MANIPULATING TIME SERIES DATA IN R: CASE STUDIES

Merging Time Series Data by Row

Merging Using rbind()

- xts objects are automatically ordered in time
- Merging xts objects using rbind() preserves order

1980	562994
1990	574823
2000	589141
2010	617594

+

1985	568910
1995	581982
2005	603371

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Weather Data

- Practice with Boston area weather data

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

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Let’s practice!

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Merging Time Series Data by Column

Preparing to Merge

- Check periodicity and coverage

```
> periodicity(temps_xts)
Daily periodicity from 2007-01-01 to 2015-12-31

> periodicity(flights_xts)
Monthly periodicity from 2010-01-01 to 2015-12-01
```

Preparing to Merge

- Subset data to include similar coverage

```
> temps_xts_2 <- temps_xts["2010/2015"]
```

- Convert periodicity

```
> temps_monthly <- to.period(temps_xts_2, period = "months")
```

- Note: Can only convert to a *lower* frequency

Using merge() with xts

- Order of merge() determines order of columns
- Order of rows is based on time index

```
> flights_temps <- merge(flights_xts, temps_monthly)
```

```
> head(flights_temps)

            flights    temps
2010-01-01    8912 36.12903
2010-02-01    8418 37.71429
2010-03-01    9637 42.22581
2010-04-01    9363 51.26667
2010-05-01    9360 56.87097
2010-06-01    9502 63.56667
```

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Time Series Data Workflow

Workflow for Merging

1. Encode all time series objects to xts

```
> data_1_xts <- as.xts(data_1, order.by = index)
```

2. Examine and adjust periodicity

```
> periodicity(data_1_xts)

> to.period(data_1_xts, period = "years")
```

3. Merge xts objects

```
> merged_data <- merge(data_1_xts, data_2_xts)
```

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Let’s practice!