

# Implementation Checks on tflashr

*David Gerard*

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## Abstract.

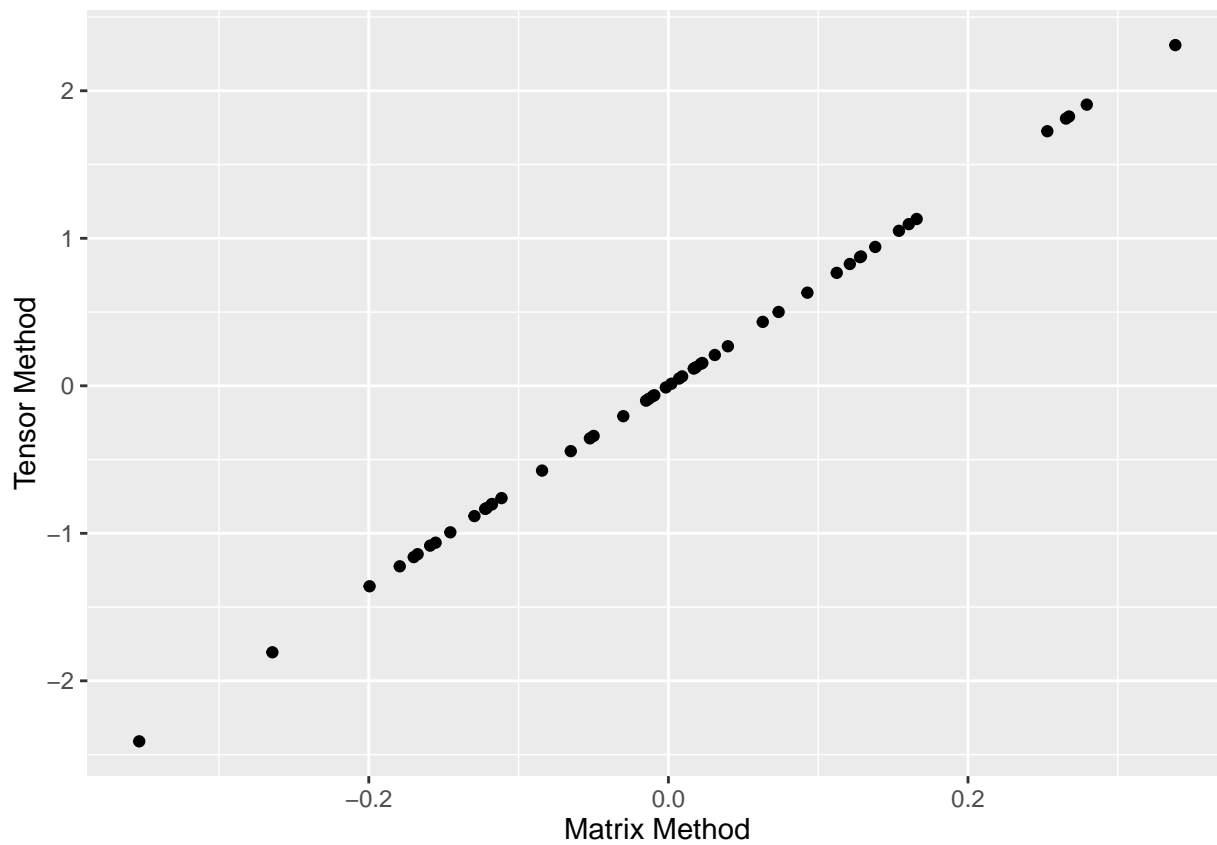
I run some implementation checks on `tgreedy`.

## See if equivalent to `flashr::greedy`

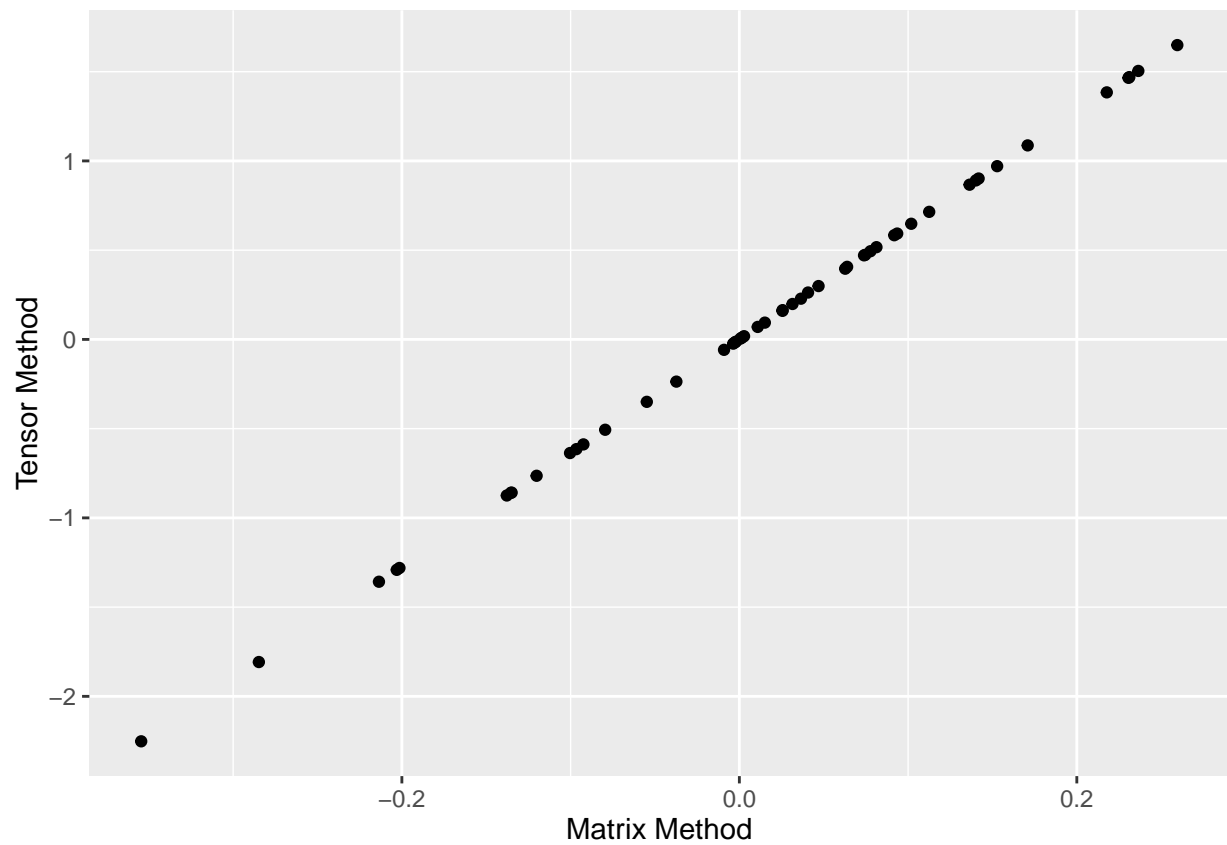
Generate matrix data and plot the components from `greedy` and `tgreedy`.

```
library(flashr)
set.seed(9489)
n <- 50
p <- 60
r <- 2
A <- matrix(rnorm(r * n), nrow = n)
B <- matrix(rnorm(r * p), ncol = p)
Theta <- A %*% B
E <- matrix(rnorm(n * p), nrow = n)
Y <- Theta + E

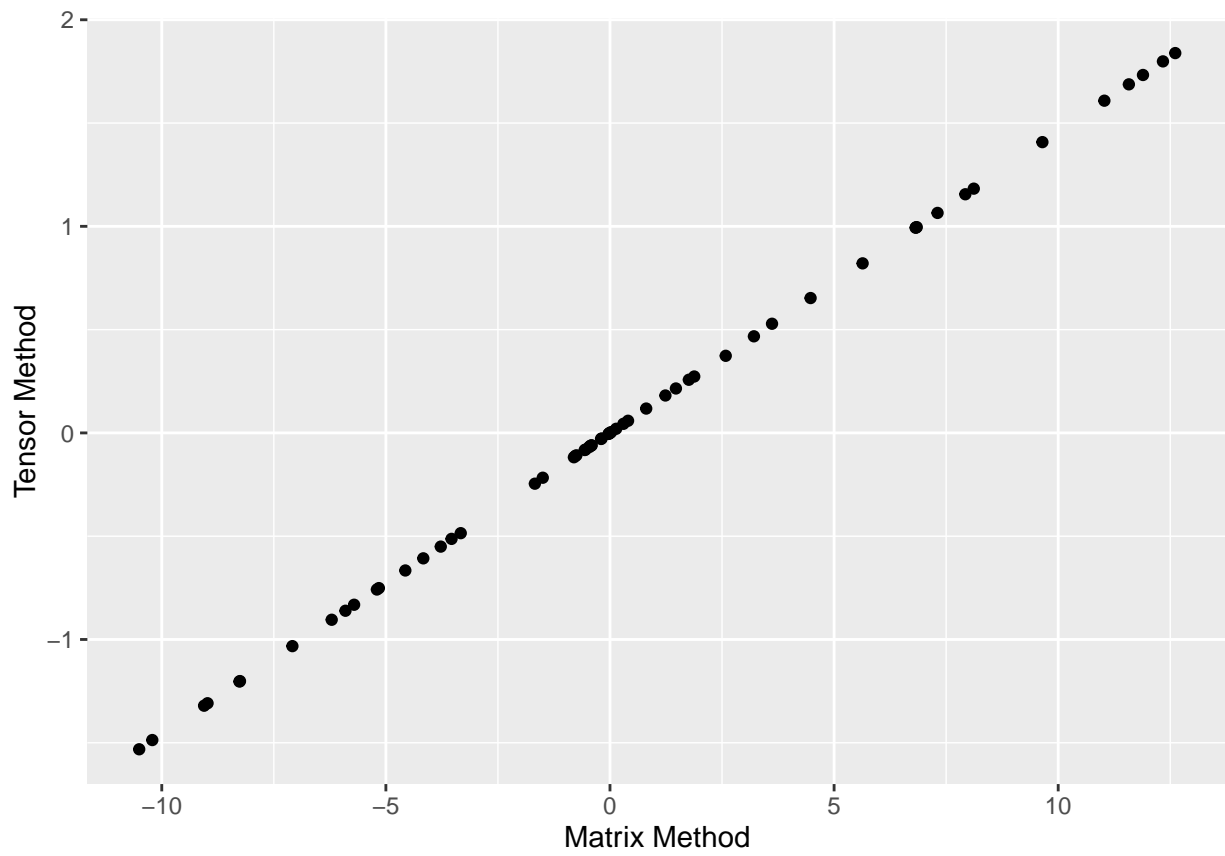
fout <- flashr::greedy(Y, K = 10)
tout <- flashr::tgreedy(Y, k = 10)
ggplot2::qplot(fout$l[,1], tout$factor_list[[1]][,1], xlab = "Matrix Method",
               ylab = "Tensor Method")
```



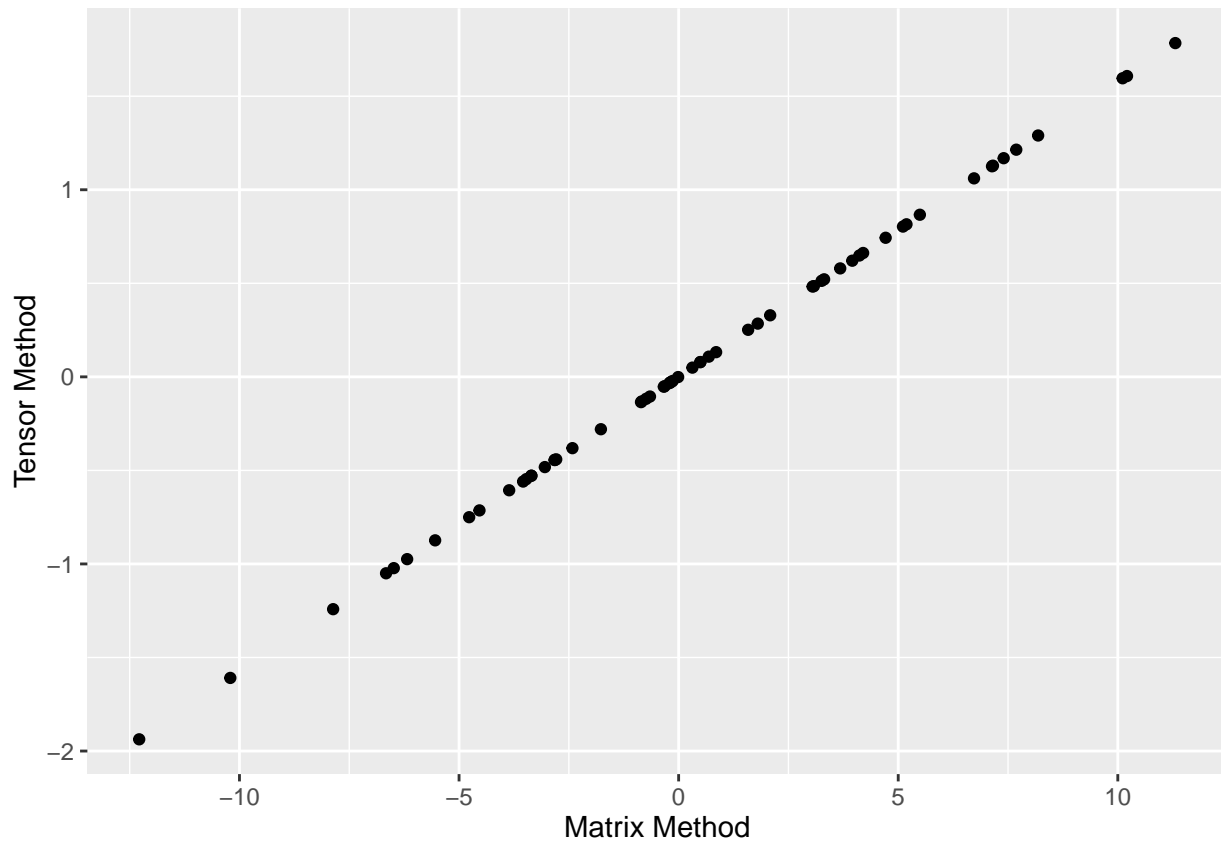
```
ggplot2::qplot(fout$1[,2], tout$factor_list[[1]][,2], xlab = "Matrix Method",  
               ylab = "Tensor Method")
```



```
ggplot2::qplot(fout$f[,1], tout$factor_list[[2]][,1], xlab = "Matrix Method",  
              ylab = "Tensor Method")
```



```
ggplot2::qplot(fout$f[,2], tout$factor_list[[2]][,2], xlab = "Matrix Method",  
               ylab = "Tensor Method")
```



Just make sure nothing funky is going on for tensor data.

Generate a cp-rank 2 tensor.

```
rm(list = ls())
set.seed(12)
p <- c(50, 50, 50)
u <- list()
u[[1]] <- rnorm(p[1])
u[[2]] <- rnorm(p[2])
u[[3]] <- rnorm(p[3])

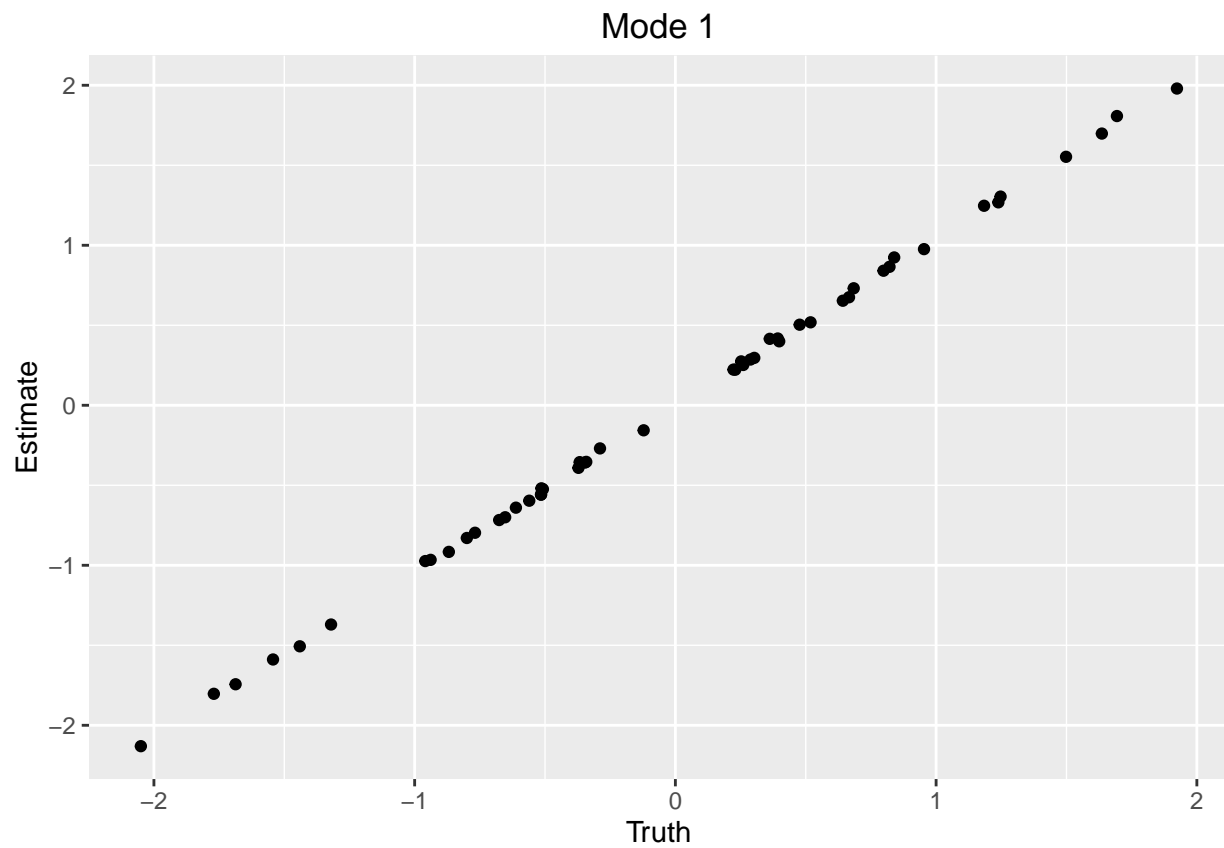
v <- list()
v[[1]] <- rnorm(p[1])
v[[2]] <- rnorm(p[2])
v[[3]] <- rnorm(p[3])

Theta <- form_outer(u) + form_outer(v)
E <- array(rnorm(prod(p)), dim = p)
Y <- Theta + E
```

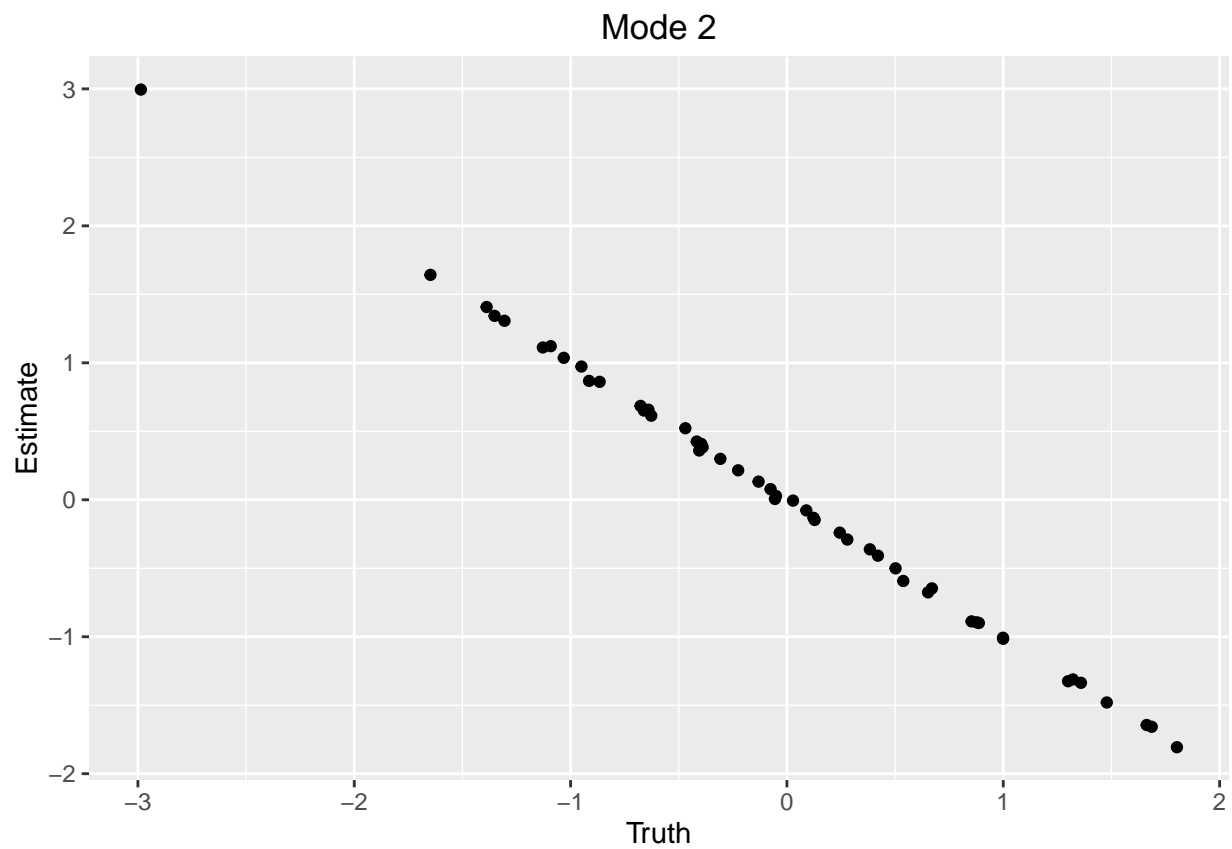
Fit model and plot estimates.

```
t_out <- tgreedy(Y)
```

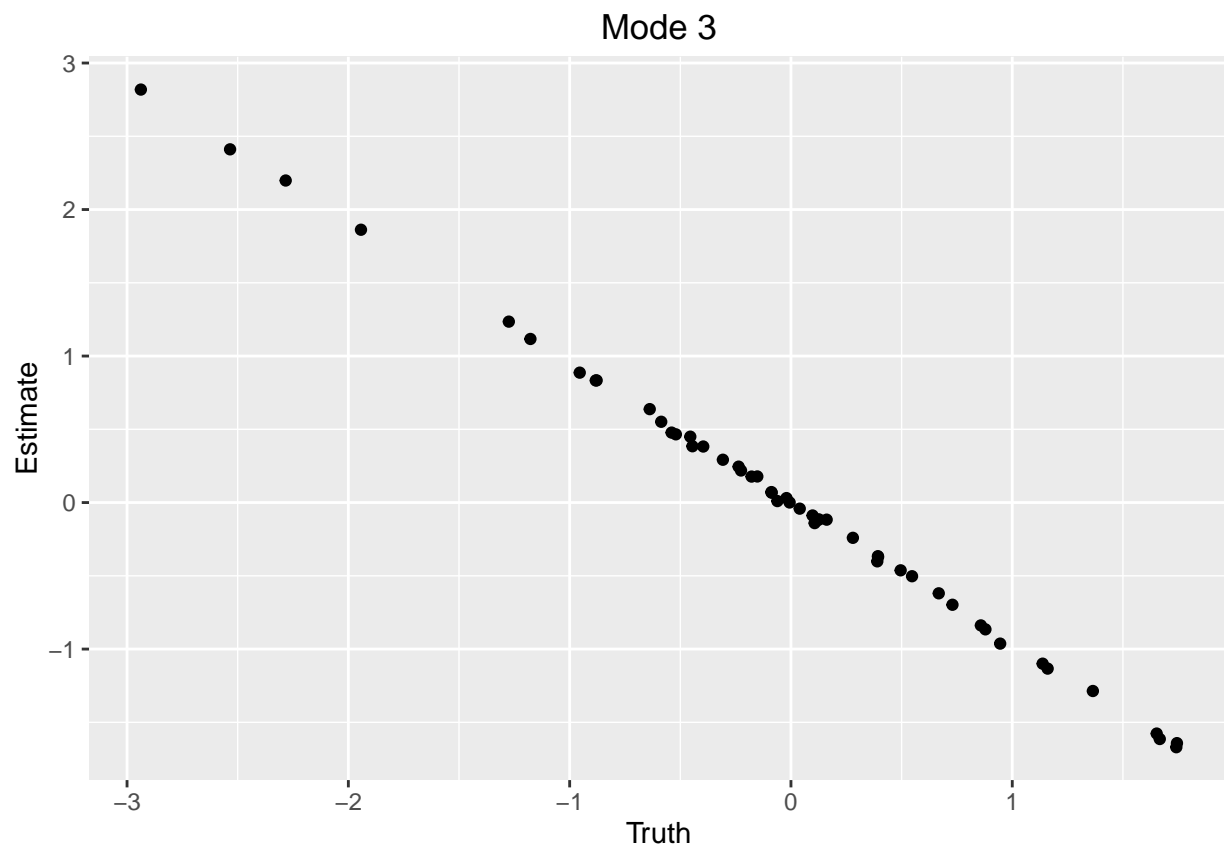
```
ggplot2::qplot(v[[1]], t_out$factor_list[[1]][,1], xlab = "Truth", ylab = "Estimate",  
              main = "Mode 1")
```



```
ggplot2::qplot(v[[2]], t_out$factor_list[[2]][,1], xlab = "Truth", ylab = "Estimate",  
              main = "Mode 2")
```

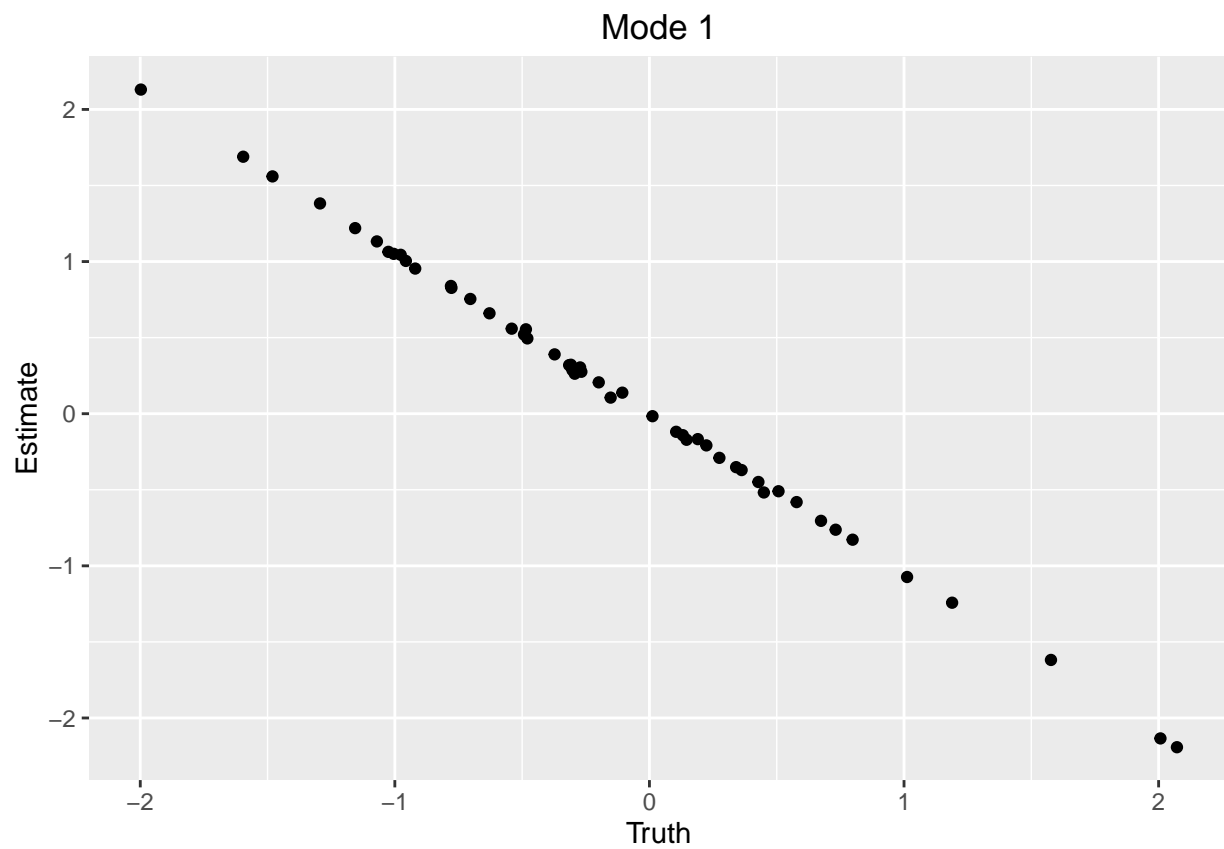


```
ggplot2::qplot(v[[3]], t_out$factor_list[[3]][,1], xlab = "Truth", ylab = "Estimate",  
              main = "Mode 3")
```

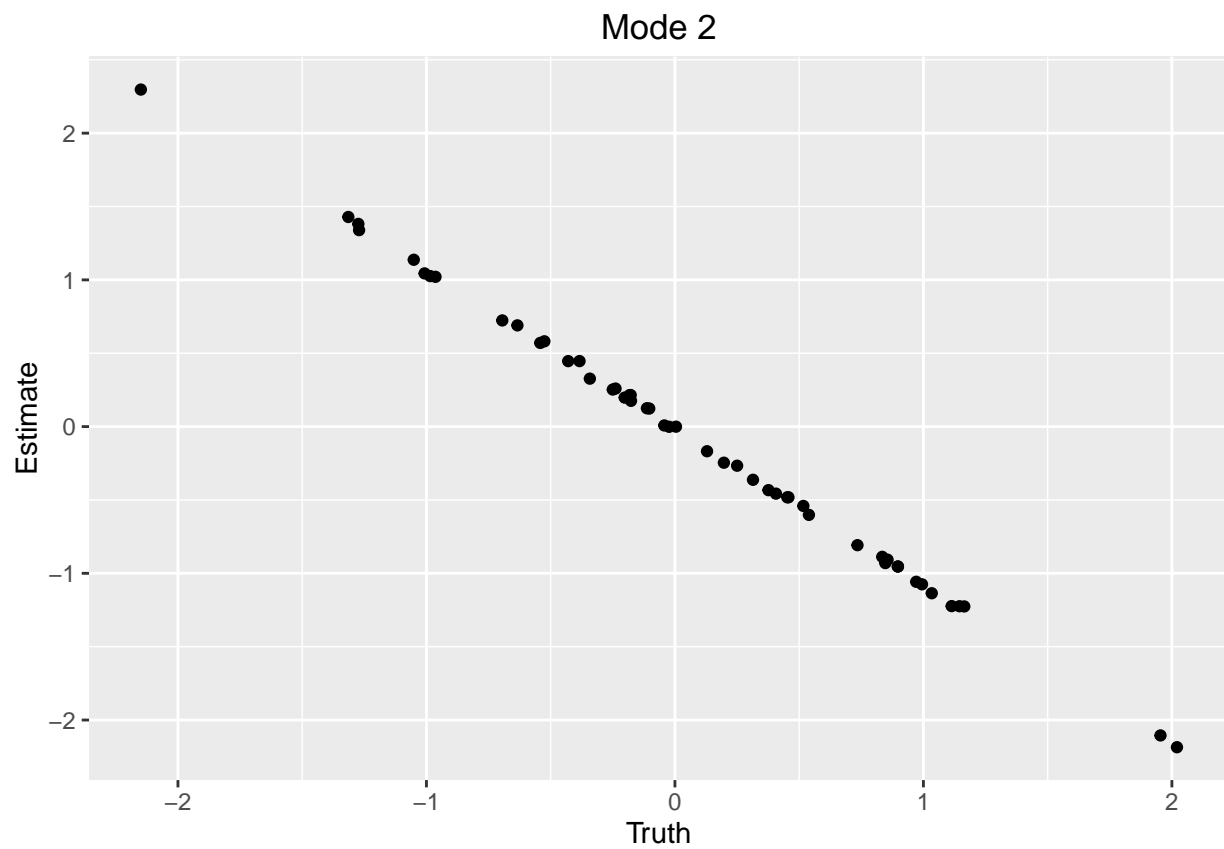


```
ggplot2::qplot(u[[1]], t_out$factor_list[[1]][,2], xlab = "Truth", ylab = "Estimate",  
              main = "Mode 1")
```





```
ggplot2::qplot(u[[2]], t_out$factor_list[[2]][,2], xlab = "Truth", ylab = "Estimate",  
              main = "Mode 2")
```



```
ggplot2::qplot(u[[3]], t_out$factor_list[[3]][,2], xlab = "Truth", ylab = "Estimate",  
              main = "Mode 3")
```

