

```

```{r, echo=TRUE}
if (!require(rjags)) {
 install.packages("rjags", dependencies = TRUE)
 library(rjags)
}

if (!require(coda)) {
 install.packages("coda")
 library(coda)
}
tsx_data <- read.csv("TSX.csv")

data_jags <- list(
 Close = tsx_data$Close,
 Open = tsx_data$Open,
 N = nrow(tsx_data))

model_string <- "
model {
 for (i in 1:N) {
 Close[i] ~ dnorm(mu[i], tau)
 mu[i] <- alpha + beta * Open[i] }
 alpha ~ dnorm(0, 0.0001)
 beta ~ dnorm(0, 0.0001)
 tau ~ dgamma(0.01, 0.01)
 sigma <- 1 / sqrt(tau)}
"

writeLines(model_string, con="tsx_model.jags")

inits <- function() {
 list(alpha = rnorm(1, 0, 100), beta = rnorm(1, 0, 10), tau = rgamma(1, 1, 1))
}

params <- c("alpha", "beta", "sigma")

jags_model <- jags.model("tsx_model.jags", data = data_jags, inits = inits, n.chains = 3,
n.adapt = 500)

mcmc_samples <- coda.samples(jags_model, variable.names = params, n.iter = 5000)

summary(mcmc_samples)
plot(mcmc_samples)
```
```{r, echo=TRUE}

if (!require(rjags)) {
 install.packages("rjags")

```

```

library(rjags)
}
if (!require(coda)) {
 install.packages("coda")
 library(coda)
}
tsx_data <- read.csv("TSX.csv")
tsx_data$Date <- as.Date(tsx_data$Date, format="%Y-%m-%d")
tsx_data$TimeIndex <- as.numeric(tsx_data$Date) # Convert dates to a numeric format for
regression

data_jags <- list(
 Close = tsx_data$Close,
 Open = tsx_data$Open,
 TimeIndex = tsx_data$TimeIndex,
 N = nrow(tsx_data)
)
model_string <- "
model {
 for (i in 1:N) {
 Close[i] ~ dnorm(mu[i], tau)
 mu[i] <- alpha + beta1 * Open[i] + beta2 * TimeIndex[i] # Linear model with time trend
 }
 alpha ~ dnorm(0, 0.0001)
 beta1 ~ dnorm(0, 0.0001)
 beta2 ~ dnorm(0, 0.0001) # Time trend coefficient
 tau ~ dgamma(0.01, 0.01)
 sigma <- 1 / sqrt(tau)
}
"

writeLines(model_string, con="tsx_model_time.jags")

inits <- function() {
 list(alpha = rnorm(1, 0, 100), beta1 = rnorm(1, 0, 10), beta2 = rnorm(1, 0, 10), tau =
rgamma(1, 1, 1))}

params <- c("alpha", "beta1", "beta2", "sigma")

jags_model <- jags.model("tsx_model_time.jags", data = data_jags, inits = inits, n.chains =
3, n.adapt = 500)

mcmc_samples <- coda.samples(jags_model, variable.names = params, n.iter = 5000)

plot(tsx_data$Date, tsx_data$Close, col="blue", type="l", xlab="Date", ylab="Close Price",
main="MCMC Prediction with Time Trend")
lines(tsx_data$Date, fitted.values(mcmc_samples), col="red", lwd=2)
...

```