Forecasting: Principles and practice

Chapters 2-3: Time series graphics and decomposition

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```
library('easypackages')
packages = c('reticulate', 'fpp3', 'tidyverse', 'fable')
libraries(packages)

use_condaenv("dtp_shiny_v20", required = TRUE)
getwd()
```

```
import os
import tarfile
import urllib
import pandas as pd
import numpy as np
```

```
df_gas = pd.read_csv('../data/raw/fueltypesall.csv')

# convert date to datetime object
df_gas['Date'] = pd.to_datetime(df_gas['Date'])
```

```
df_gasr = read_csv('../data/raw/fueltypesall.csv')

# convert date to tsibble and then to long format
df_gasr <- df_gasr |>
  pivot_longer(cols = -c(Date, `Fuel Type`, `Type de carburant`),
```

```
                names_to = "city", values_to = "price") |>
  mutate(week= yearweek(Date)) |>
  as_tsibble(index = week, key = c('city', `Fuel Type`))
```

1 Time series patterns

1. **Trend**: a long-term change that does not have to be linear.
2. **Seasonal**: changes that occur for fixed and known periods (e.g., holidays, seasons)
3. **Cyclic**: rises and falls that are not of a fixed frequency (e.g., economic conditions) and last at least 2 years.

2 Time plots

```
# plot gas prices in toronto over time
toronto = df_gasr |>
  filter(city == 'Toronto East/Est')

plot_toronto = autoplot(toronto) +
  labs(y='price') +
  theme_classic()

ggsave("figures/toronto_plot.png", plot = plot_toronto, width = 8, height = 6)
```

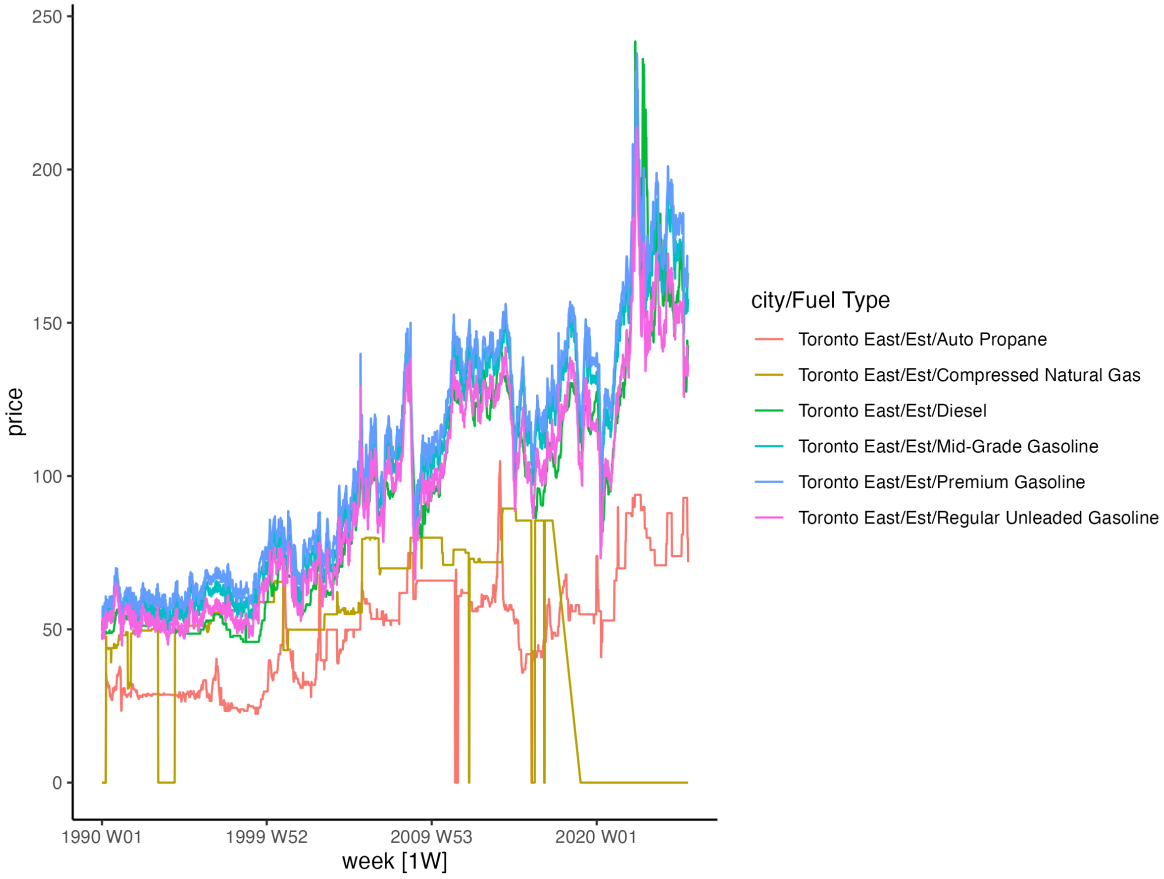

Figure 1: toronto plot

testing