MANIPULATING TIME SERIES DATA IN R: CASE STUDIES

Welcome to the Course

Introduction

- Practice with data related to Boston tourism

Source: https://commons.wikimedia.org/

Course Overview

- Chapter 1: Flights arriving in Boston
- Chapter 2: Boston weather data
- Chapter 3: United States economic data
- Chapter 4: Boston sports data

MANIPULATING TIME SERIES DATA IN R: CASE STUDIES

Let’s get started!

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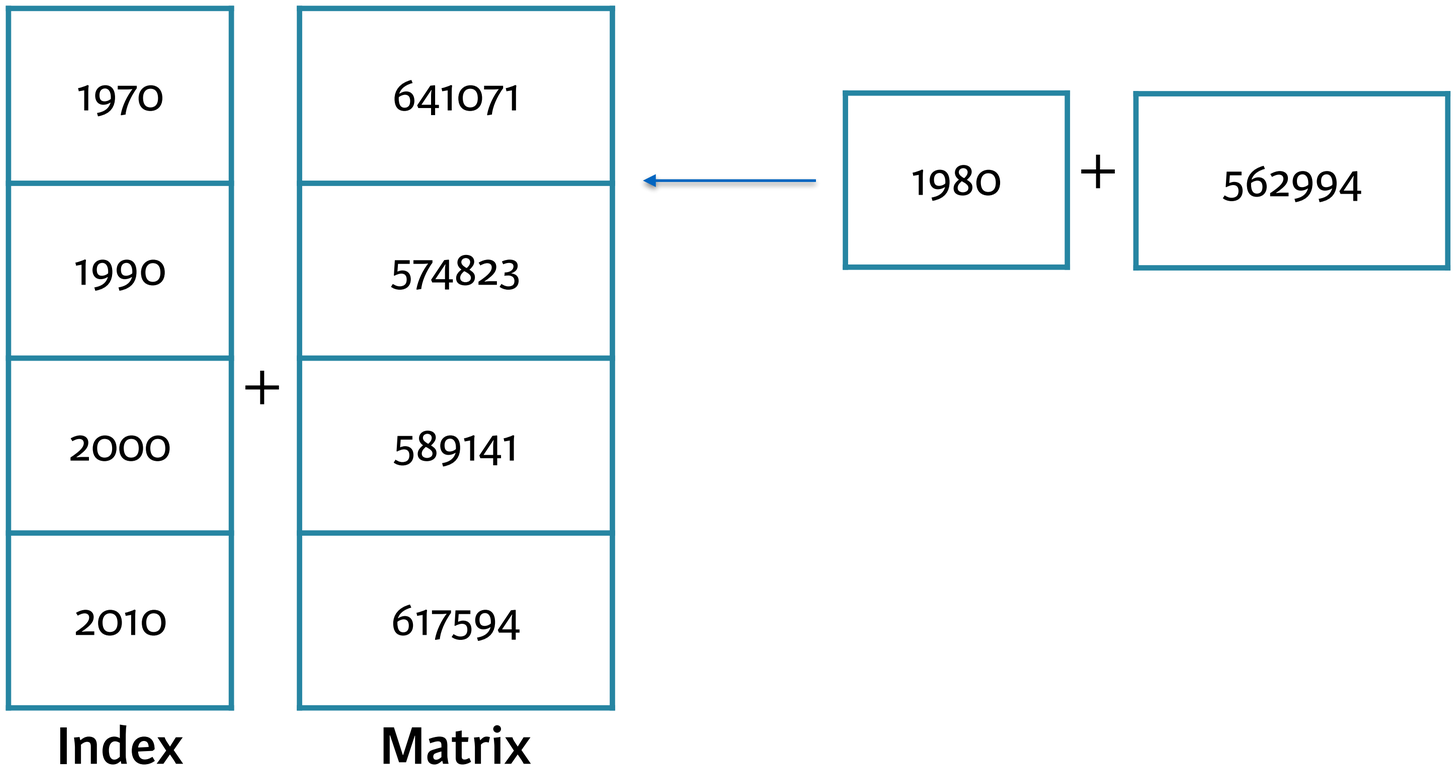
Review xts Fundamentals

Time Series Data

- One or more units over many periods

Year	Population
1980	562994
1990	574823
2000	589141
2010	617594

What are xts Objects?



Flight Data

- Flight delays and cancellations, 2010 through 2015

Source: https://commons.wikimedia.org/

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Manipulating and Visualizing Your Data

Qualities of xts Objects

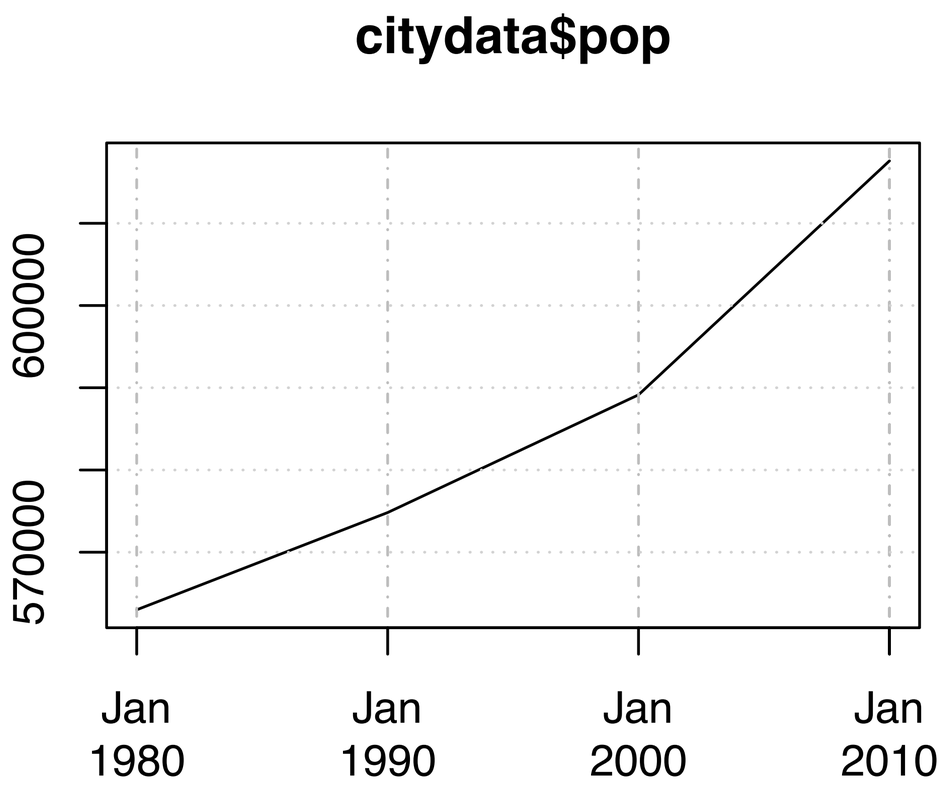
- Periodicity: Units of time in your data

```
> periodicity(citydata)

Yearly periodicity from 1980-01-01 to 2010-01-01
```

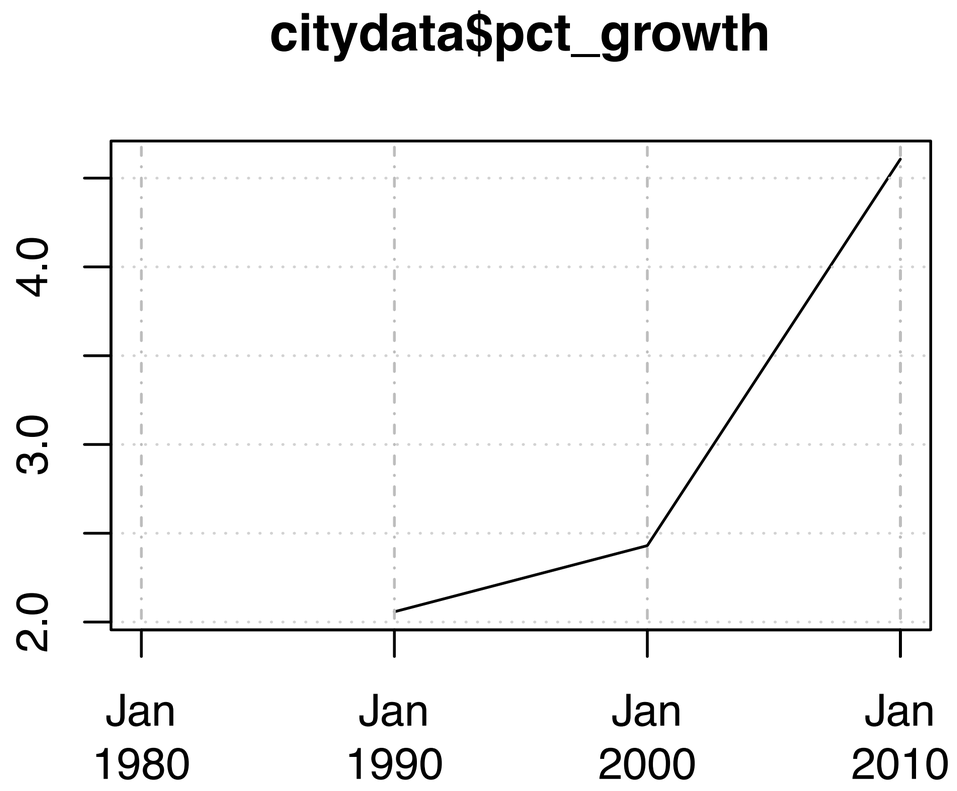
Plotting Time Series Data

```
> plot.xts(citydata$pop)
```



Plotting Time Series Data

```
> citydata$pct_growth <- (diff(citydata$pop) / citydata$pop) * 100
> plot.xts(citydata$pct_growth)
```



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Saving and Exporting xts Objects

Saving as rds

- Use saveRDS() and readRDS()

```
> saveRDS(citydata, file = "citydata.rds")
```

- Maintains time index of xts objects

```
> readRDS("citydata.rds")

               pop pct_growth
1980-01-01 562994          NA
1990-01-01 574823    2.057851
2000-01-01 589141    2.430318
2010-01-01 617594    4.607072
```

Saving as CSV

- Use write.zoo() and read.zoo()

```
> write.zoo(citydata, file = "citydata.csv", sep = ",")
```

- Must re-convert to xts

```
> citydata <- read.zoo("citydata.csv", sep = ",", header = TRUE)
> as.xts(citydata)

               pop pct_growth
1980-01-01 562994         NA
1990-01-01 574823   2.057851
2000-01-01 589141   2.430318
2010-01-01 617594   4.607072
```

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