M9_Exercise_LinePlotLinearFit_Abhishek_Jain

The entire R code used when creating the line plot in (1).

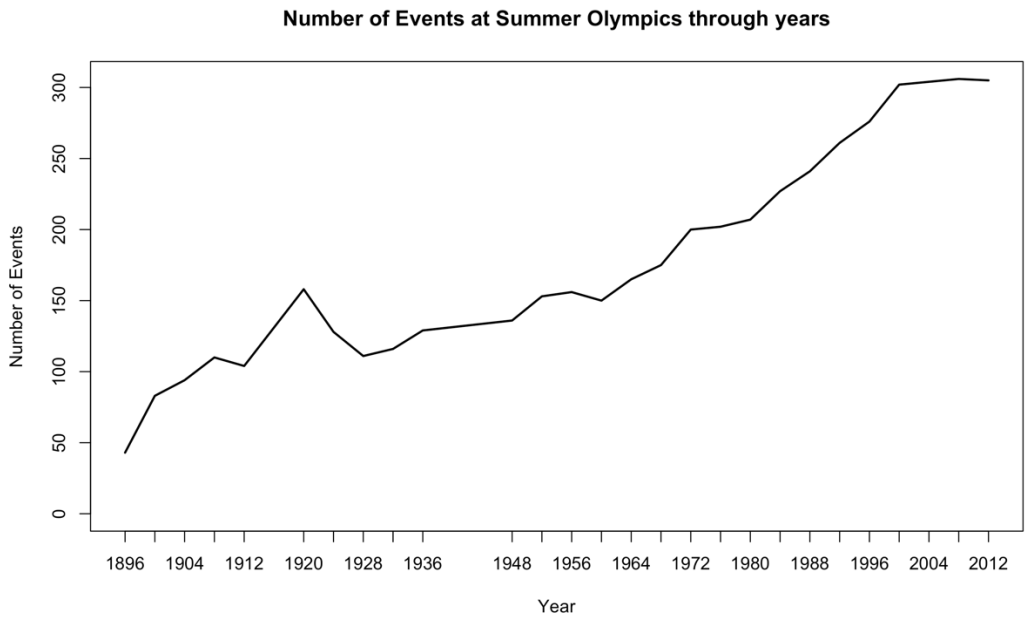
```r
# Loading the datasets
summerOlympics <- read.csv("summer.csv")
winterOlympics <- read.csv("winter.csv")
cherryBlossoms <- read.csv("cherry.csv")
temperature <- read.csv("washtemp.csv", header = TRUE, sep = ' ')

summerOlympics$ev <- paste(summerOlympics$Discipline, summerOlympics$Event,

                           summerOlympics$Gender, sep="_")

summerOlympicsEvents <- summerOlympics[c("Year", "ev")]
summerOlympicsEventsUnique <- unique(summerOlympicsEvents)
summerOlympicsEventsCount <- table(summerOlympicsEventsUnique$Year)
# Line plot of number of events each year
plot(summerOlympicsEventsCount, xlab = "Year", ylab = "Number of Events",
     main = "Number of Events at Summer Olympics through years", type="l")
```

Screenshot of the line plot created in (1).

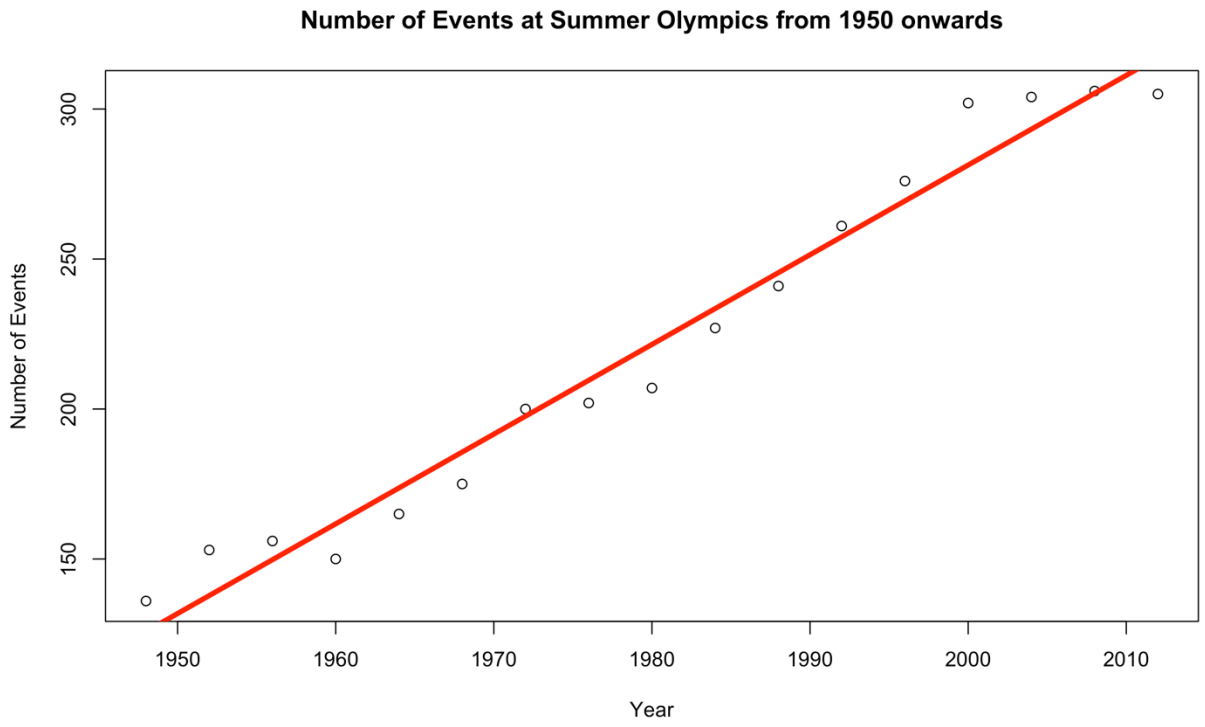


The entire R code used when creating the data frame in (2), scatter plot in (3), line in (4), and prediction in (5).

```r
summerOlympicsSubset <- as.data.frame(summerOlympicsEventsCount[11:27])
names(summerOlympicsSubset) = c("Year", "Events")
summerOlympicsSubset$Year <- as.numeric(as.character(summerOlympicsSubset$Year))
# Scatter plot of data from 1950 onwards
plot(summerOlympicsSubset, xlab = "Year", ylab = "Number of Events",
     main="Number of Events at Summer Olympics from 1950 onwards")
# Line fit
linefit1 <- lm(Events~Year, data = summerOlympicsSubset)
abline(linefit1, col = "red", lwd = 4)

# Predicting number of events in 2040
predict(linefit1, list(Year=2040))
```

Screenshot of the scatter plot created in (3) with the line created in (4).



The prediction (answer) made in (5).

```
> predict(linefit1, list(Year=2040))
       1
400.9412
```

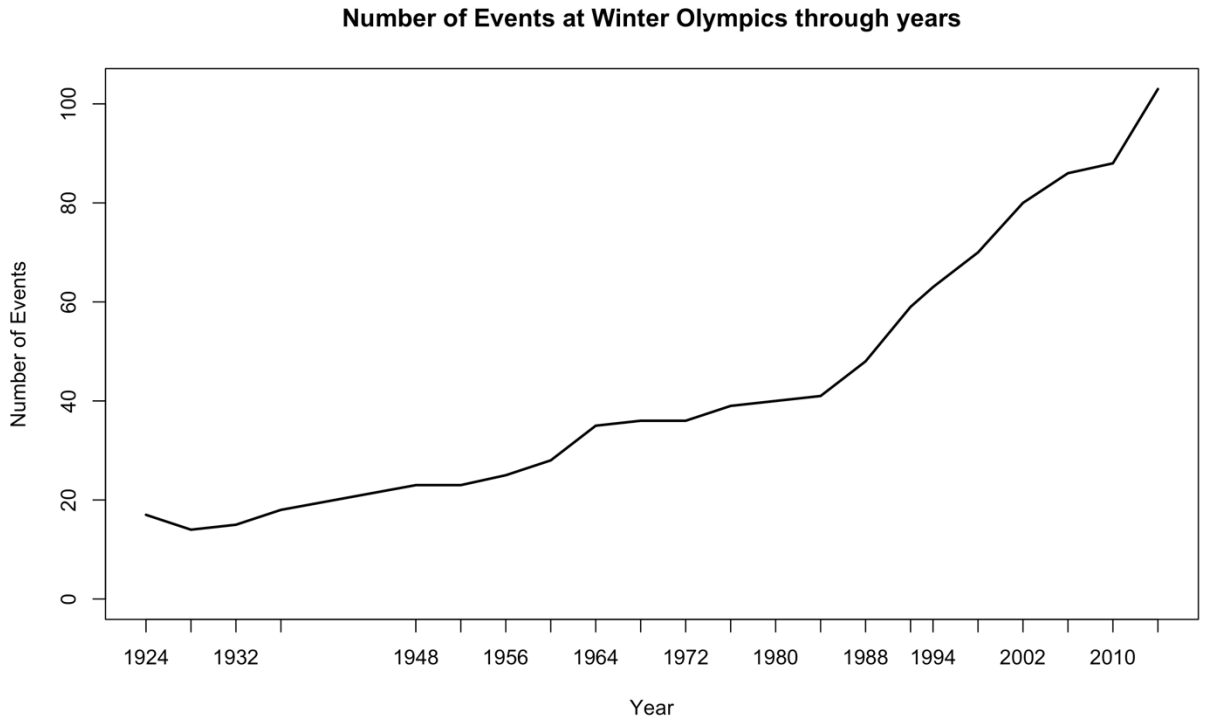
The entire R code used when creating the line plot in (6).

```r
winterOlympics$ev <- paste(winterOlympics$Discipline, winterOlympics$Event,

                           winterOlympics$Gender, sep="_")

winterOlympicsEvents <- winterOlympics[c("Year", "ev")]
winterOlympicsEventsUnique <- unique(winterOlympicsEvents)
winterOlympicsEventsCount <- table(winterOlympicsEventsUnique$Year)
# Line plot of number of events each year
plot(winterOlympicsEventsCount, xlab = "Year", ylab = "Number of Events",
     main = "Number of Events at Winter Olympics through years", type="l")
```

Screenshot of the line plot created in (6).

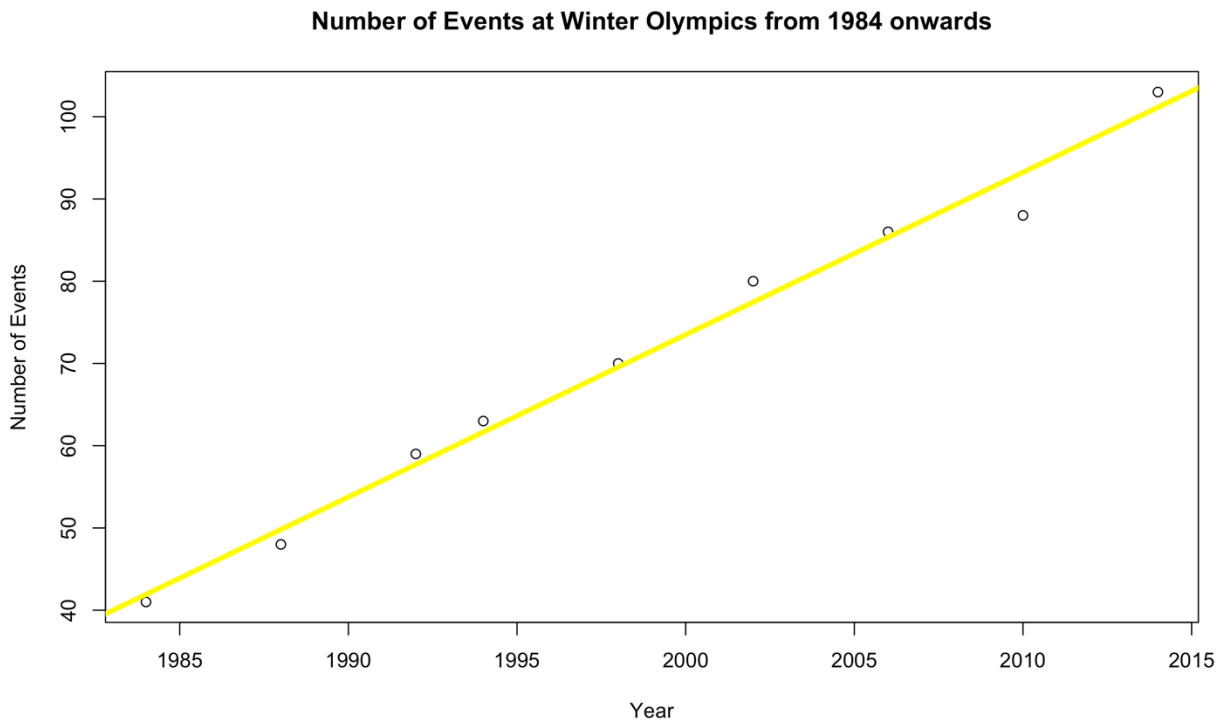


The entire R code used when creating the data frame in (7), scatter plot in (8), line in (9), and prediction in (10).

```r
# Data from 1984 onwards
winterOlympicsSubset <- as.data.frame(winterOlympicsEventsCount[14:22])
names(winterOlympicsSubset)=c("Year", "Events")
winterOlympicsSubset$Year<-as.numeric(as.character(winterOlympicsSubset$Year))
# Scatter plot of data from 1984 onwards
plot(winterOlympicsSubset, xlab = "Year", ylab = "Number of Events",
     main = "Number of Events at Winter Olympics from 1984 onwards")
# Line fit
linefit2 <- lm(Events~Year, data = winterOlympicsSubset)
abline(linefit2, col = "yellow", lwd = 4)

# Predicting number of events in 2040
predict(linefit2, list(Year=2040))
```

Screenshot of the scatter plot created in (8) with the line created in (9).



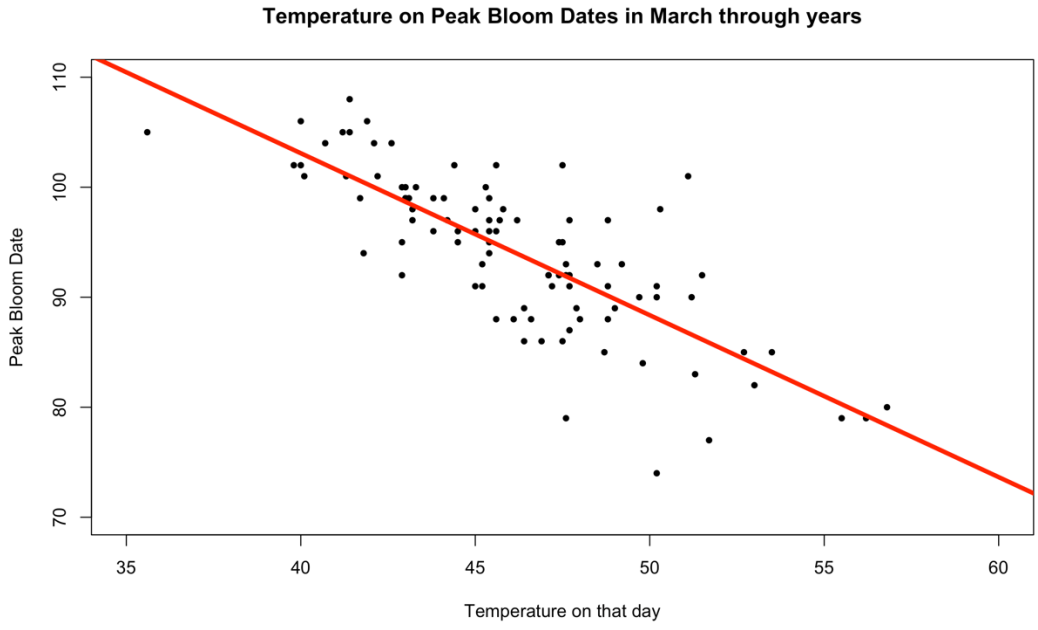
The prediction (answer) made in (10).

```
> predict(linefit2, list(Year=2040))
       1
152.4854
```

The entire R code used when creating the scatter plot in (11), and line in (12).

```
marchTemps <- data.frame(temperature$YEAR, temperature$MAR)
names(marchTemps)[1:2] <- c("Year", "Temperature")
bloomDates <- data.frame(cherryBlossoms$Year,cherryBlossoms$Yoshino.peak.bloom.date)
names(bloomDates)[1:2] <- c("Year", "BloomDate")
mergedData <- merge(bloomDates, marchTemps,
                    by = intersect(names(marchTemps),
                                   names(bloomDates)), by.x = 'Year')
# Scatter plot
plot(mergedData$Temperature, mergedData$BloomDate,
     main = "Temperature on Peak Bloom Dates in March through years",
     xlab = "Temperature on that day", ylab = "Peak Bloom Date",xlim = c(35, 60), ylim
= c(70, 110), pch = 20)
# Line plot
linefit3 <- lm(mergedData$BloomDate ~ mergedData$Temperature)
abline(linefit3, col="red", lwd = 4)
```

Screenshot of the scatter plot created in (11) with the line created in (12).



Your opinion about the correlation (or lack thereof) between the Cherry Blossom Peak Bloom Date and the Temperature in March.

We can see that the line passes through the data points. We can say that the bloom date and temperature are correlated. As the temperature increases, the bloom date decreases. So higher temperature causes blooming to happen faster. But too high temperatures might not let blooming happen. So, there is a negative correlation between them.