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### PM25_USA_EPA_NEI ###
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```
# Question 2: Have total emissions from PM2.5 decreased in the Baltimore City, Maryland (fips == "24510") from 1999 to 2008?
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```
# Use the base plotting system to make a plot answering this question.
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### Resources ###
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```
# EPA Government references
```

```
# Reference 1. 2011 National Emissions Inventory, version 1 Technical Support Document November 2013 - DRAFT
```

```
# http://www.epa.gov/ttn/chief/net/2008neiv3/2008\_neiv3\_tsd\_draft.pdf
```

```
# Reference 2. 2008 National Emissions Inventory, version 3 Technical Support Document September 2013 - DRAFT
```

```
# http://www.epa.gov/ttn/chief/net/2011nei/2011\_neiv1\_tsd\_draft.pdf
```

```
# STATE Government references
```

```
# Reference 3. Methodologies for U.S. Greenhouse Gas Emissions Projections: Non-CO2 and Non-Energy CO2 Sources DECEMBER, 2013
```

```
# http://www.state.gov/documents/organization/219472.pdf
```

```
# barplot
```

```
# 1 - http://www.ats.ucla.edu/stat/r/faq/barplotplus.htm
```

```
# 2 - http://www.spw.uzh.ch/vangijn/teaching/typologyinpractice/weekbyweek/R\_Bar\_plots.pdf
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### plot2 R code ###
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```
# Create a function called plot2_TotalEmissionsPM2.5_BALTIMORE_1999_to_2008() to do the requested plot
```

```
plot2_TotalEmissionsPM2.5_BALTIMORE_1999_to_2008 = function()
```

```
{
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```
  # Set the working directory on my local machine
```

```
  setwd("~/Desktop/Data Science Specialization/Exploratory Data Analysis/Course project 2")
```

```
  # Read the PM2.5 Emissions Data in summarySCC_PM25.rds file with readRDS() function
```

```
  NEI <- readRDS("summarySCC_PM25.rds")
```

```
  # Read the Source Classification Code Table in Source_Classification_Code.rds file with readRDS() function
```

```
  SCC <- readRDS("Source_Classification_Code.rds")
```

```
  # Define the Baltimore dataset
```

```
  # Subset of PM2.5 Emissions Data with NEI$fips == "24510"
```

```
  NEI_Baltimore <- subset(NEI, fips == "24510")
```

```
  # another method: NEI_Emissions_Baltimore_Year <- NEI[NEI$fips==24510,]
```

```
  # Sum PM2.5 emissions in Baltimore by year with tapply() function
```

```

NEI_Emmissions_Baltimore_Year <- tapply(NEI_Baltimore$Emissions, NEI_Baltimore$year, sum)

# Plot barplot
barplot(NEI_Emmissions_Baltimore_Year,
        names.arg = toupper(names(NEI_Emmissions_Baltimore_Year)),
        legend.text = TRUE,
        col = c("darkgreen", "olivedrab4", "green2", "darkolivegreen1"),
        border = "blue",
        xlab = "Year",
        ylab = "PM2.5 Emissions (Tons)",
        ylim=c(0,3500),
        main = "Baltimore (USA) Total PM25 Emissions from 1999 to 2008",
        font.main = 3,
        cex.main = 1.5,
        sub = "source : summarySCC_PM25.rds",
        cex.sub = 0.8,
        cex.names = 0.8,
        cex.axis = 0.8,
        args.legend = list(title = "Legend: Color - Year", x = "topright", cex = 0.75))
# Add a dashed line relaying each total emissions from PM2.5 for 1999, 2002, 2005, 2008
lines(NEI_Emmissions_Baltimore_Year, lw = 2, col = "darkgrey", lty = 2, cex = 1)
# Add points to each total emissions from PM2.5 for 1999, 2002, 2005, 2008
points(NEI_Emmissions_Baltimore_Year, lw = 4, col = "darkgrey", pch = 15)
# Add all values for total emissions from PM2.5 for 1999, 2002, 2005, 2008 next to the points
text(1, NEI_Emmissions_Baltimore_Year[1], labels = round(NEI_Emmissions_Baltimore_Year[1], 0),
pos = 3, cex = 1)
text(2, NEI_Emmissions_Baltimore_Year[2], labels = round(NEI_Emmissions_Baltimore_Year[2], 0),
pos = 3, cex = 1)
text(3, NEI_Emmissions_Baltimore_Year[3], labels = round(NEI_Emmissions_Baltimore_Year[3], 0),
pos = 3, cex = 1)
text(4, NEI_Emmissions_Baltimore_Year[4], labels = round(NEI_Emmissions_Baltimore_Year[4], 0),
pos = 3, cex = 1)

# Save png file in working directory
dev.copy(png, filename = "plot2.png", height = 600, width = 800, unit = "px", bg = "transparent")

# Release screen
dev.off()
}

plot2_TotalEmissionsPM2.5_BALTIMORE_1999_to_2008()

# Answer 2: PM2.5 Total Emissions in Baltimore decreased in the USA between 1999 and 2008.

```