Untitled

Jordan Aron

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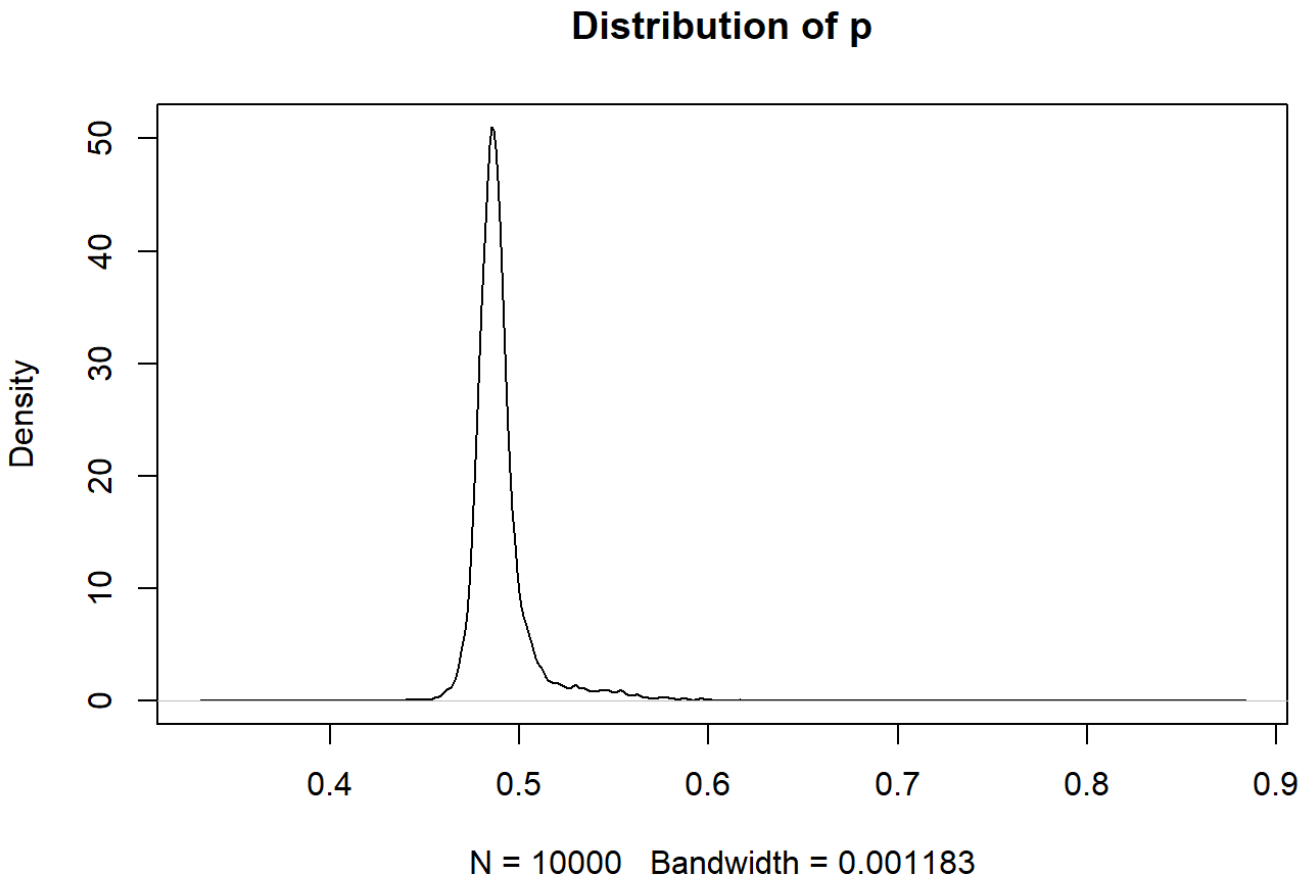
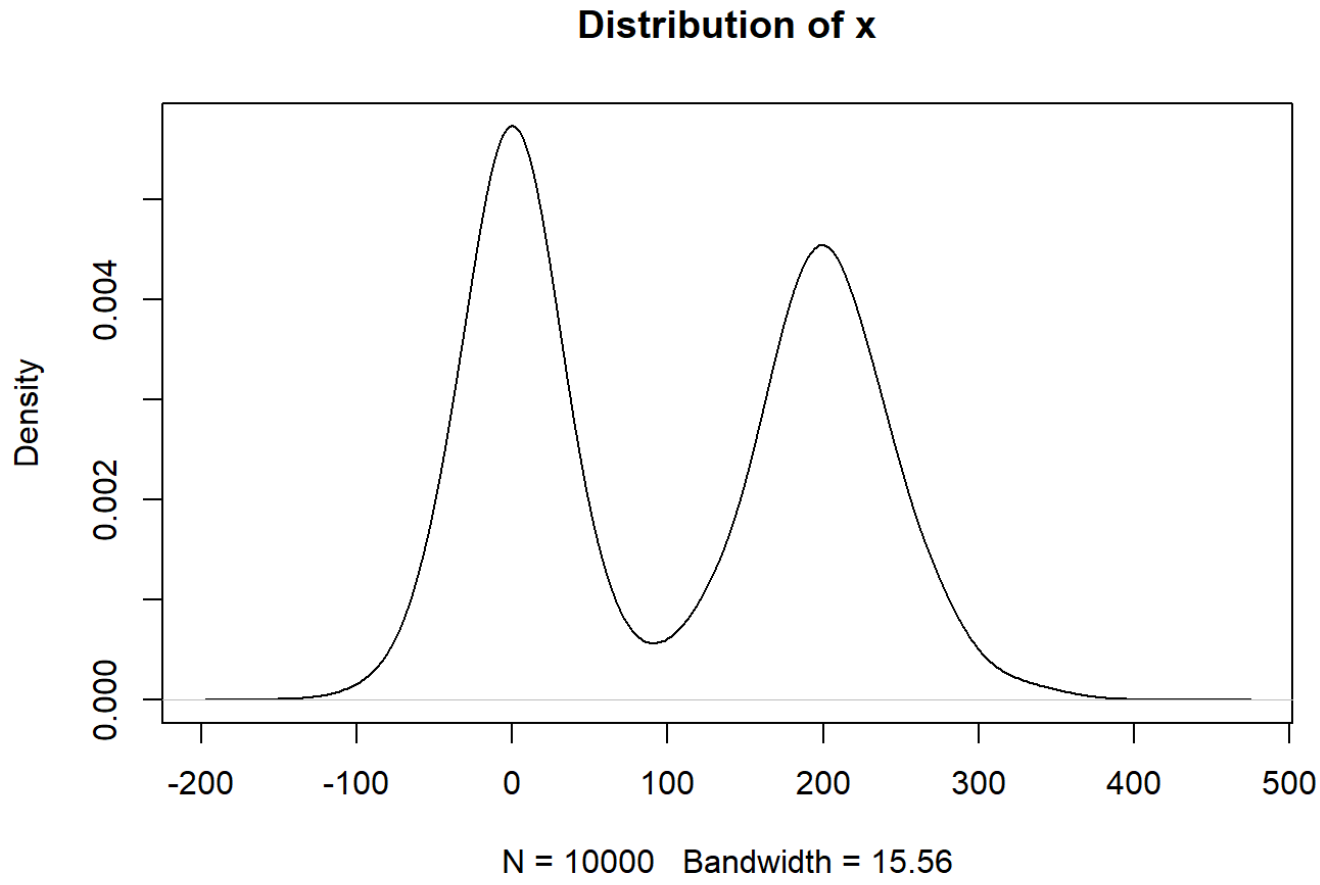
```
#p z x tau1 tau2 mu1 mu2
obs1 <- 500
obs2 <- 500

samp1 <- rnorm(obs1,0,10)
samp2 <- rnorm(obs2,200,10)

#meansamp1 <- mean(samp1)
#meansamp2 <- mean(samp2)

#ssdm1 <- sum((samp1 - meansamp1)^2)/(obs1-1)
#ssdm2 <- sum((samp2 - meansamp2)^2)/(obs2-1)

pop1 <- samp1
pop2 <- samp2

trials <- 10000
simlist <- matrix(rep(0,7*trials), ncol = 7)
simlist[1,1] <- runif(1)
simlist[1,2] <- 1
success = 20
failure = 20
for(i in 2:trials){
  simlist[i,1] <- rbeta(1,success, failure )
  simlist[i,2] <- rbinom(1,1,simlist[i,1])

  #if (i < 500){
   # simlist[i,3] <- (simlist[i,2])*rnorm(1,meansamp1,(ssdm1/2 * (obs1+1))/(obs1 *
(obs1/2))) +      (1-simlist[i,2])*rnorm(1,meansamp2,(ssdm2/2 * (obs2+1))/(obs2 * (
obs2/2)))

 # } else {
    simlist[i,3] <- (simlist[i,2])*rnorm(1,simlist[i-1,6], simlist[i-1,4]) + (1-s
imlist[i,2])*rnorm(1, simlist[i-1,7], simlist[i-1,5] )
  #}

  sigma1 <- rgamma(1, length(pop1)/2, (length(pop1/2)*var(pop1)))
  simlist[i,4] <- 1/sqrt(sigma1)

  sigma2 <- rgamma(1, length(pop2)/2, (length(pop2/2)*var(pop2)))
  simlist[i,5] <- 1/sqrt(sigma2)

  simlist[i,6] <- rnorm(1,mean(pop1),simlist[i,4]/sqrt(length(pop1)))
  simlist[i,7] <- rnorm(1,mean(pop2),simlist[i,5]/sqrt(length(pop2)))


  if (simlist[i,2] == 1) {
    success = success + 1
    pop1 <- c(pop1,simlist[i,3])
  } else {
```

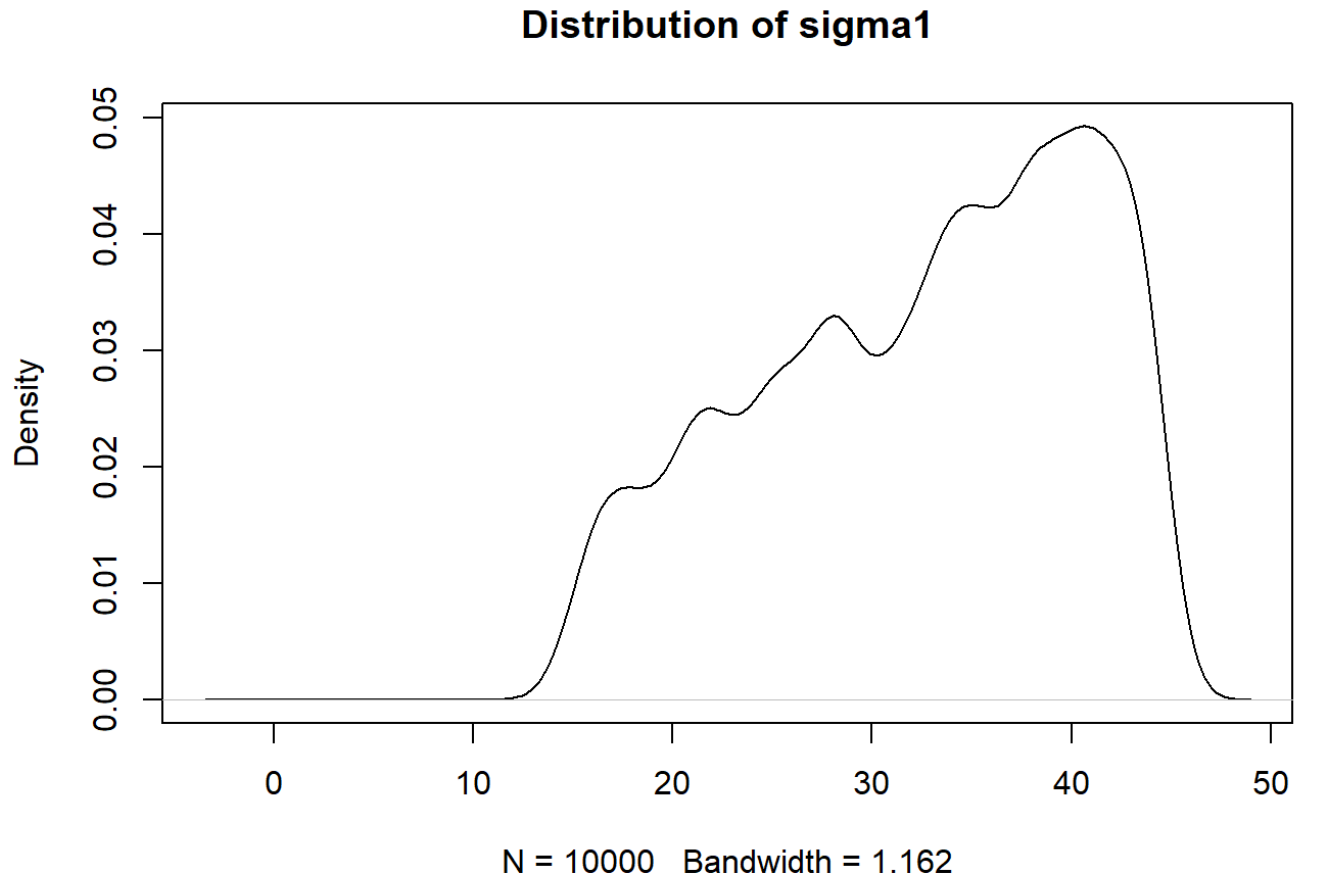
```
    failure = failure + 1
    pop2 <- c(pop2,simlist[i,3])
  }
}


plot(density(simlist[,1]), main = "Distribution of p")
```



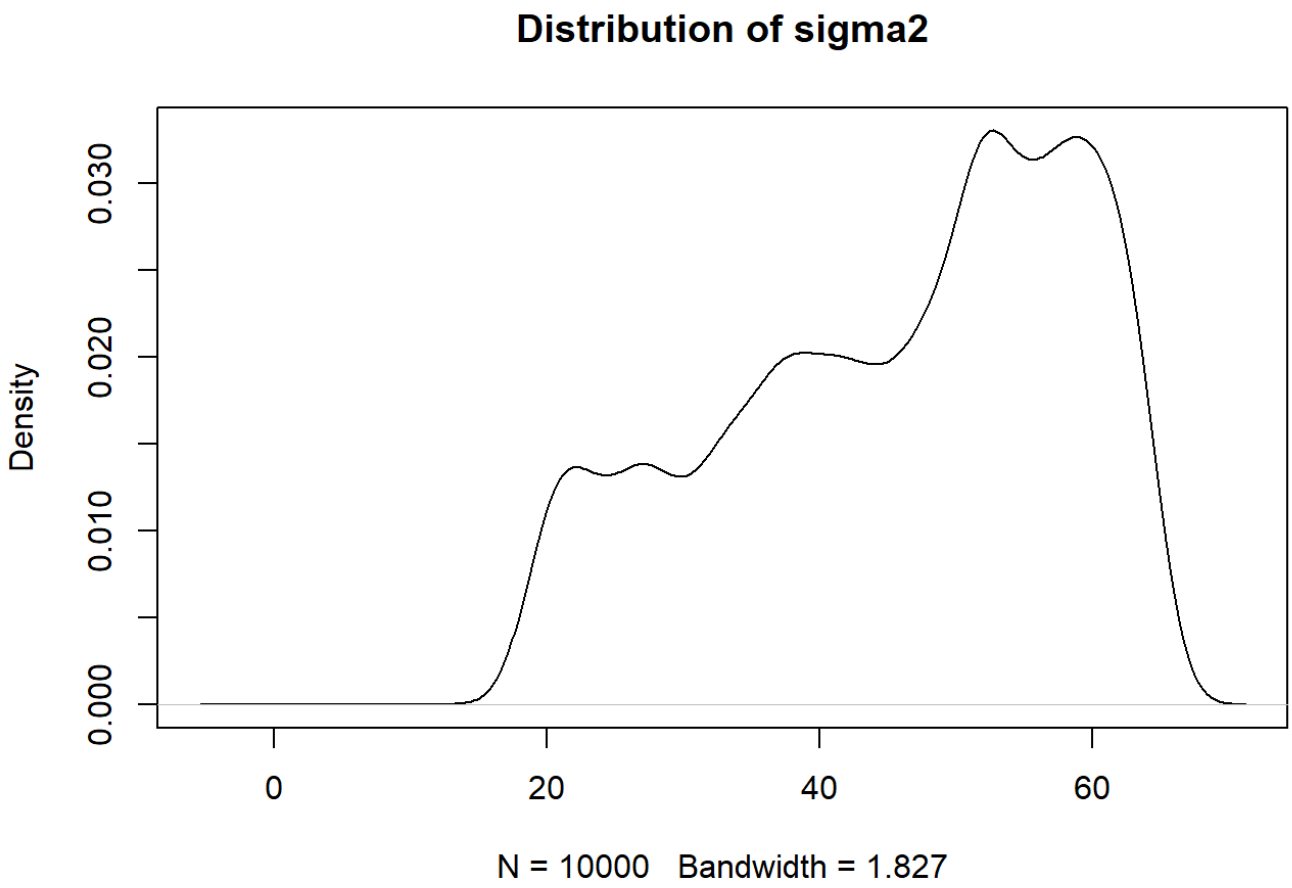

```
plot(density(simlist[,3]),main = "Distribution of x")
```



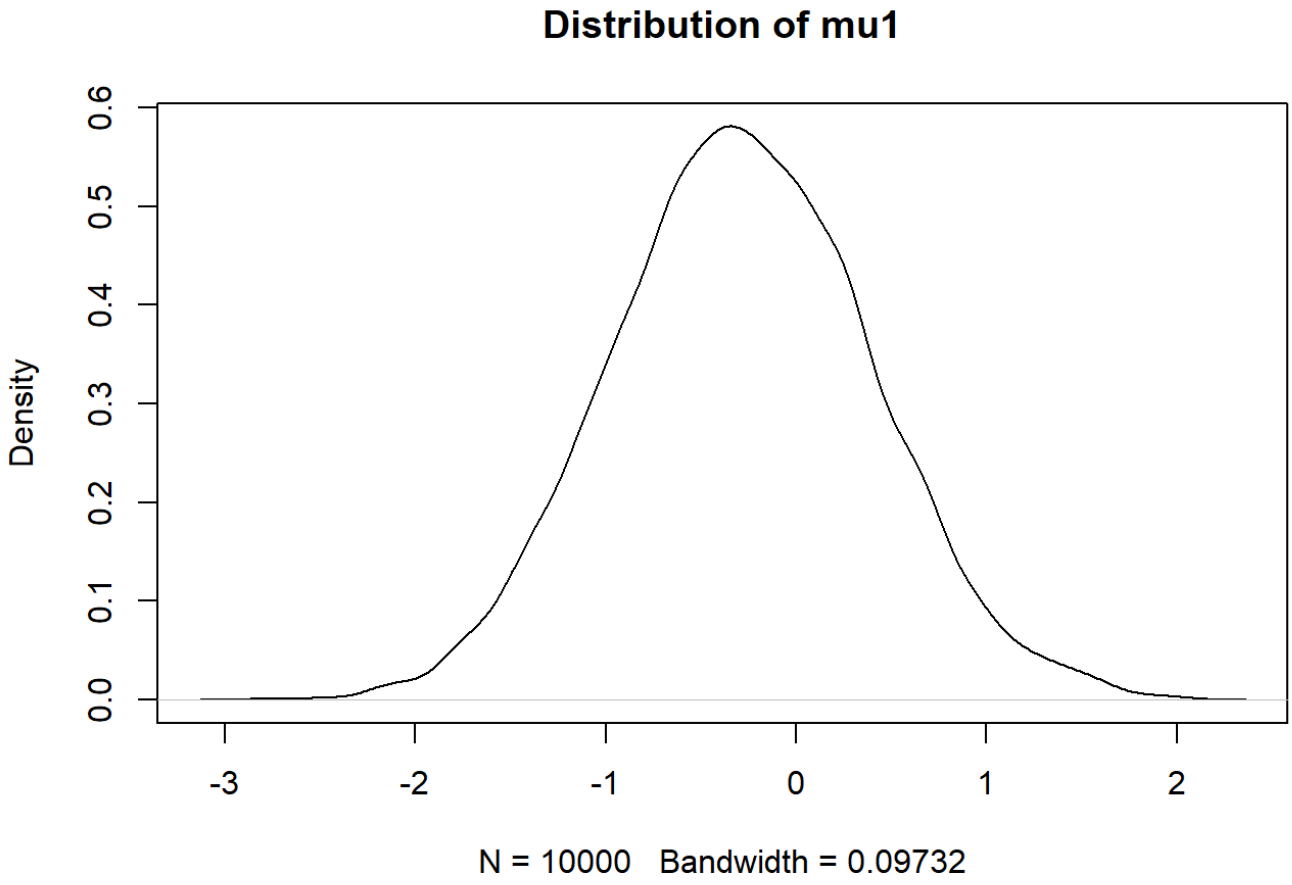

```
plot(density(simlist[,4]),main = "Distribution of sigma1")
```



```
plot(density(simlist[,5]),main = "Distribution of sigma2")
```




```
plot(density(simlist[,6]),main = "Distribution of mu1")
```




```
plot(density(simlist[,7]),main = "Distribution of mu2")
```