624_wk2_E_Haley

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```
library(fpp3)
```

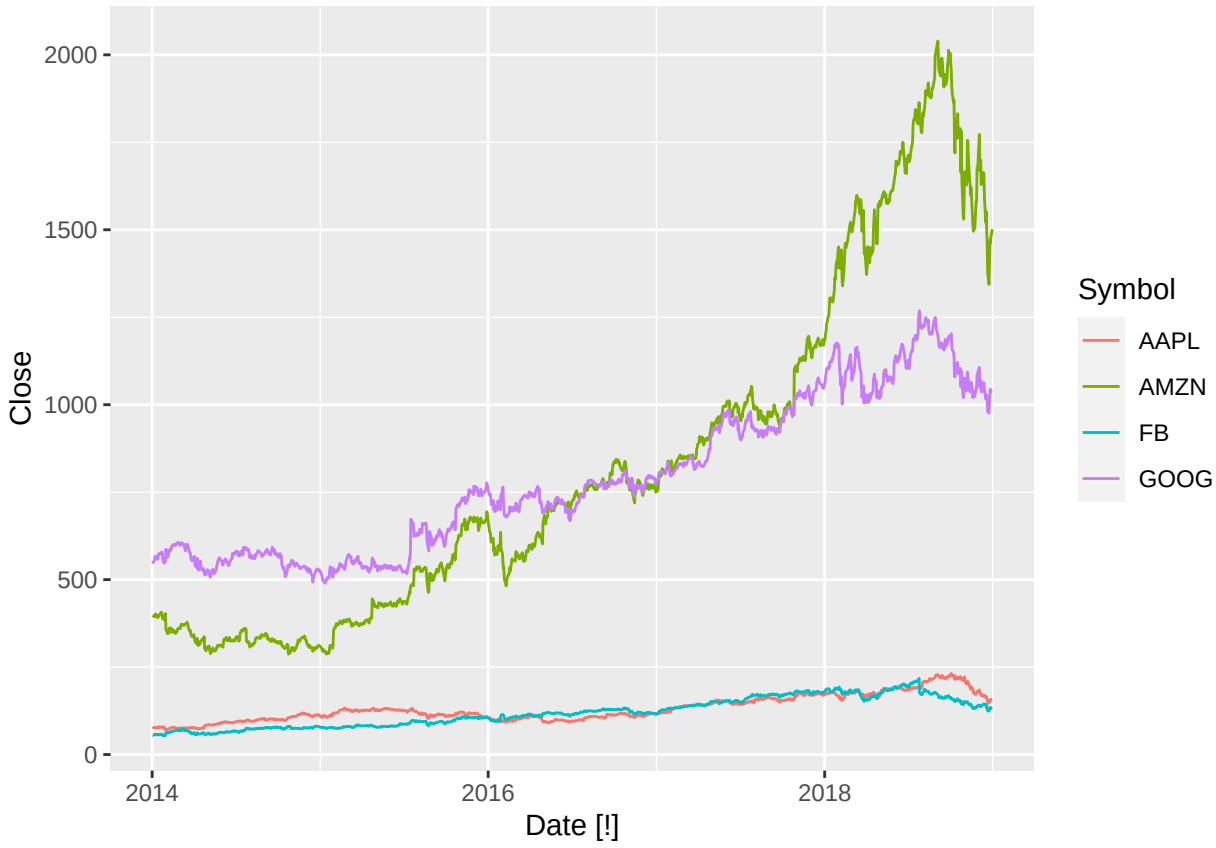
```
## -- Attaching packages --------------------------------------- fpp3 0.4.0 --

## v tibble      3.1.5     v tsibble     1.1.1
## v dplyr       1.0.7     v tsibbledata 0.4.0
## v tidyr       1.1.4     v feasts      0.2.2
## v lubridate   1.8.0     v fable       0.3.1
## v ggplot2     3.3.5

## Warning: package 'tsibbledata' was built under R version 4.0.5

## -- Conflicts ------------------------------------------ fpp3_conflicts --
## x lubridate::date()    masks base::date()
## x dplyr::filter()      masks stats::filter()
## x tsibble::intersect() masks base::intersect()
## x tsibble::interval()  masks lubridate::interval()
## x dplyr::lag()         masks stats::lag()
## x tsibble::setdiff()   masks base::setdiff()
## x tsibble::union()     masks base::union()
```

1) Use the help function to explore what the series `gafa_stock`, `PBS`, `vic_elec` and `pelt` represent.

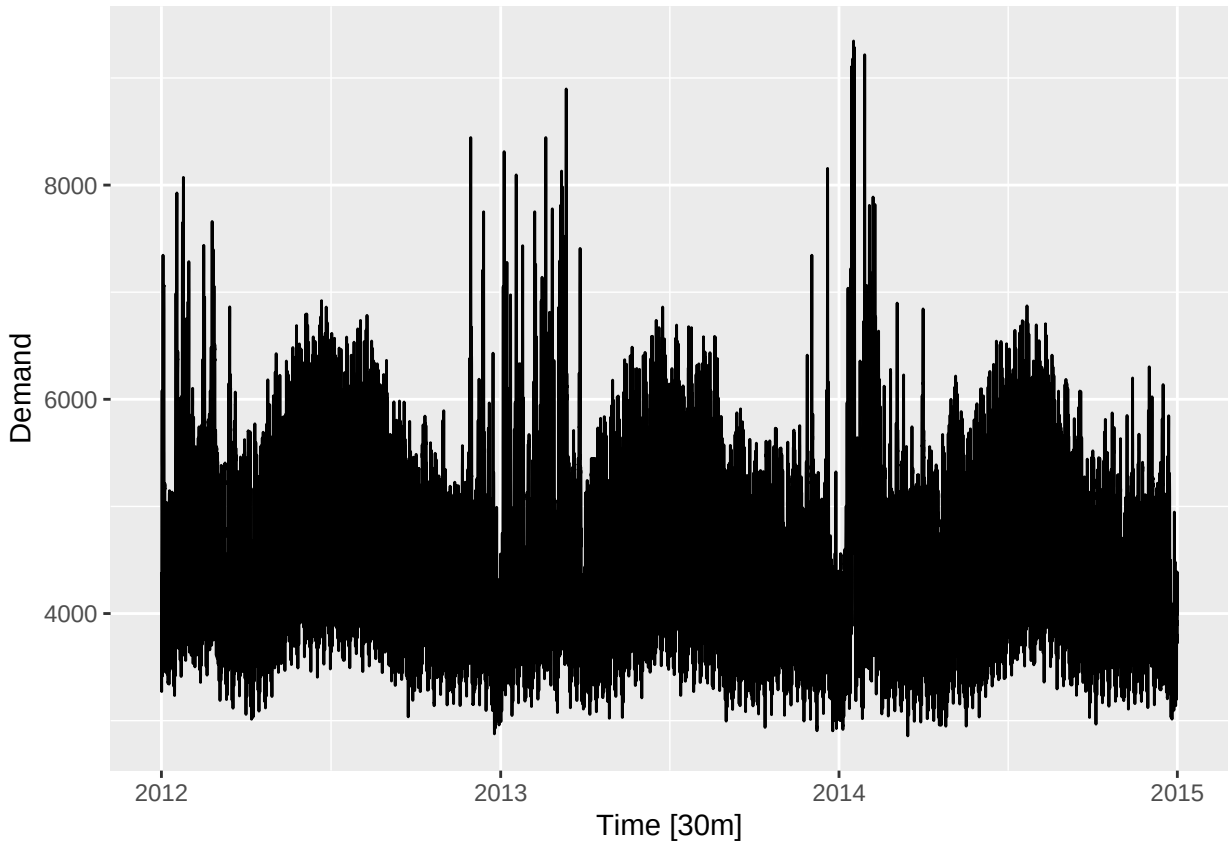
```
#help("gafa_stock")
#help("PBS")
#help("vic_elec")
#help("pelt")
```

a) Use autoplot() to plot some of the series in these data sets.

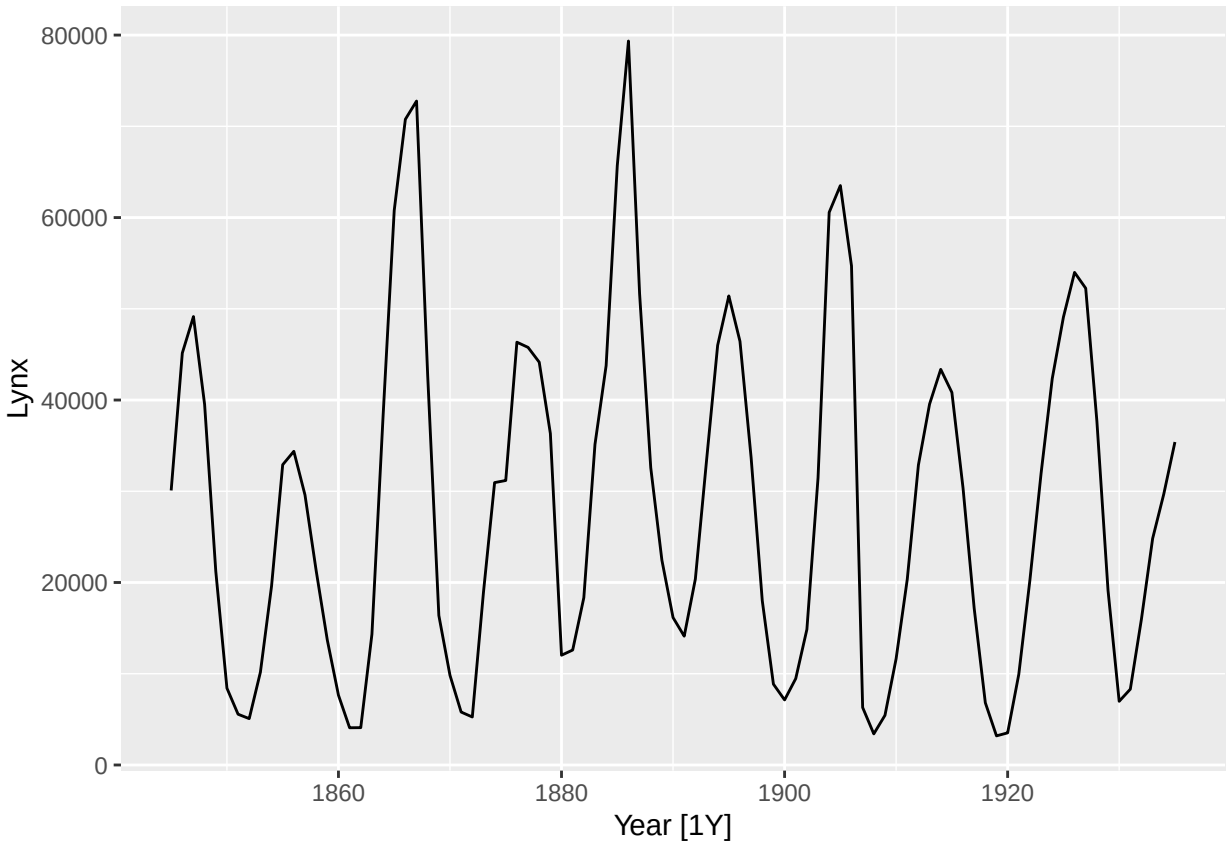
```
autoplot(gafa_stock, .vars = Close)
```



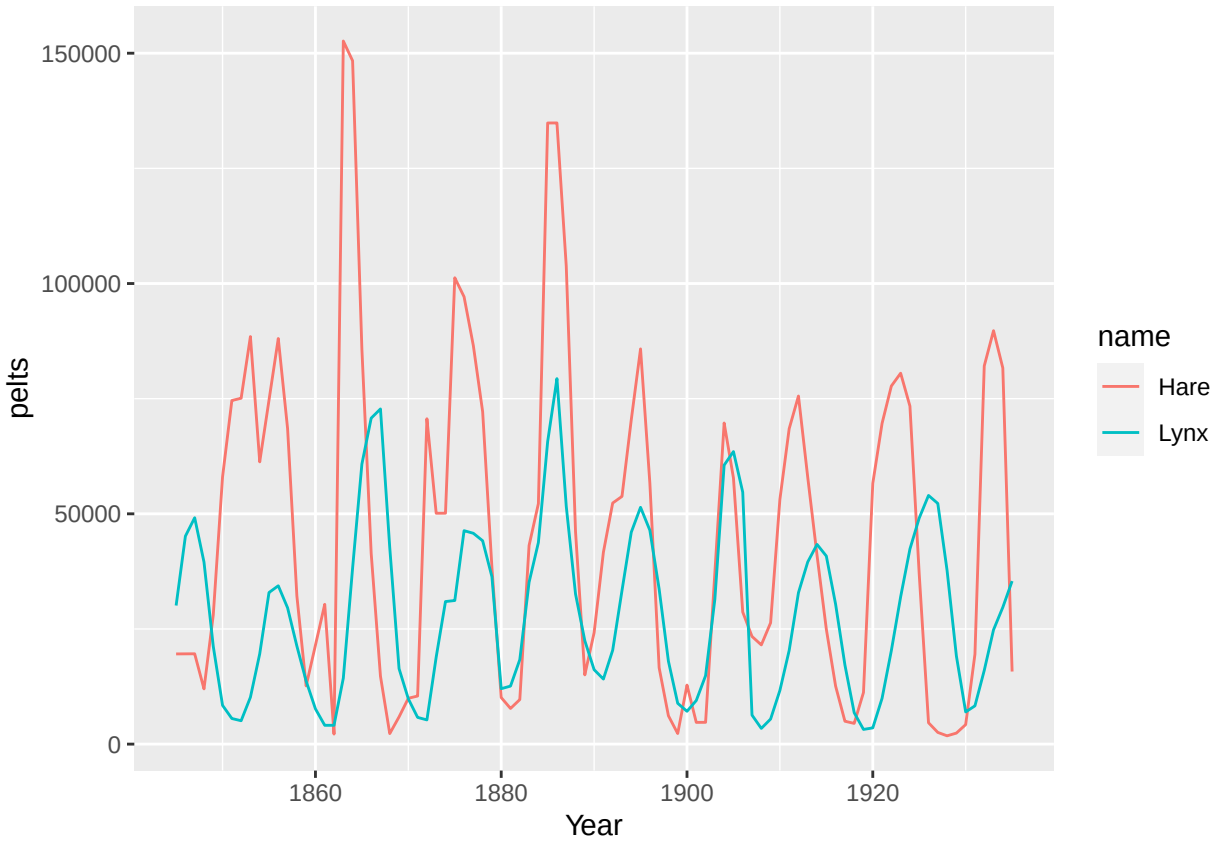

```
autoplot(vic_elec, .vars = Demand)
```




```
autoplot(pelt, .vars = Lynx)
```




```
pelt %>%
  pivot_longer(-Year) %>%
  ggplot(aes(x = Year, y = value, colour = name)) +
  geom_line() +
  labs(y='pelts')
```



b) What is the time interval of each series?

```
interval(pelt)
```

```
## <interval[1]>
## [1] 1Y
```

`gafa_stock`: 1 day

`PBS`: 1 month

`vic_elec`: 30 minutes

`pelt`: 1 year

2) Use filter() to find what days corresponded to the peak closing price for each of the four stocks in `gafa_stock`

```
highs = tibble()
for (stock in unique(gafa_stock$Symbol)) {
  high = gafa_stock %>%
    filter(Symbol==stock) %>%
    filter(Close==max(Close))
  highs = bind_rows(highs, high)
}
data.frame(highs)
```

```
##   Symbol       Date     Open     High      Low    Close Adj_Close   Volume
```

```
## 1   AAPL 2018-10-03  230.05  233.470  229.78  232.07  230.2755 28654800
## 2   AMZN 2018-09-04 2026.50 2050.500 2013.00 2039.51 2039.5100  5721100
## 3     FB 2018-07-25  215.72  218.620  214.27  217.50  217.5000 58954200
## 4   GOOG 2018-07-26 1251.00 1269.771 1249.02 1268.33 1268.3300  2405600
```

3) Download the file `tute1.csv` from the book website

```
sales = read.csv("https://raw.githubusercontent.com/ebhtra/msds-624/main/tute1.csv")
head(sales)
```

```
##      Quarter  Sales AdBudget   GDP
## 1 1981-03-01 1020.2    659.2 251.8
## 2 1981-06-01  889.2    589.0 290.9
## 3 1981-09-01  795.0    512.5 290.8
## 4 1981-12-01 1003.9    614.1 292.4
## 5 1982-03-01 1057.7    647.2 279.1
## 6 1982-06-01  944.4    602.0 254.0
```

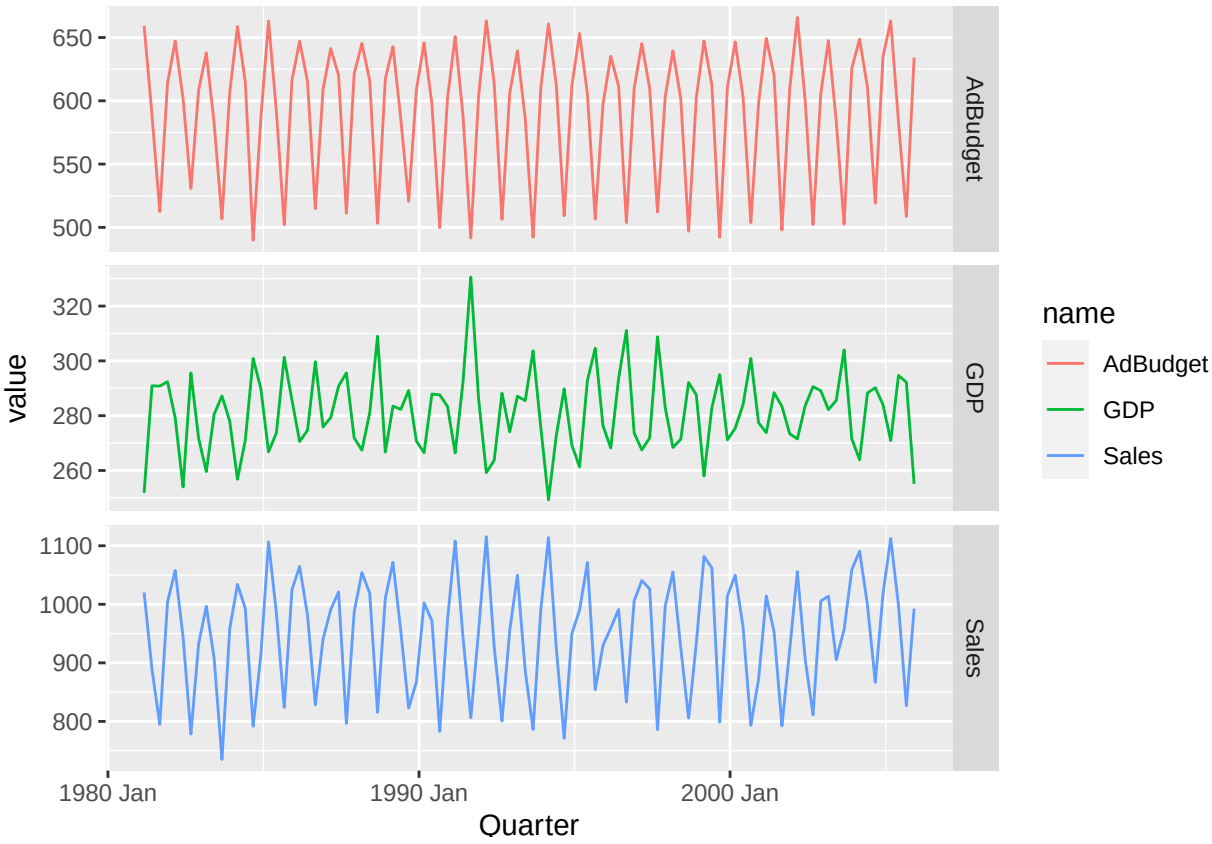
Convert the data to time series

```
mytimeseries <- sales %>%
  mutate(Quarter = yearmonth(Quarter)) %>%
  as_tsibble(index = Quarter)
head(mytimeseries)
```

```
## # A tsibble: 6 x 4 [3M]
##    Quarter Sales AdBudget   GDP
##      <mth> <dbl>    <dbl> <dbl>
## 1 1981 Mar 1020.     659.  252.
## 2 1981 Jun  889.     589   291.
## 3 1981 Sep  795      512.  291.
## 4 1981 Dec 1004.     614.  292.
## 5 1982 Mar 1058.     647.  279.
## 6 1982 Jun  944.     602   254
```

Construct time series plots of each of the three series

```
mytimeseries %>%
  pivot_longer(-Quarter) %>%
  ggplot(aes(x = Quarter, y = value, colour = name)) +
  geom_line() +
  facet_grid(name ~ ., scales = "free_y")
```



6) Create time plots of the following four time series: `Bricks` from `aus_production`, `Lynx` from `pelt`, `Close` from `gafa_stock`, `Demand` from `vic_elec`.

Use ? (or help()) to find out about the data in each series. For the last plot, modify the axis labels and title.