Q2_1

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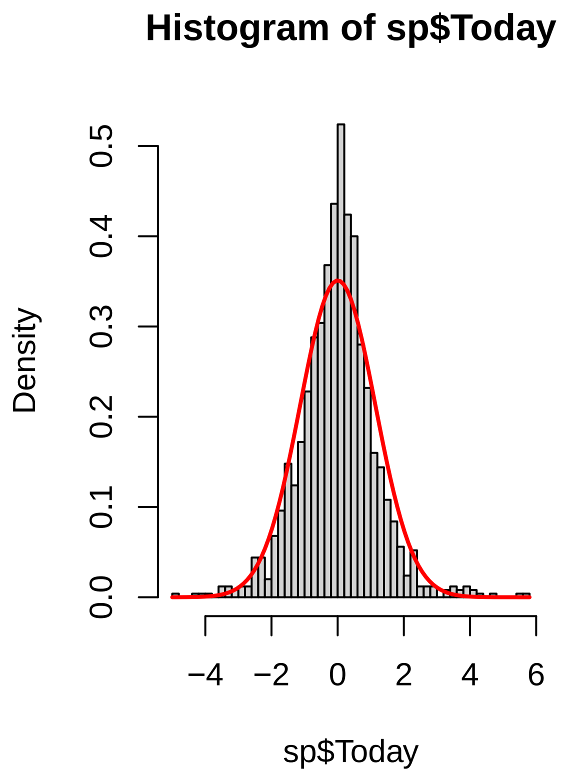
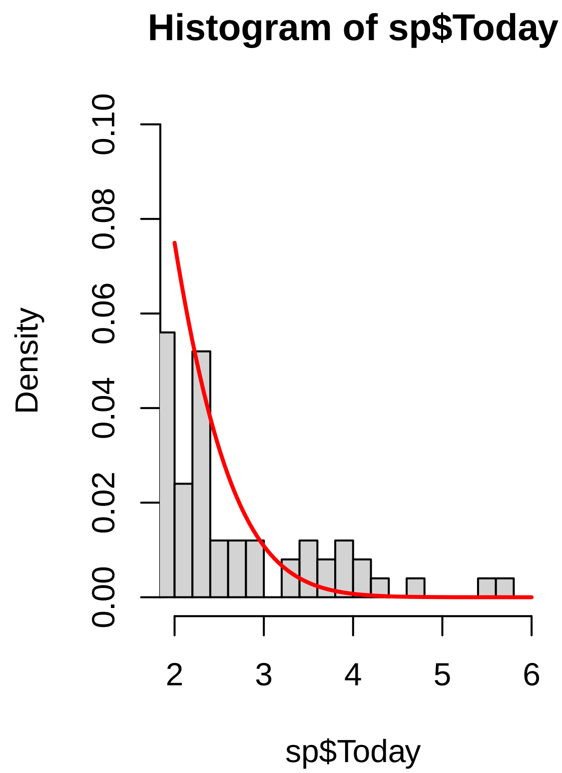
Answer: No, a normal distribution does not fit the daily-return data well especially at the areas around the tails and peak of the histogram because of its fat-tail behavior (kurtosis higher than 3).

```
library(ISLR)

n = nrow(Smarket)

dates = read.csv("C:/Users/kamin/OneDrive/Documents/min/mfe/uiuc/Fall2023/Stats_for_Fin/Week2/ISLRSmarke
sp = data.frame(dates, Smarket[,-1])

sample_mean = mean(sp$Today)
sample_sd= sd(sp$Today)

x = seq(0, 1, by = 0.01)

par(mfrow = c(1, 2))
hist(sp$Today, breaks = 50, freq=FALSE)
curve(dnorm(x,sample_mean,sample_sd),add=TRUE,col="red",lwd=2)

hist(sp$Today, breaks = 50, freq=FALSE, xlim=c(2,6),ylim=c(0,0.1))
curve(dnorm(x,sample_mean,sample_sd),add=TRUE,col="red",lwd=2, xlim=c(2,6),ylim=c(0,0.1))
```


Histogram of sp$Today
Density
0.0
0.1
0.2
0.3
0.4
0.5
−4
−2
0
2
4
6
sp$Today


Histogram of sp$Today
Density
0.00
0.02
0.04
0.06
0.08
0.10
2
3
4
5
6
sp$Today