Review xts fundamentals

CASE STUDY: ANALYZING CITY TIME SERIES DATA IN R

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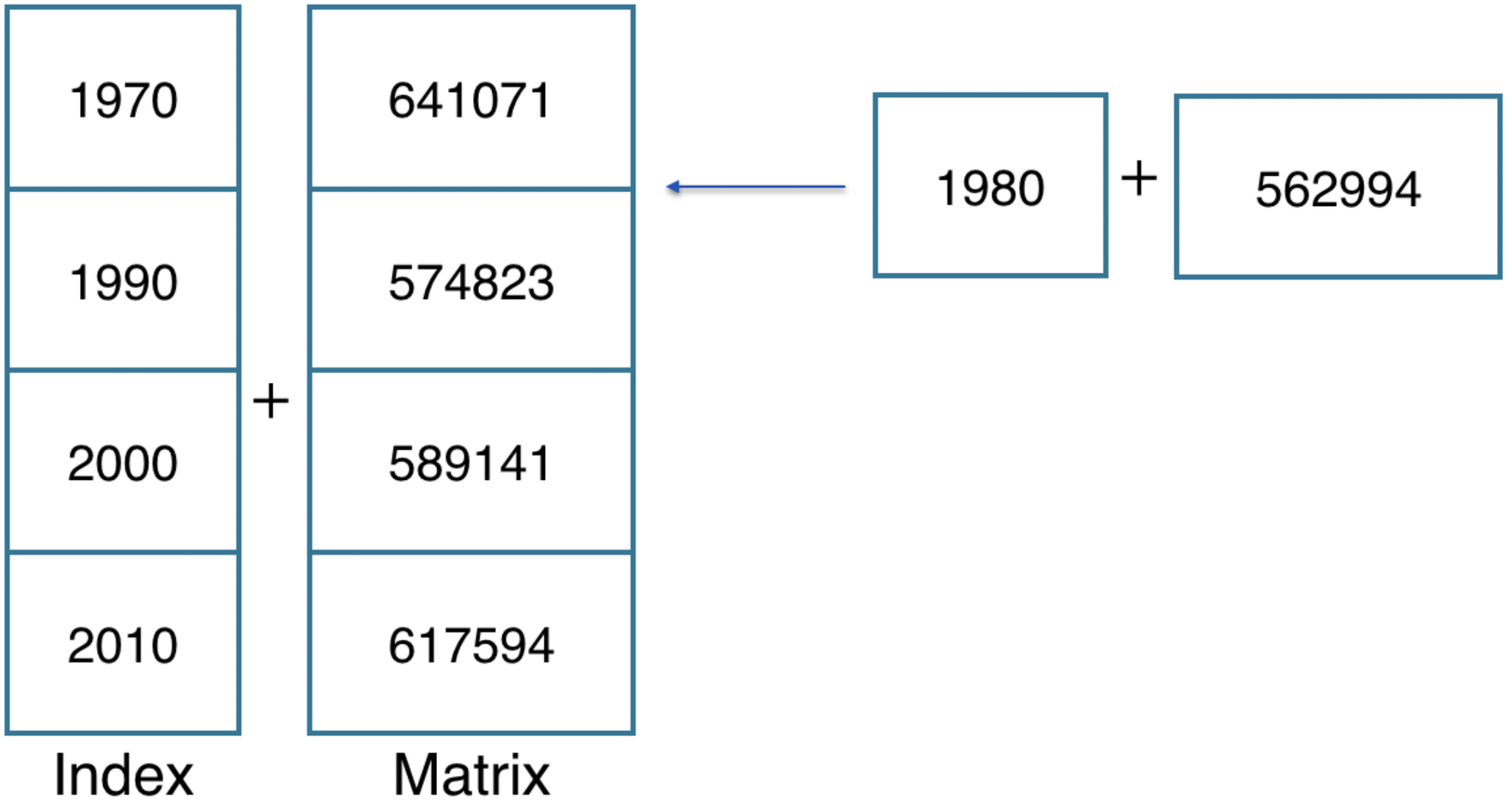
Time series data

- One or more units over many periods

Year	Population
1980	562994
1990	574823
2000	589141
2010	617594

What are xts objects?



Flight data

- Flight delay cancellations, 2010 through 2015

Let's practice!

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Manipulating and visualizing your data

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Qualities of xts objects

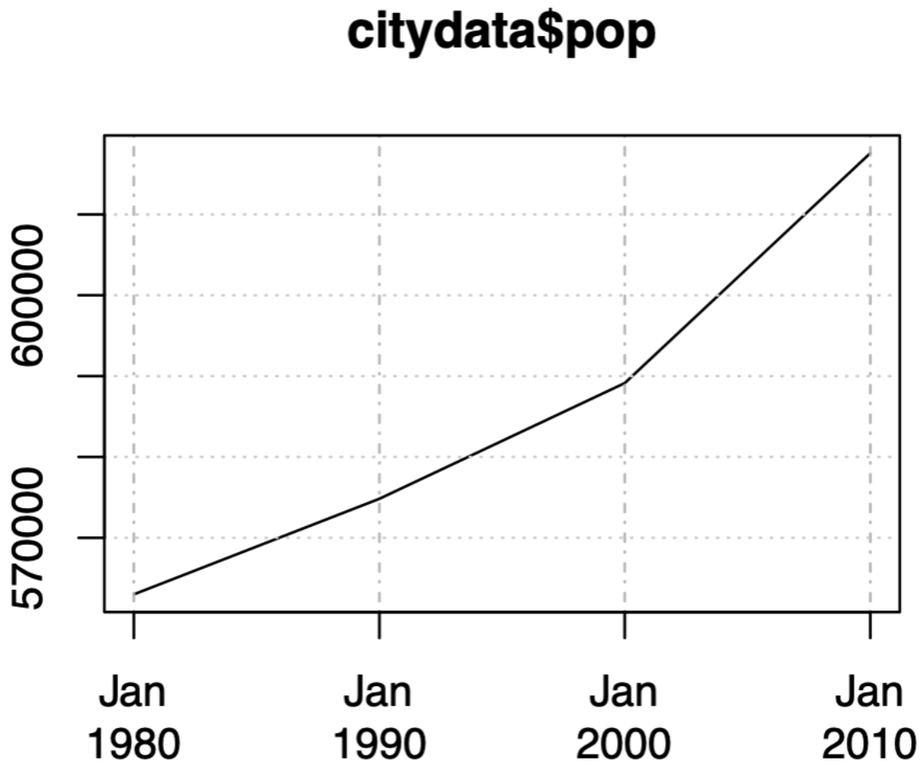
- Periodicity: units of time in your data

```
periodicity(citydata)
```

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

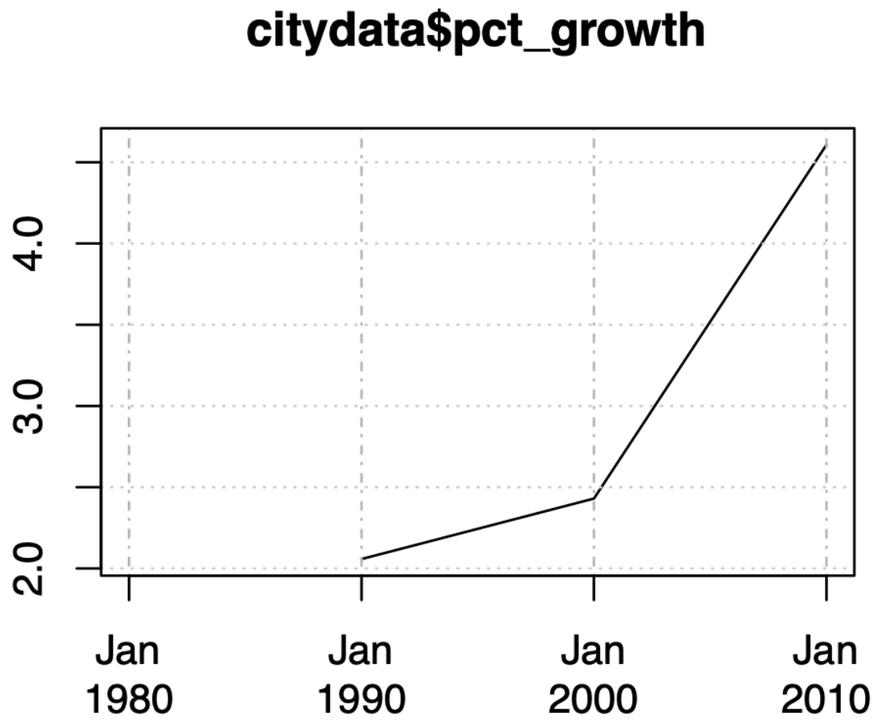
Plotting time series data

```
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

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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
```

Let's practice!

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