Density Estimation 2

GMM. DBSCAN

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2023-10-03

```
load("BikeDay.Rdata")
X <- as.matrix(day[day$yr==1,c(10,14)])
#pairs(X)
```

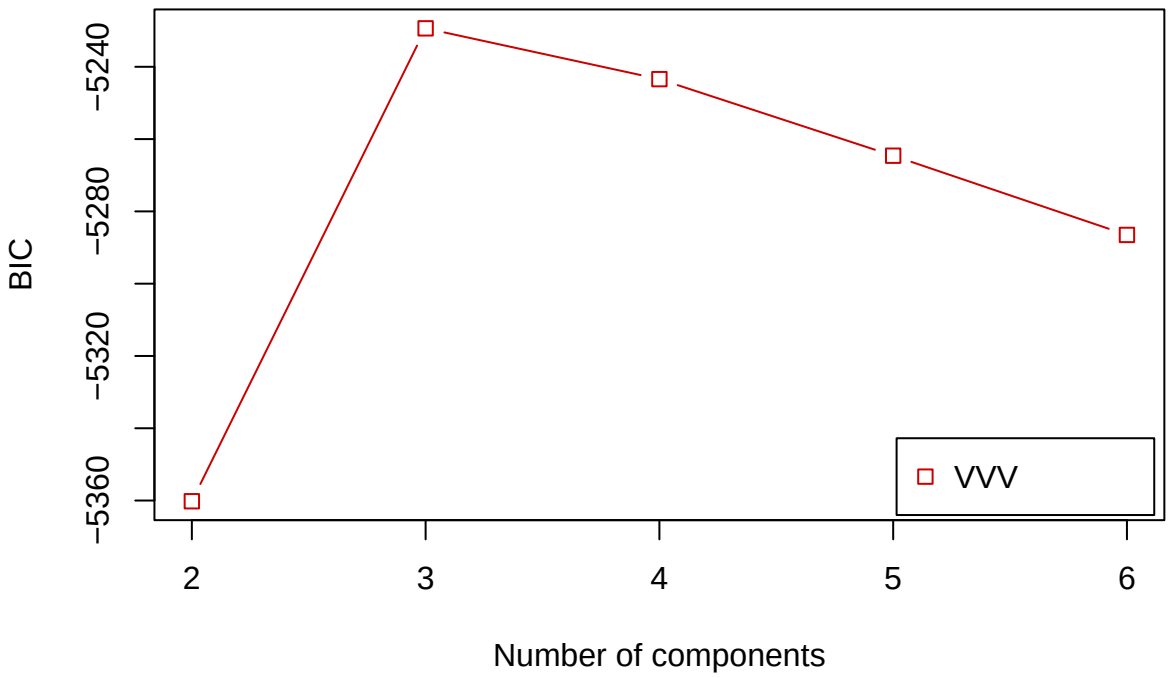
Questions

1.

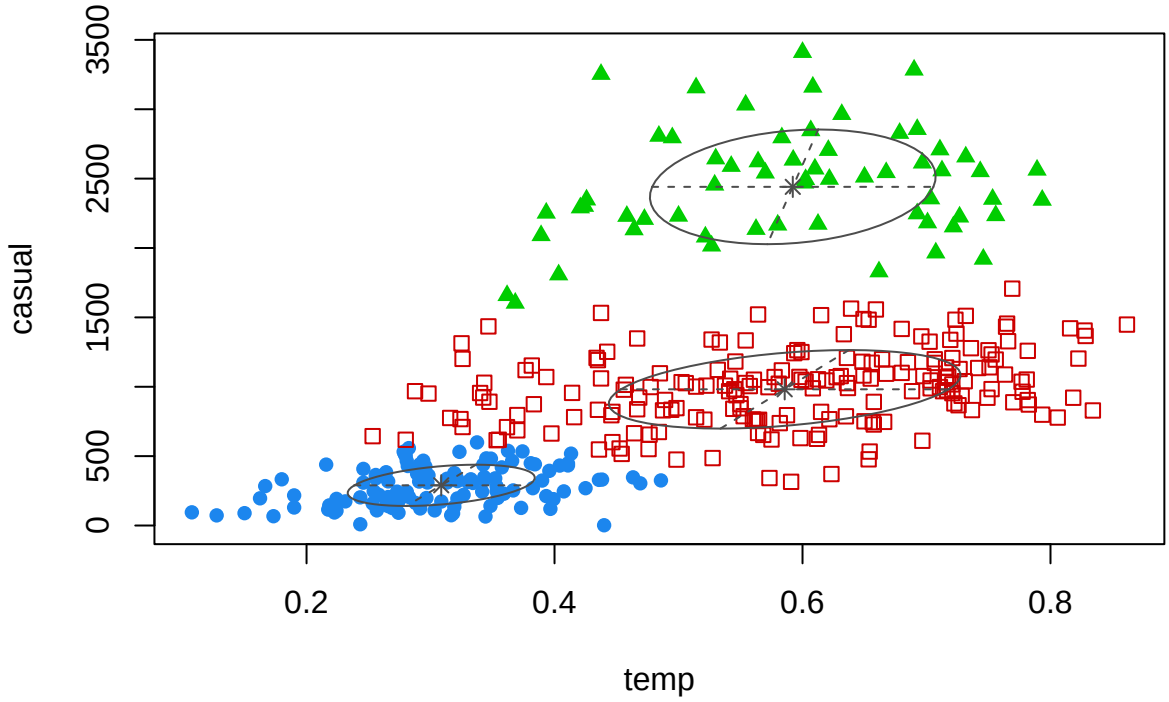
```
GMM_BIC <- Mclust(X,G=2:6, modelNames="VVV")
summary(GMM_BIC, parameters=F)
```

```
## ----------------------------------------------------
## Gaussian finite mixture model fitted by EM algorithm
## ----------------------------------------------------
##
## Mclust VVV (ellipsoidal, varying volume, shape, and orientation) model with 3
## components:
##
##  log-likelihood   n df       BIC       ICL
##       -2564.509 366 17 -5229.362 -5261.588
##
## Clustering table:
##   1   2   3
## 111 195  60
```

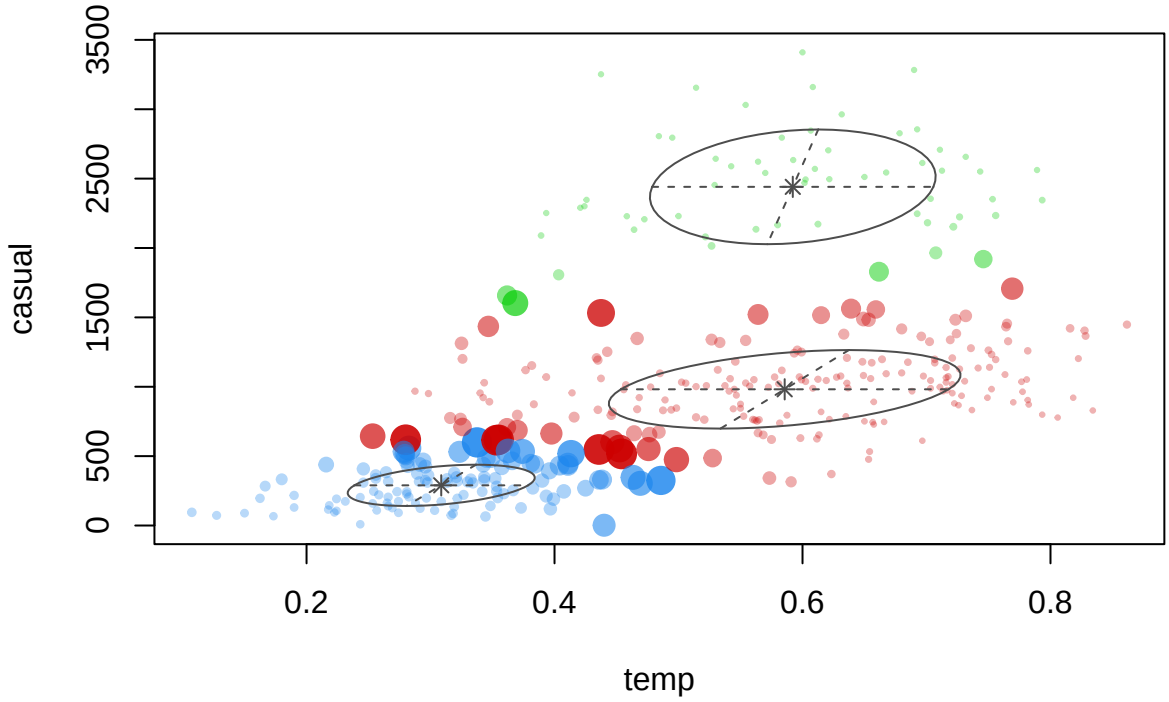
```
plot(GMM_BIC, what="BIC")
```



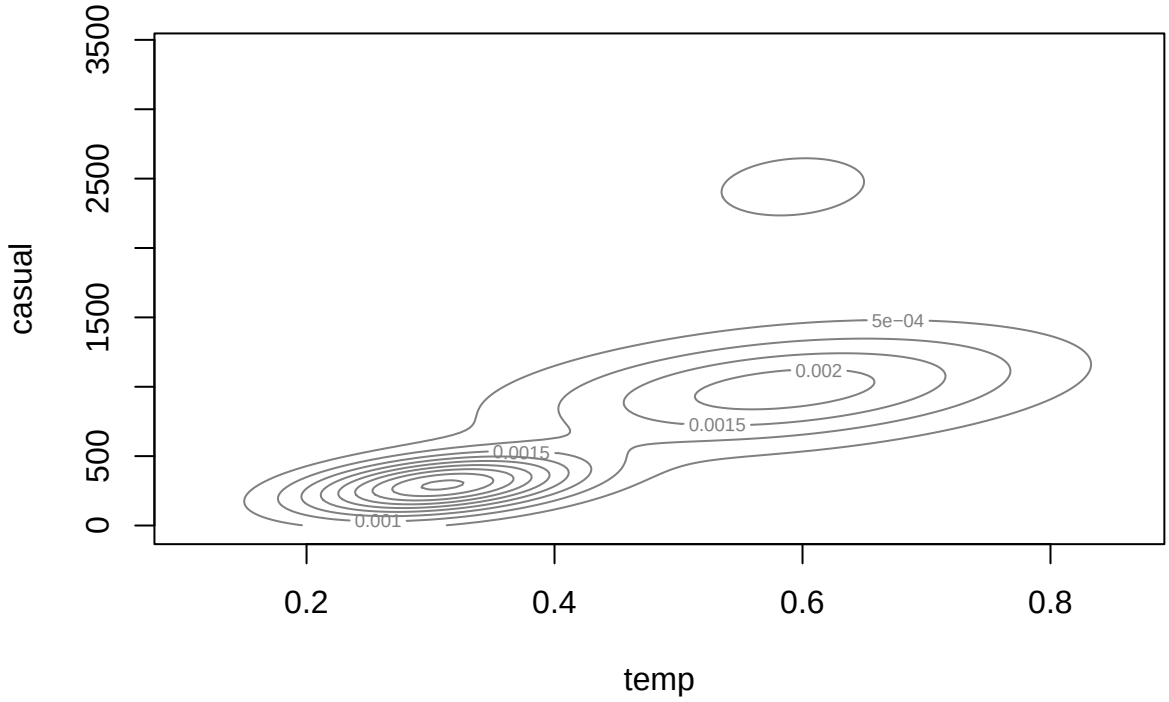

```
plot(GMM_BIC, what="classification")
```




```
plot(GMM_BIC, what="uncertainty")
```

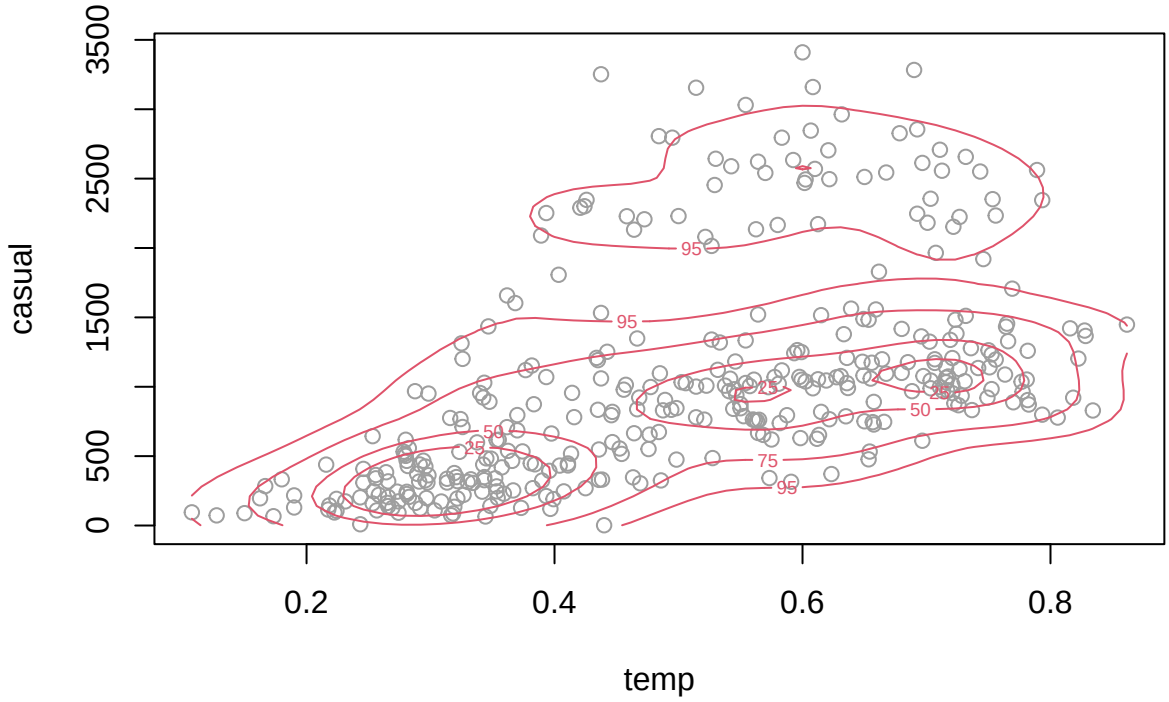



```
plot(GMM_BIC, what="density")
```



2.

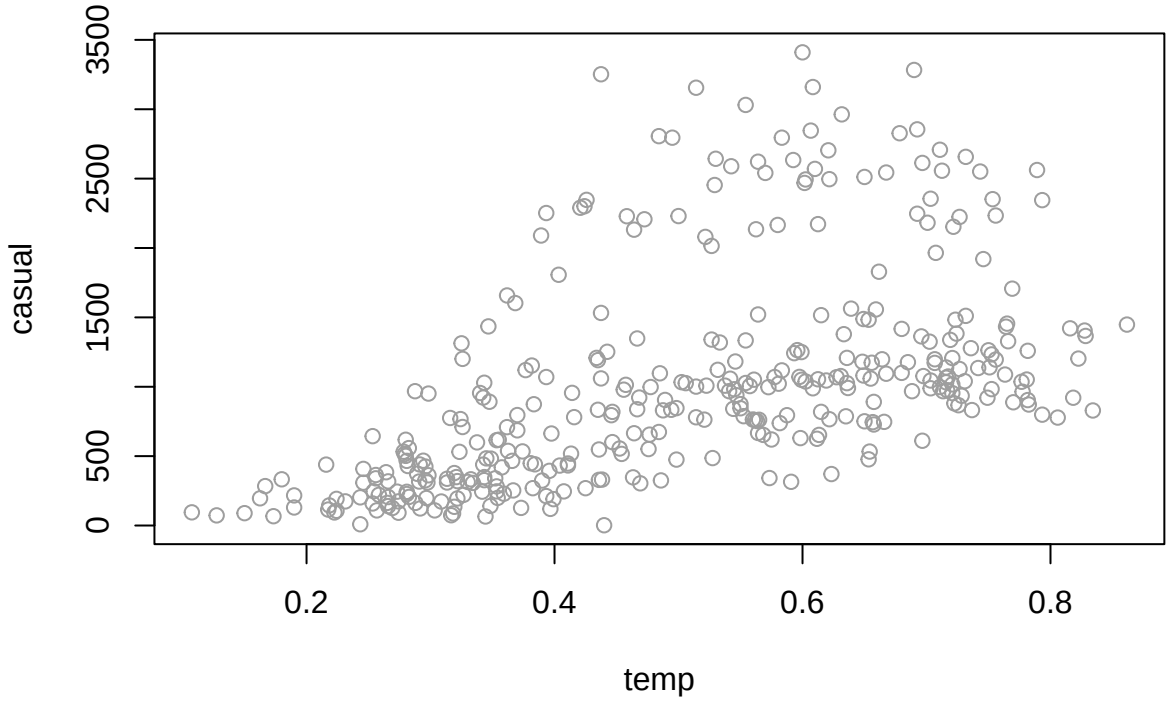
```
#?sm.density

a = 0.25

plot(X, col=8)
sm.density(X,h=a*c(sd(day$temp), sd(day$casual)),
           display="slice",col=2, props=c(25,50,75,95), add=TRUE)
```




```
# default props -> c(75,50,25)
```

3.

```
plot(X, col=8)
```




```
a = 0.4
```

4.

```
#?fpc
```

5.

6.

```
#?fpc::dbscan  / ?dbscan::dbscan
```

7.