

# Checking FlashLOL

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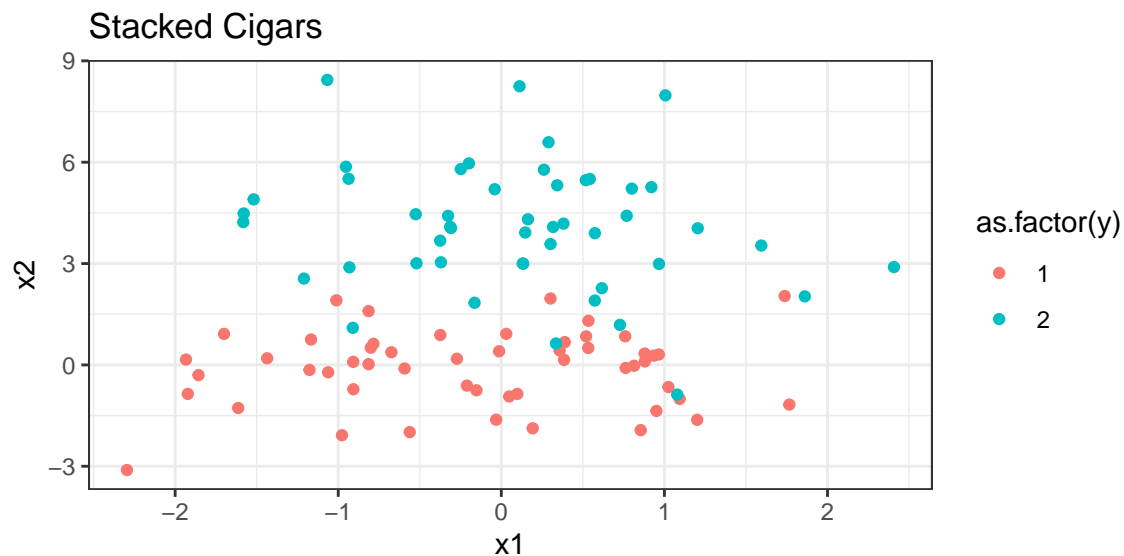
*January 16, 2020*

```
require(lolR)
require(tidyverse)
require(ggplot2)
sim.results <- readRDS('./flashx_sims.rds')
```

## Stacked Cigars

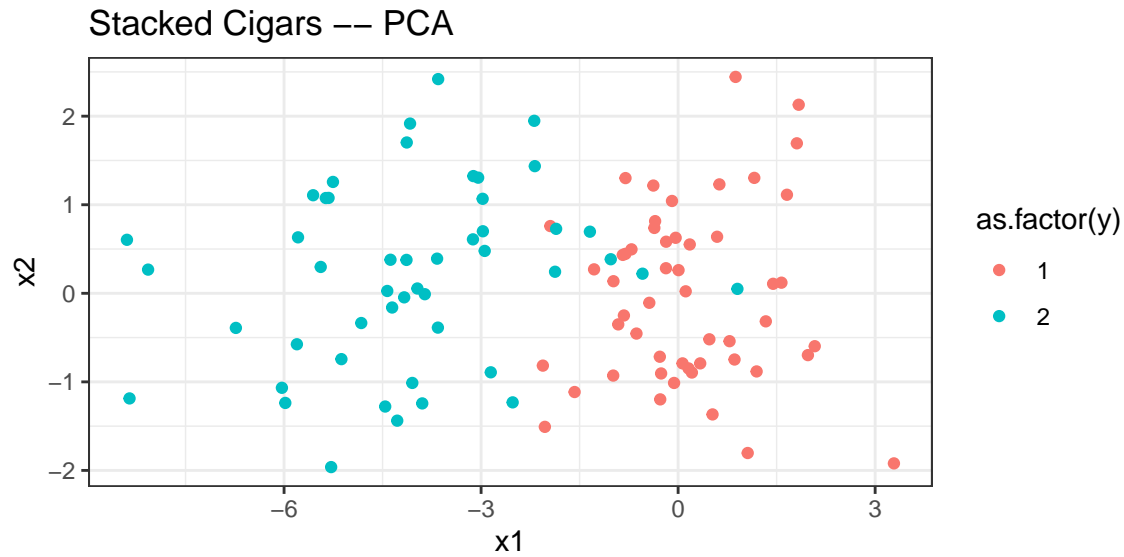
### Simulation

```
dat <- sim.results$cig$sim
data.frame(x1=dat$X[,1], x2=dat$X[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Stacked Cigars") +
  theme_bw()
```



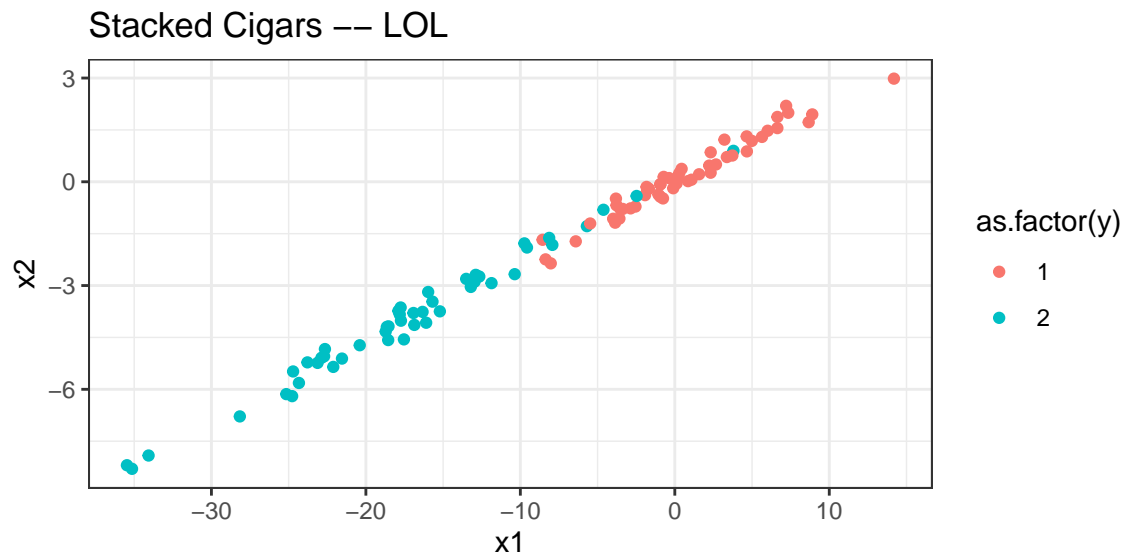
### PCA

```
res <- sim.results$cig$pca
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Stacked Cigars -- PCA") +
  theme_bw()
```



## LOL

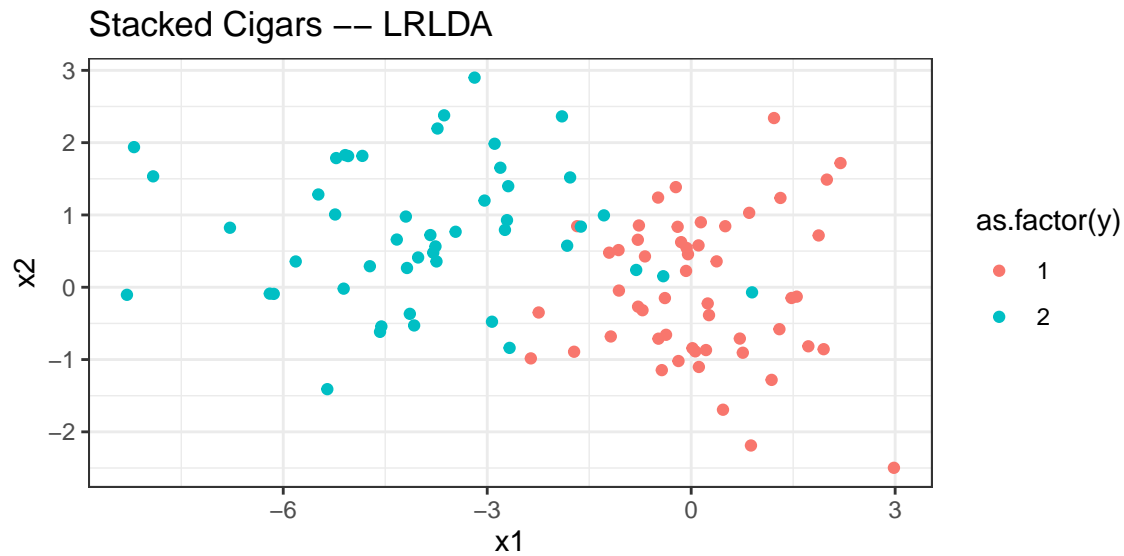
```
res <- sim.results$cig$lol
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Stacked Cigars -- LOL") +
  theme_bw()
```



## LRLDA

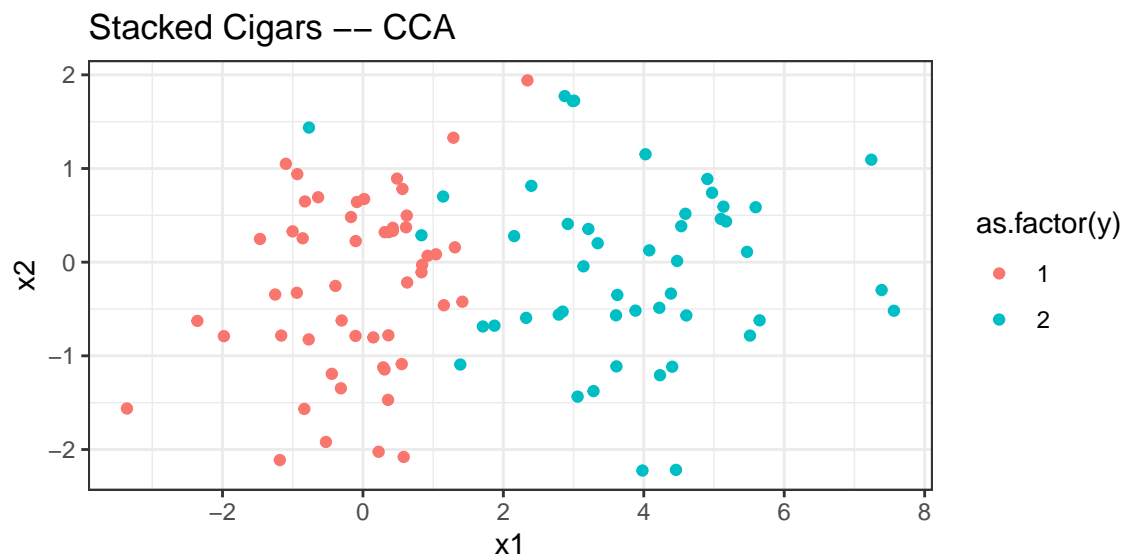
```
res <- sim.results$cig$lrllda
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
```

```
ggtitle("Stacked Cigars -- LRLDA") +  
theme_bw()
```



## CCA

```
res <- sim.results$cig$cca  
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%  
ggplot(aes(x=x1, y=x2, color=as.factor(y))) +  
geom_point() +  
ggtitle("Stacked Cigars -- CCA") +  
theme_bw()
```



## RP

```
res <- sim.results$cig$rp
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Stacked Cigars -- RP") +
  theme_bw()
```

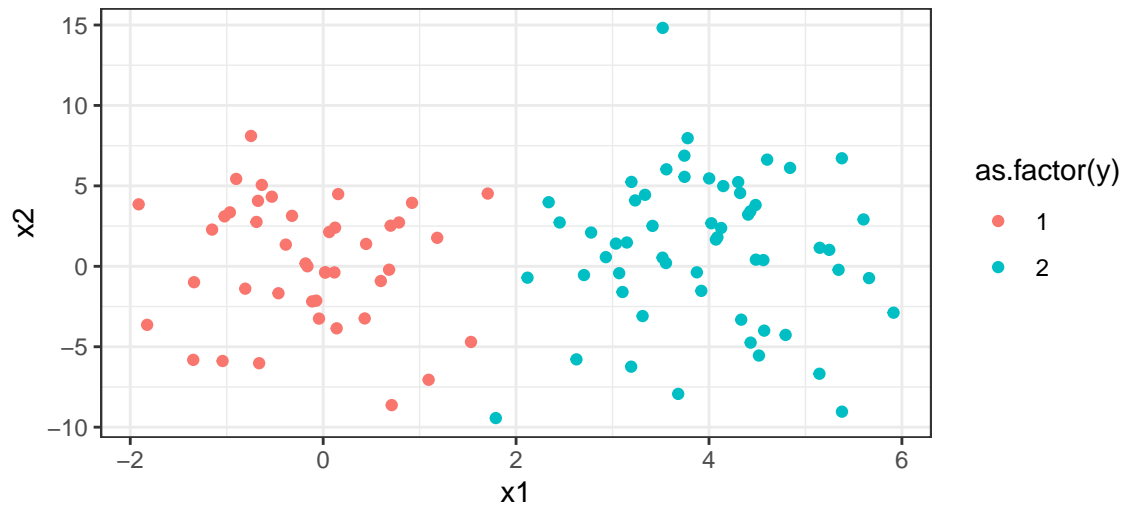


## Horizontal Cigars

### Simulation

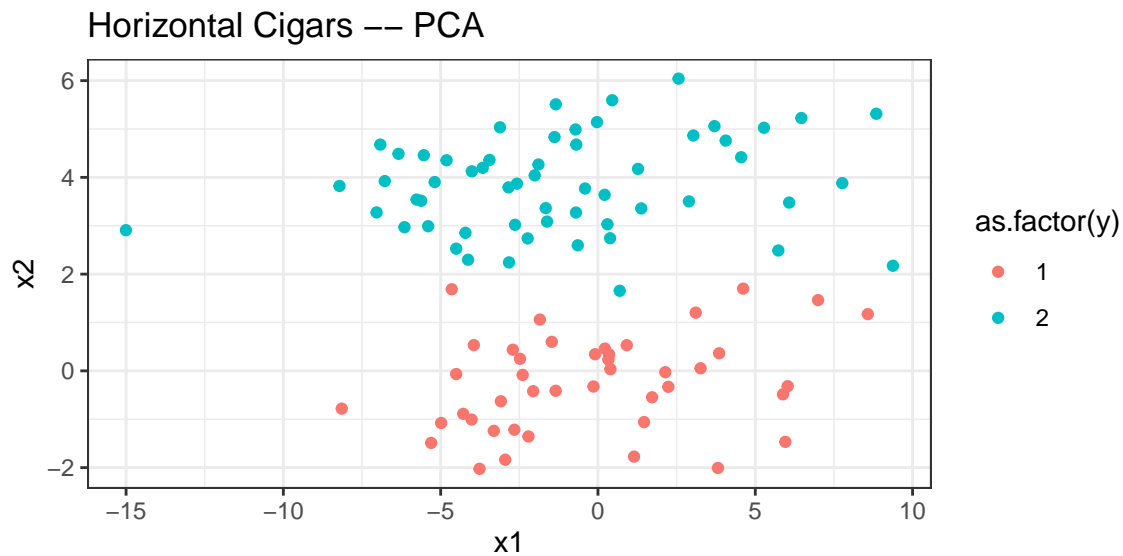
```
dat <- sim.results$hcig$sim
data.frame(x1=dat$X[,1], x2=dat$X[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Horizontal Cigars") +
  theme_bw()
```

## Horizontal Cigars



## PCA

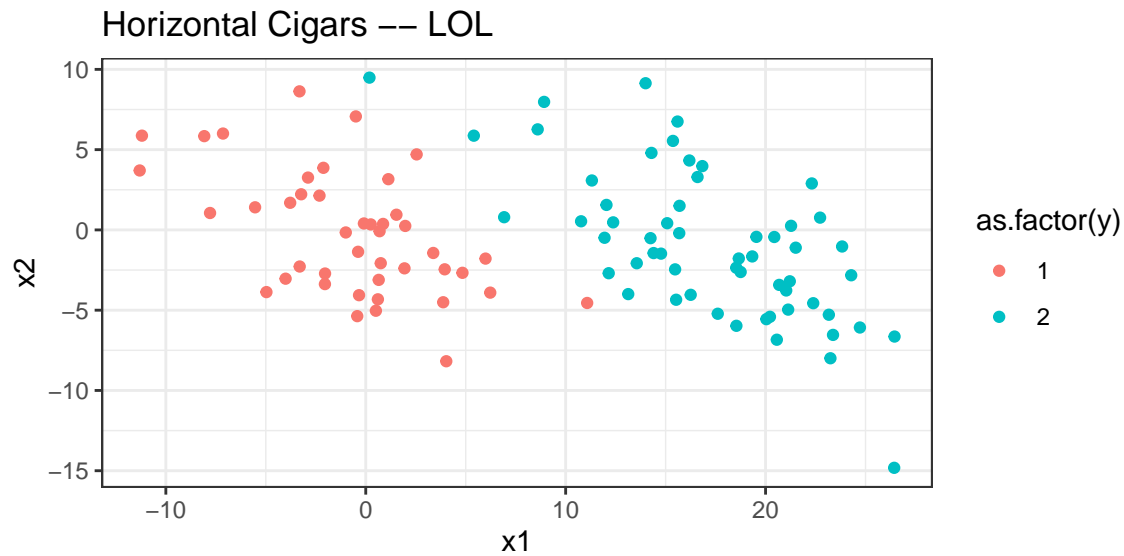
```
res <- sim.results$hcig$pca
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Horizontal Cigars -- PCA") +
  theme_bw()
```



## LOL

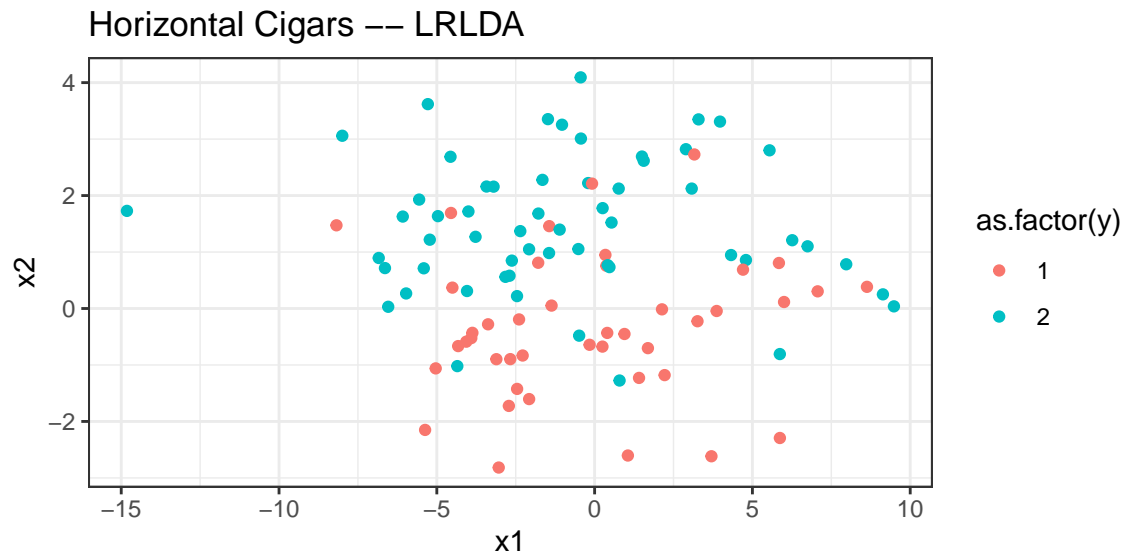
```
res <- sim.results$hcig$lol
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
```

```
ggtitle("Horizontal Cigars -- LOL") +  
theme_bw()
```



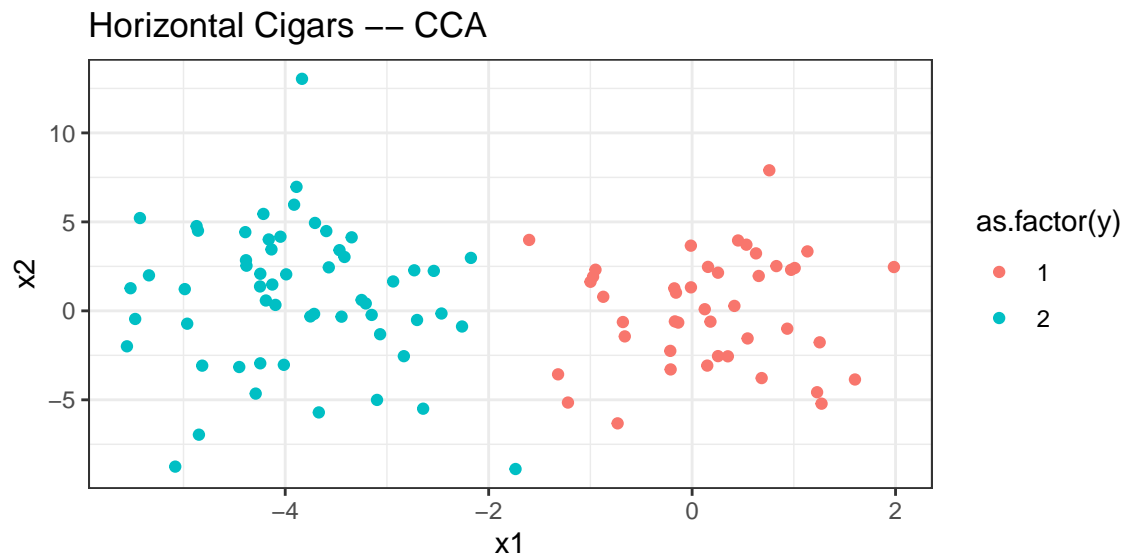
## LRLDA

```
res <- sim.results$hcig$lrllda  
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%  
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +  
  geom_point() +  
  ggtitle("Horizontal Cigars -- LRLDA") +  
  theme_bw()
```



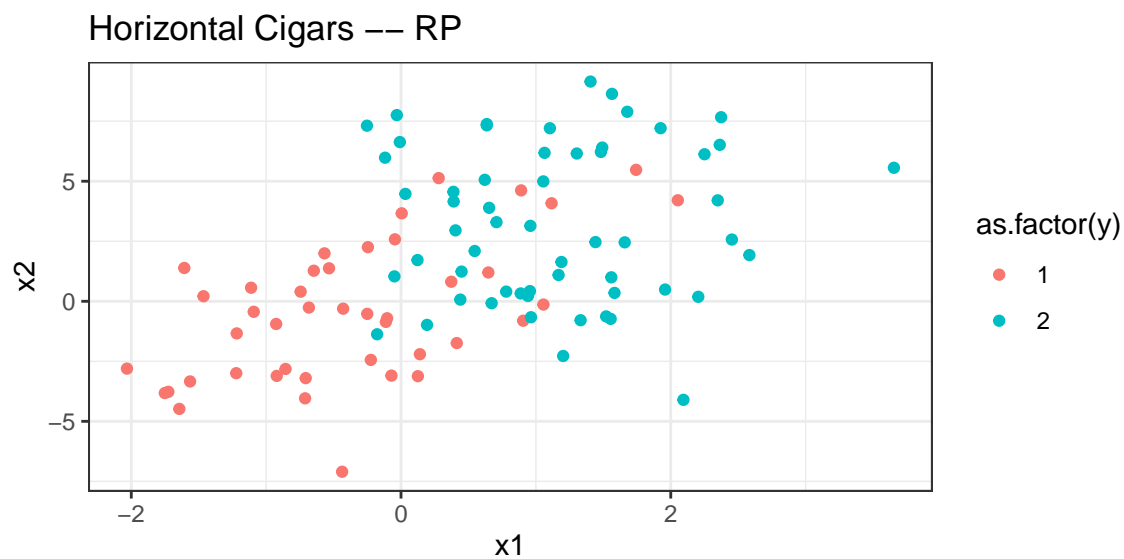
## CCA

```
res <- sim.results$hcig$cca
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Horizontal Cigars -- CCA") +
  theme_bw()
```



RP

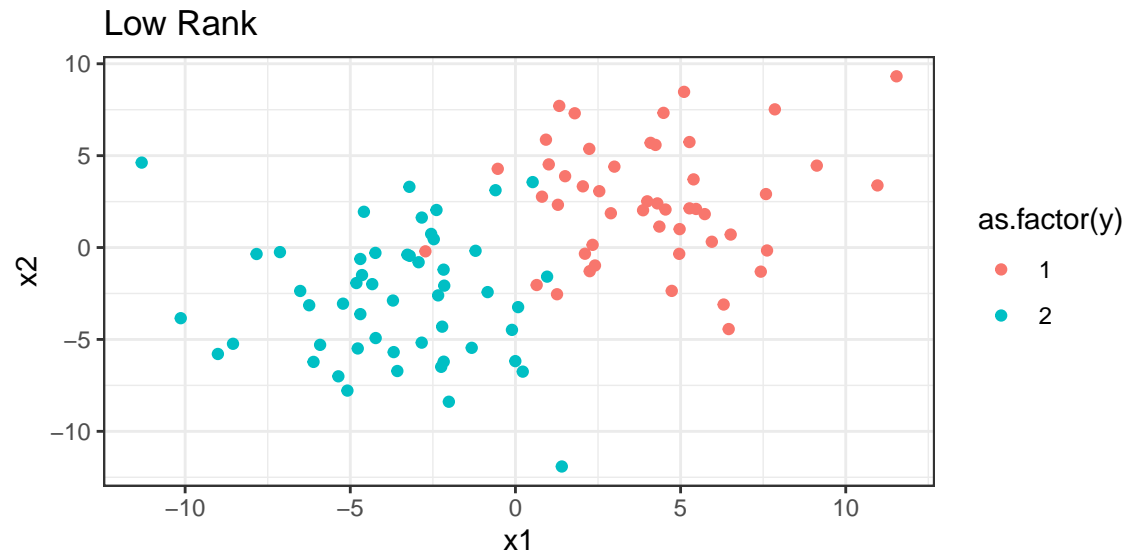
```
res <- sim.results$hcig$rp
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Horizontal Cigars -- RP") +
  theme_bw()
```



## Low-Rank Case

### Simulation

```
dat <- sim.results$lowrank$sim
data.frame(x1=dat$X[,1], x2=dat$X[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Low Rank") +
  theme_bw()
```

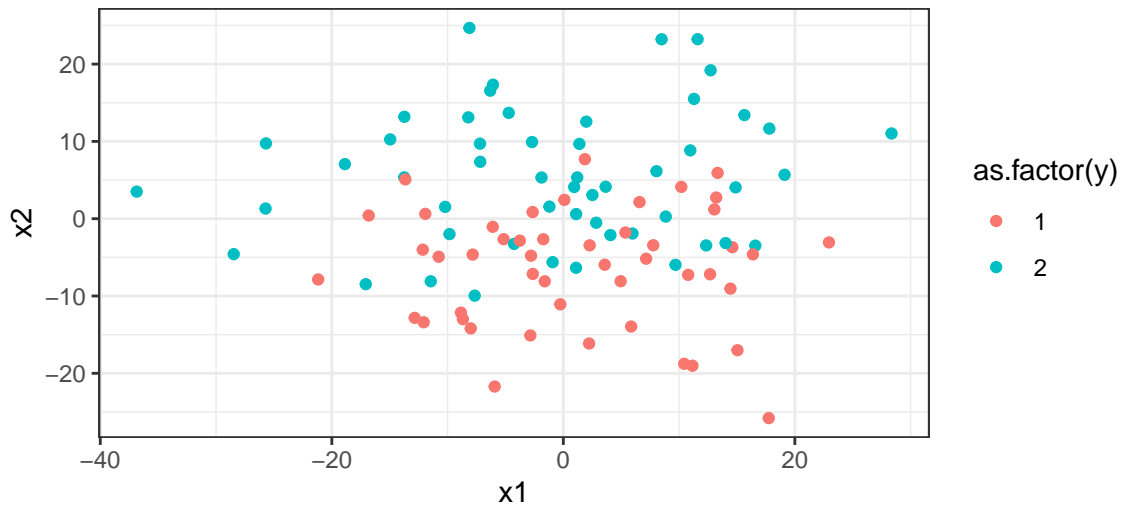


### PCA

```
res <- sim.results$lowrank$pca
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Low Rank -- PCA") +
  theme_bw()
```



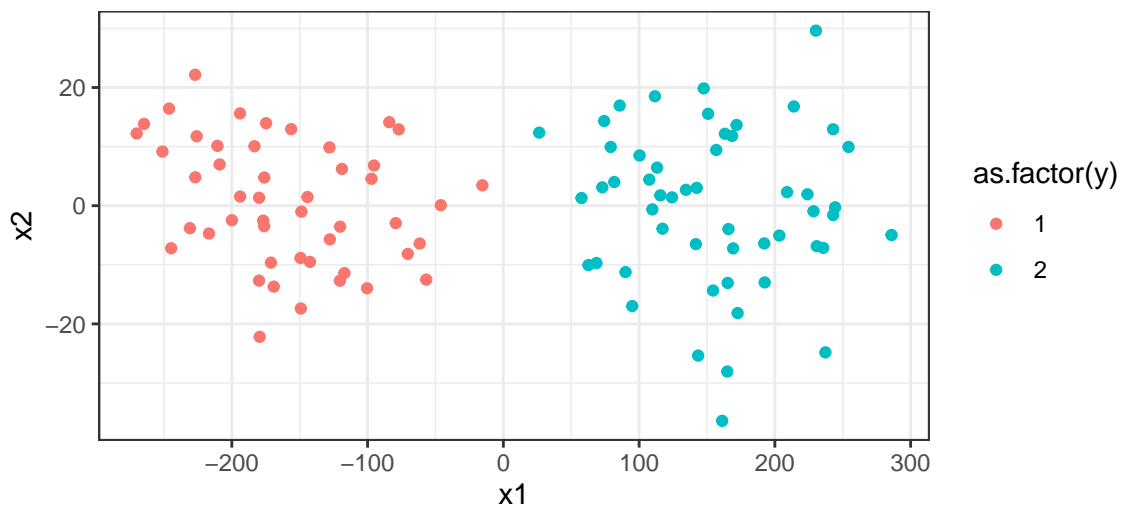
## Low Rank -- PCA



## LOL

```
res <- sim.results$lowrank$lol
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Low Rank -- LOL") +
  theme_bw()
```

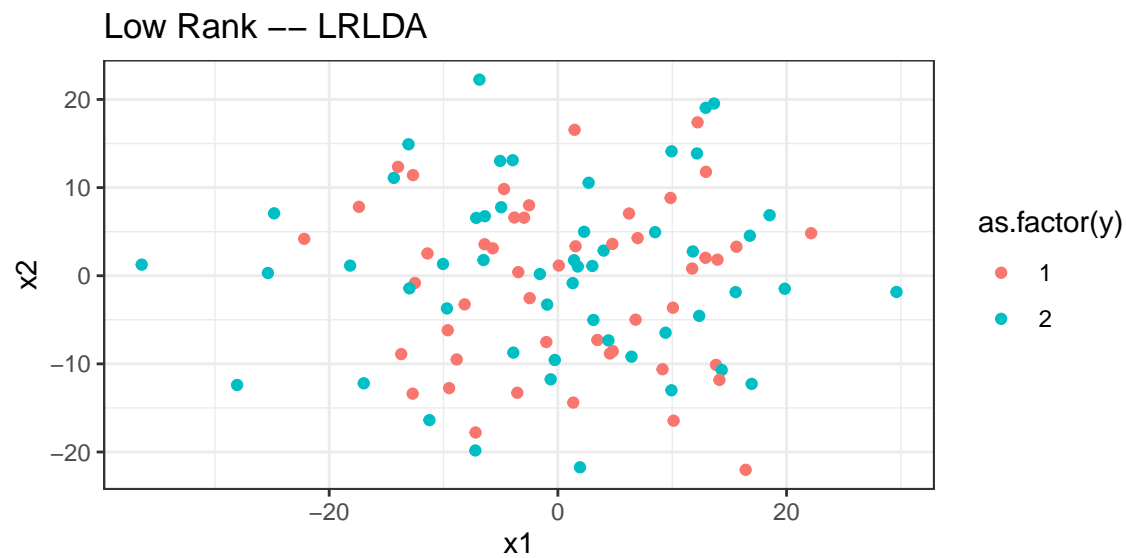
## Low Rank -- LOL



## LRLDA

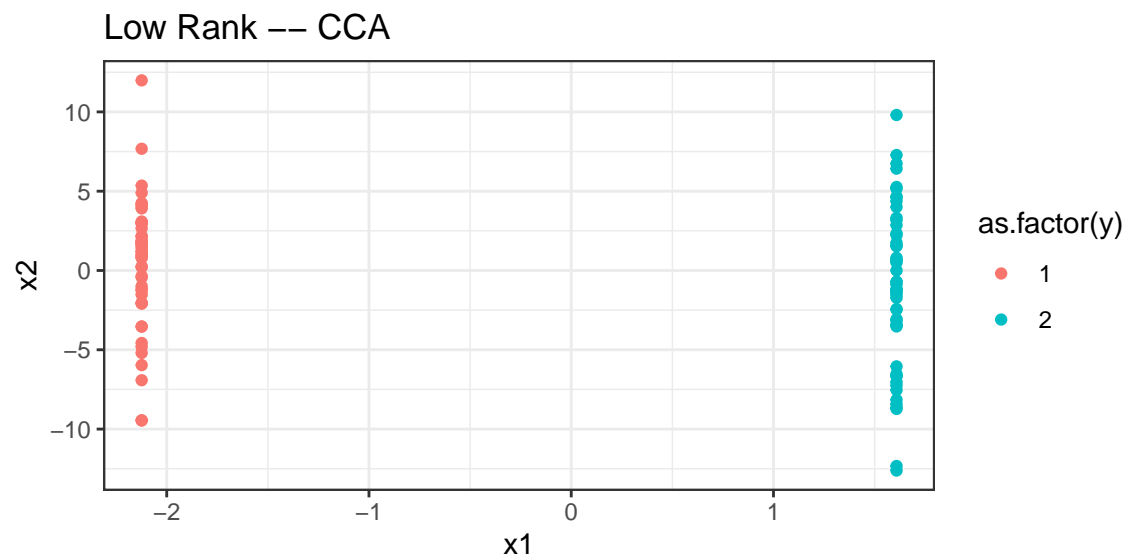
```
res <- sim.results$lowrank$lrllda
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
```

```
ggtitle("Low Rank -- LRLDA") +  
theme_bw()
```



## CCA

```
res <- sim.results$lowrank$cca  
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%  
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +  
  geom_point() +  
  ggtitle("Low Rank -- CCA") +  
  theme_bw()
```



## RP

```

res <- sim.results$lowrank$rp
data.frame(x1=res$Xr[,1], x2=res$Xr[,2], y=dat$Y) %>%
  ggplot(aes(x=x1, y=x2, color=as.factor(y))) +
  geom_point() +
  ggtitle("Low Rank -- RP") +
  theme_bw()

```

