MANIPULATING TIME SERIES DATA IN R: CASE STUDIES

# Merging Time Series Data by Row

# Merging Using rbind()

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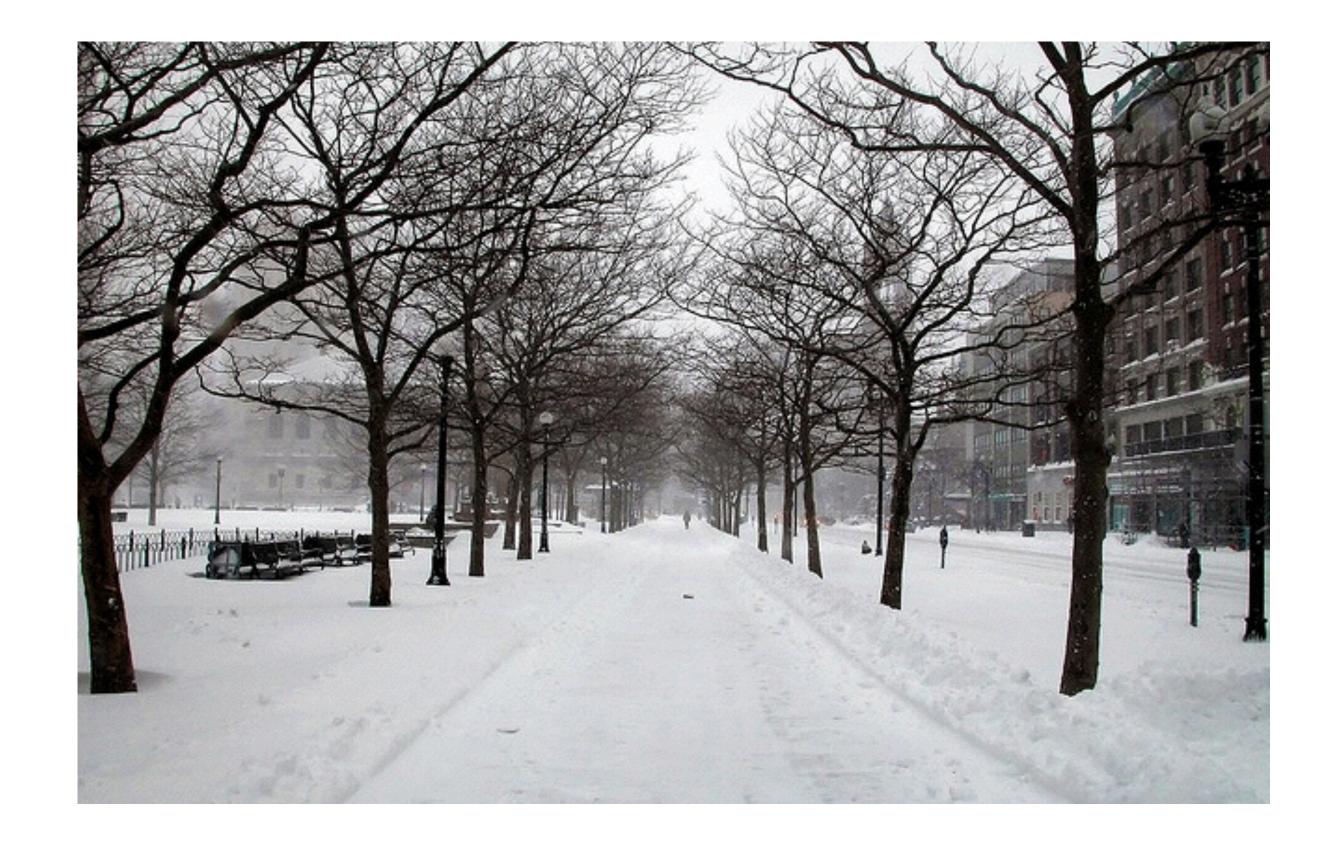
- Merging xts objects using rbind() preserves order

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1980 | 562994 | | | | | 1980 | 562994 |
| | | 1985 | 568910 | | | 1985 | 568910 |
| 1990 | 574823 | | | | | 1990 | 574823 |
| | | 1995 | 581982 | | | 1995 | 581982 |
| 2000 | 589141 | | | | | 2000 | 589141 |
| | | 2005 | 603371 | | | 2005 | 603371 |
| 2010 | 617594 | | | | | 2010 | 617594 |

# Weather Data

- Practice with Boston area weather data

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# Let's practice!

# 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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# Let's practice!

# 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)
```

# Let's practice!