Eigenvectors of Symmetric Matrices

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```
vec_iter <- function(it, fun){
  vec <- rep(NA, it)
  for(i in 1:it){
    vec[i] <- fun()
  }
  vec
}
all_ones <- function(){
  1
}
ret <- vec_iter(10,all_ones)
```

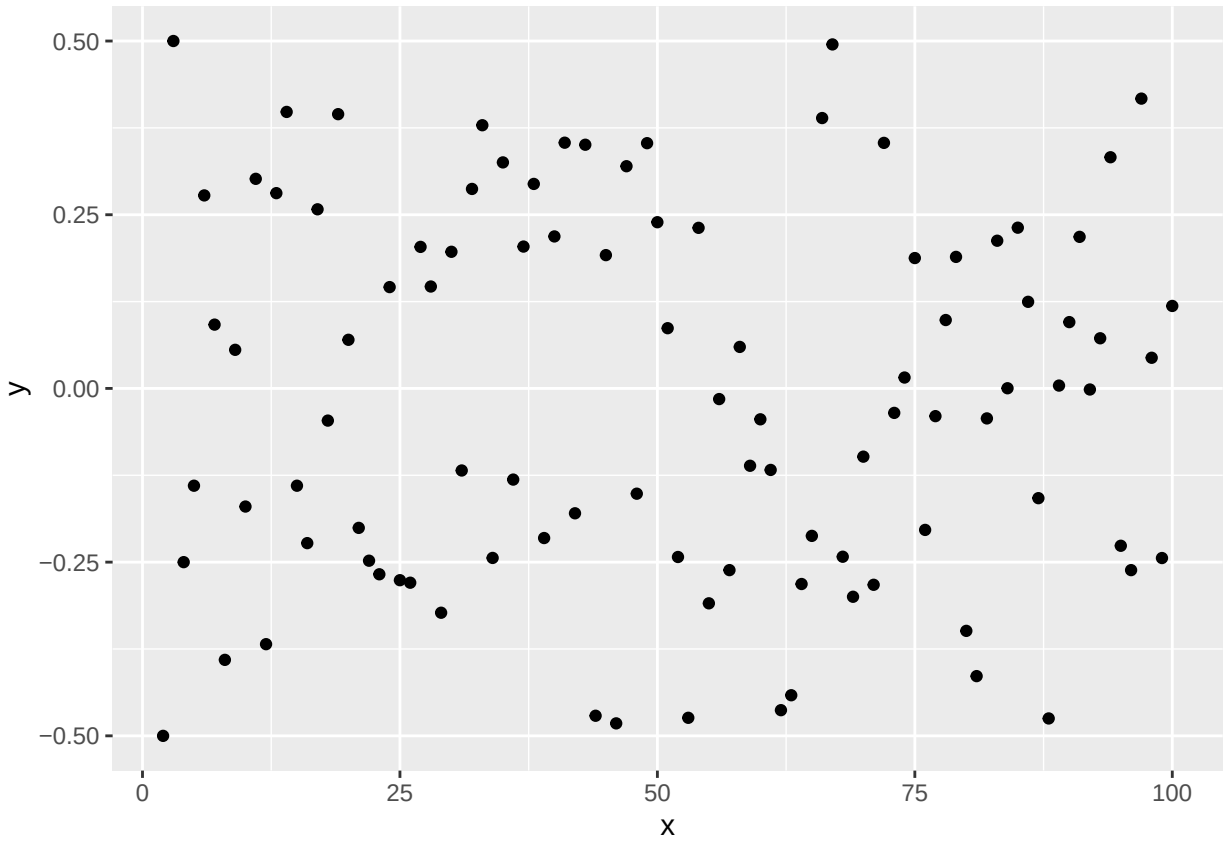
```
M <- 3
f <- 0.5
ep <- 100
dist <- unif_frand(M = M, f = f, ep = ep)
S <- make_symm(dist)
isSymmetric(S)
```

```
## [1] TRUE
```

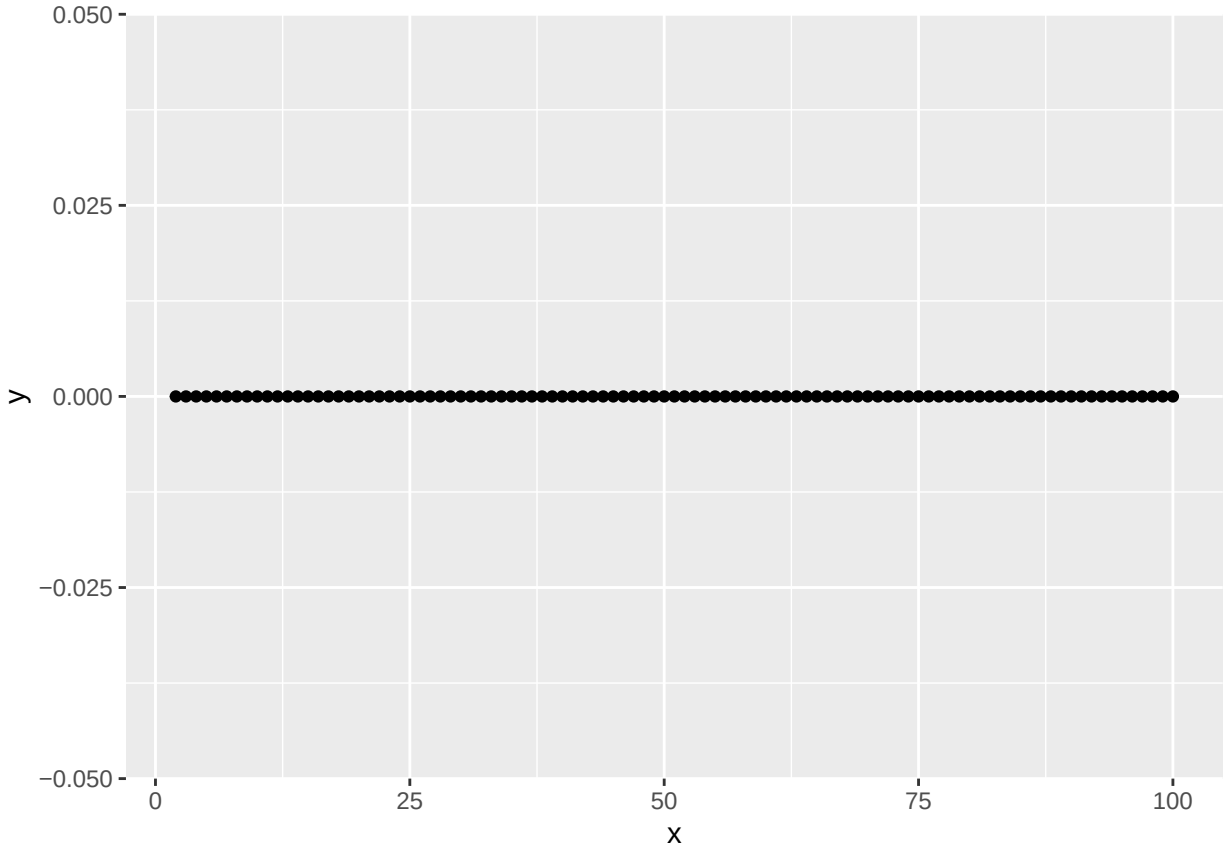
```
diff <- f - pos_entries(S)
diff
```

```
## [1] 0.5
```

```
M_vec <- 2:100
diff_props <- function(M){
  f <- 0.5
  ep <- 100
  dist <- unif_frand(M = M, f = f, ep = ep)
  S <- make_symm(dist)
  f - pos_entries(S)
}
iter_vec <- rep(NA, length(M_vec))
for(M in M_vec){
  iter_vec[M-1] <- diff_props(M)
}
ggplot() + geom_point(data = data.frame(x = M_vec, y = iter_vec), aes(x=x,y=y))
```




```
# add matrix so that we plot(ep,M) on xy plane and color value of diff to show 2d relation of convergen
M_vec <- 2:100
ep_vec <- 1:100
diff_props <- function(M, f = 1, ep = 1){
  S <- RM_symm(M,f,ep)
  f - pos_entries(S)
}
iter_vec <- rep(NA, length(M_vec))
for(M in M_vec){
  iter_vec[M-1] <- diff_props(M)
}
ggplot() + geom_point(data = data.frame(x = M_vec, y = iter_vec), aes(x=x,y=y))
```


0.050
0.025
0.000
−0.025
−0.050
y
0
25
50
75
100
x