4.2.4 more than 2 components

```
library(ggplot2)
library(tidyverse)
```

```
## Warning: package 'dplyr' was built under R version 4.2.3
```

```
## Warning: package 'stringr' was built under R version 4.2.3
```

```
## -- Attaching core tidyverse packages ----------------------- tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.4
## v forcats   1.0.0     v stringr   1.5.1
## v lubridate 1.9.3     v tibble    3.2.1
## v purrr     1.0.2     v tidyr     1.3.0
## -- Conflicts ------------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

beyong $n = 2$, $n = 4$ (4 nucleotides)

```r
masses = c( A =  331, C =  307, G =  347, T =  322 )

probs  = c( A = 0.12, C = 0.38, G = 0.36, T = 0.14 )

n  = 7000 # 7000 nucleotides
sd = 3
nuclt  = sample( length(probs), n, replace = TRUE, prob = probs)

quadwts = rnorm( length(nuclt),
                 mean = masses[nuclt],
                 sd   = sd )

ggplot(tibble(quadwts = quadwts), aes(x = quadwts)) +
  geom_histogram(bins = 100, fill = "purple")
```