

# ProjetMAD

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## Exercise 1 Simulation

### 1.1 Simulate sample of 1000 vectors from a 2 dimensional mixture with 2 components

nents

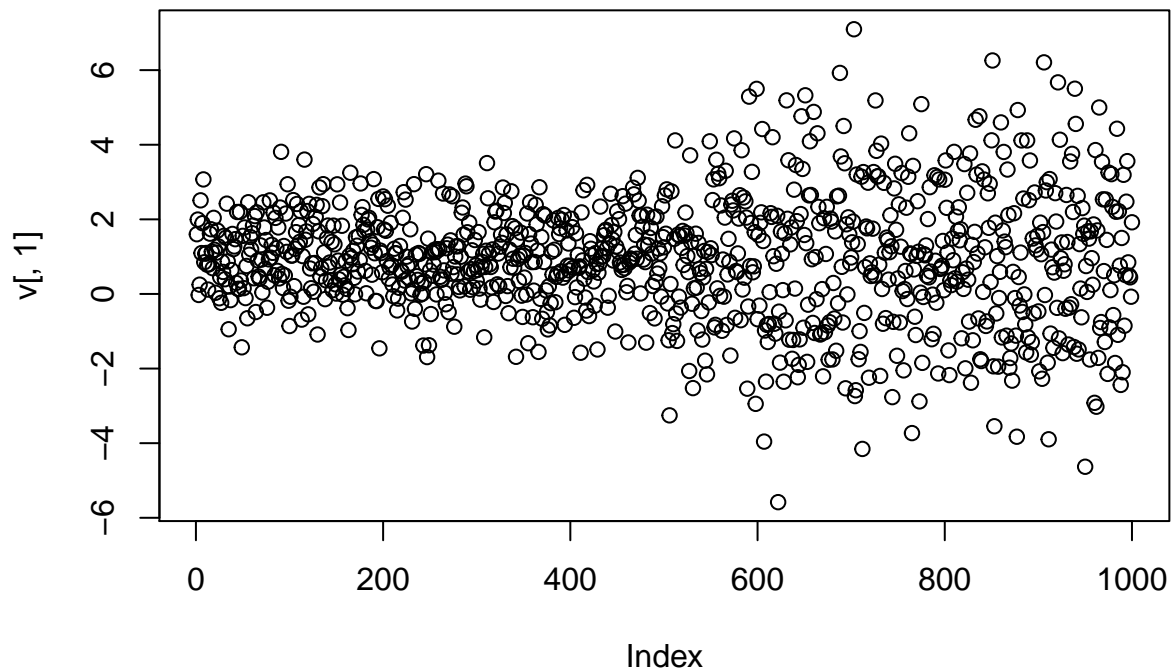
```
set.seed(123)
library(MASS)

v1 <- mvrnorm(500,mu = c(1,2), Sigma=diag(2))
v2 <- mvrnorm(500,mu = c(1,2), Sigma=4*diag(2))

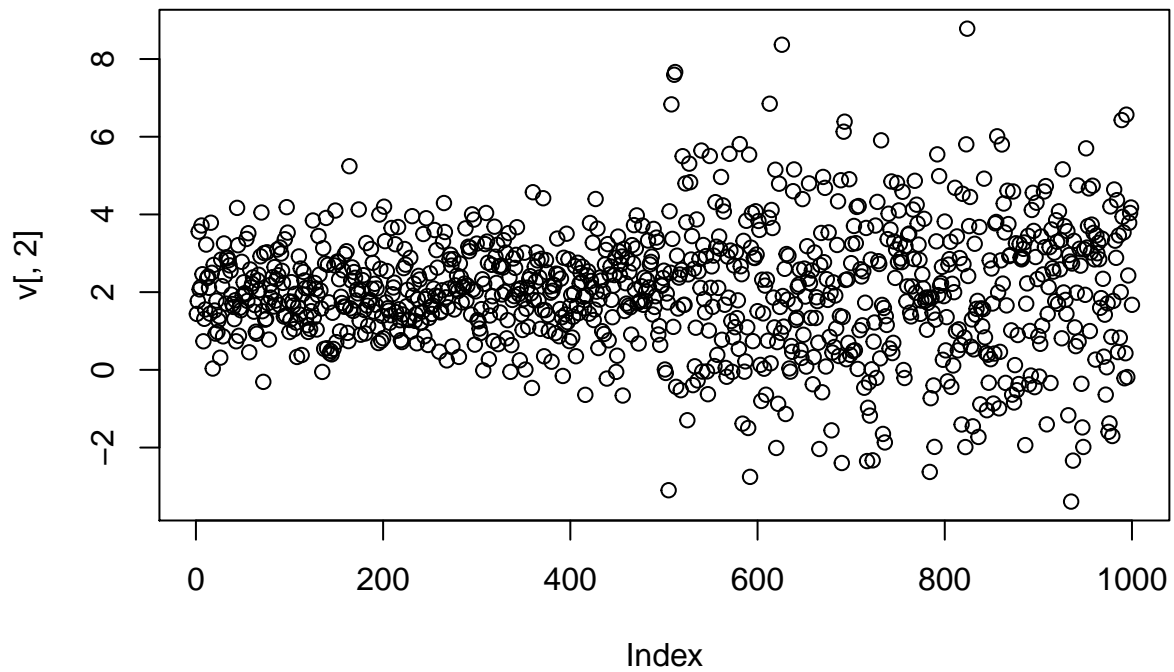
v <- rbind(v1,v2)
x <- c(v1,v2)
```

### 1.2

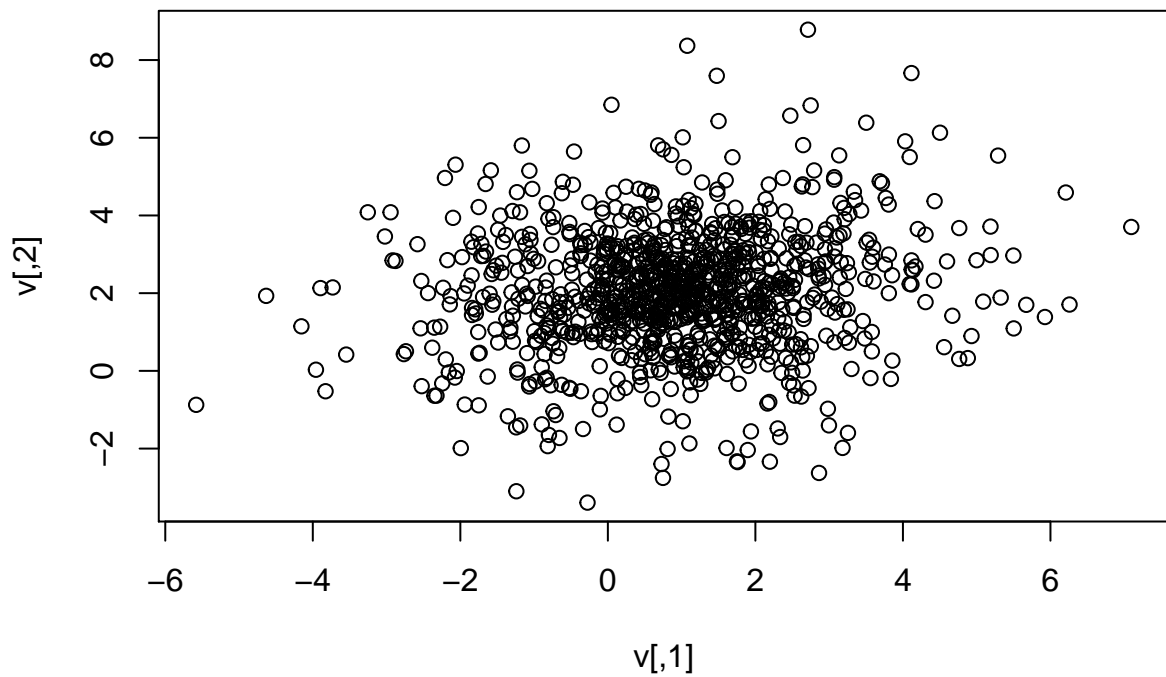
```
plot(v[,1])
```



```
plot(v[,2])
```



```
plot(v)
```



```
##
```

1.3

```
library(mclust)
```

```
## Warning: package 'mclust' was built under R version 3.4.4
```

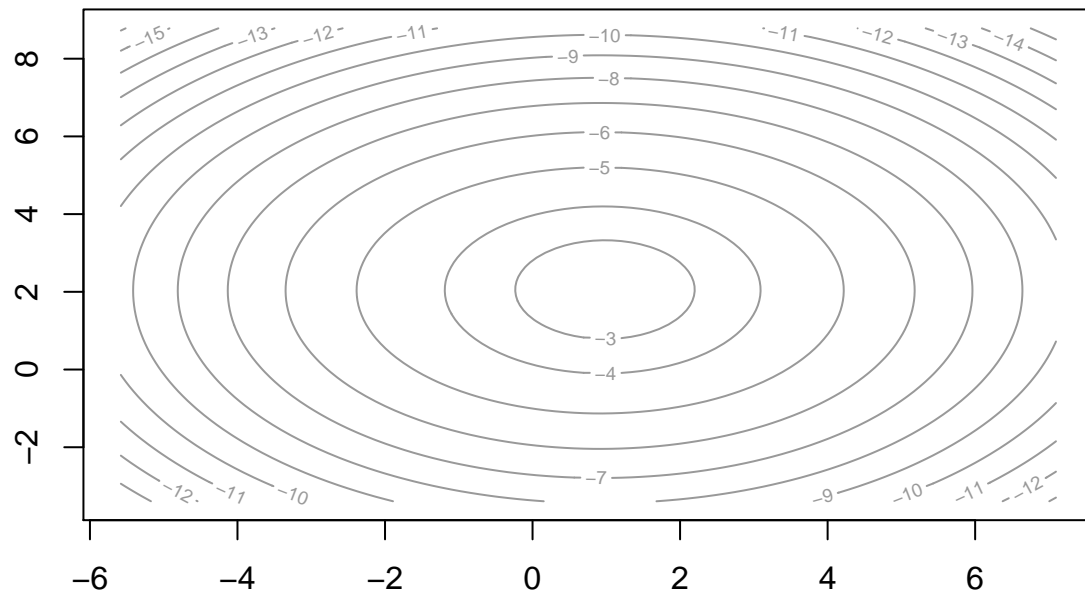
```
## Package 'mclust' version 5.4.1
```

```
## Type 'citation("mclust")' for citing this R package in publications.
```

```
VVI = Mclust(v, modelNames = "VVI")
```

```
plot(VVI, what = c("density"))
```

## log Density Contour Plot



# Exercise 2