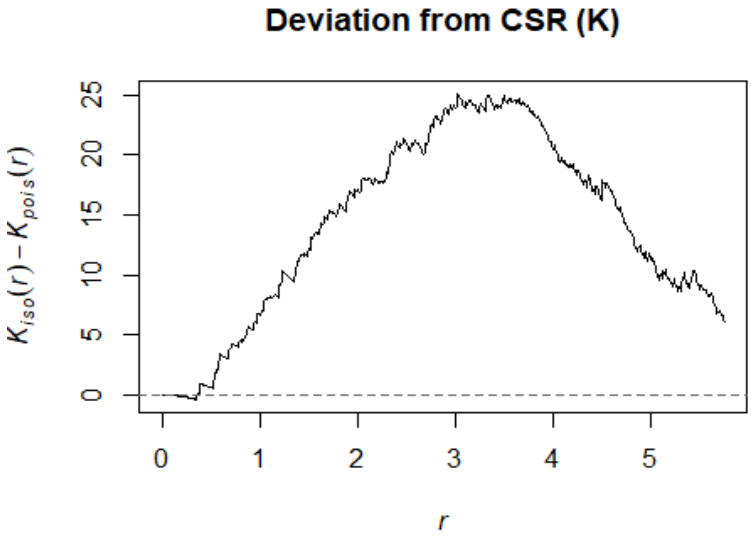


b)

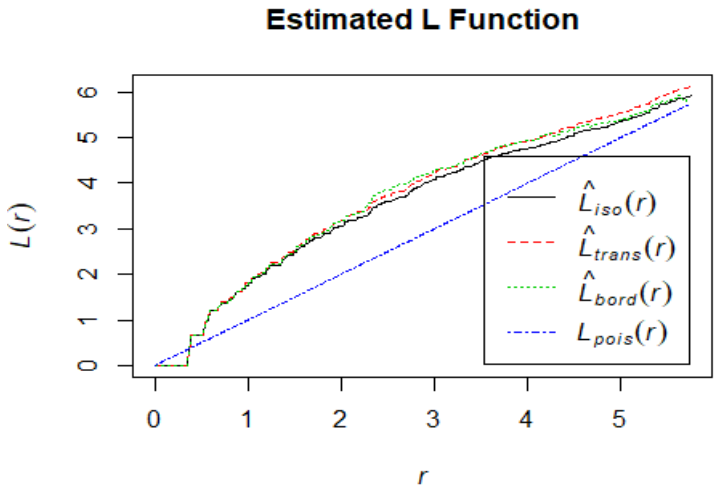
```r
#K-function
Ks <- Kest(trees, correction="Ripley")
plot(Ks, main="Estimated K function")
```



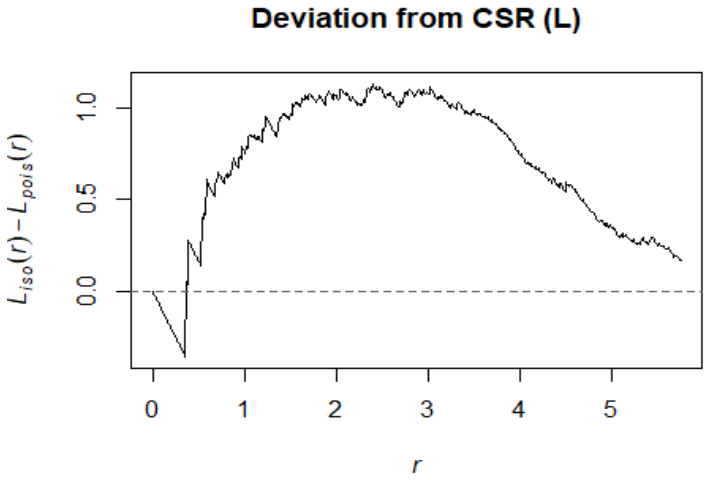

```r
plot(Ks,  iso - theo ~ r, main="Deviation from CSR (K)")
abline(h=0, lty=2, col="gray40")
```



```r
#L-function
Ls <- Lest(trees)
plot(Ls, main = "Estimated L Function")
```




```r
plot(Ls,  iso - theo ~ r, main="Deviation from CSR (L)")
abline(h=0, lty=2, col="gray40")
```



While our intuition suggests that this process should be clustered around trees, the K- and L-functions and actually negative near 0, indicating that this process is actually somewhat regular/unclustered.