

Stat. 651 Homework 2

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Chapter 14 Exercises

```
library(pacman)

p_load(tidyverse, macleish, lubridate, mdsr, DT, palmerpenguins)
```

Problem 3:

The `macleish` package contains weather data collected every 10 minutes in 2015 from two weather stations in Whately, Massachusetts.

Using the `ggplot2` package, create a data graphic that displays the average temperature over each 10-minute interval (`temperature`) as a function of time (`when`) from the `whately_2015` dataframe. Create annotations to include context about the four seasons: the date of the vernal and autumnal equinoxes, and the summer and winter solstices.

```
#whately_2015 %>% select(when, temperature)

seasons_2015 <- tibble(
  when = (ymd(c("2015 March 20", "2015 June 21", "2015 September 23", "2015 December 21"))
  season = c("Spring", "Summer", "Fall", "Winter")
)
#seasons_2015

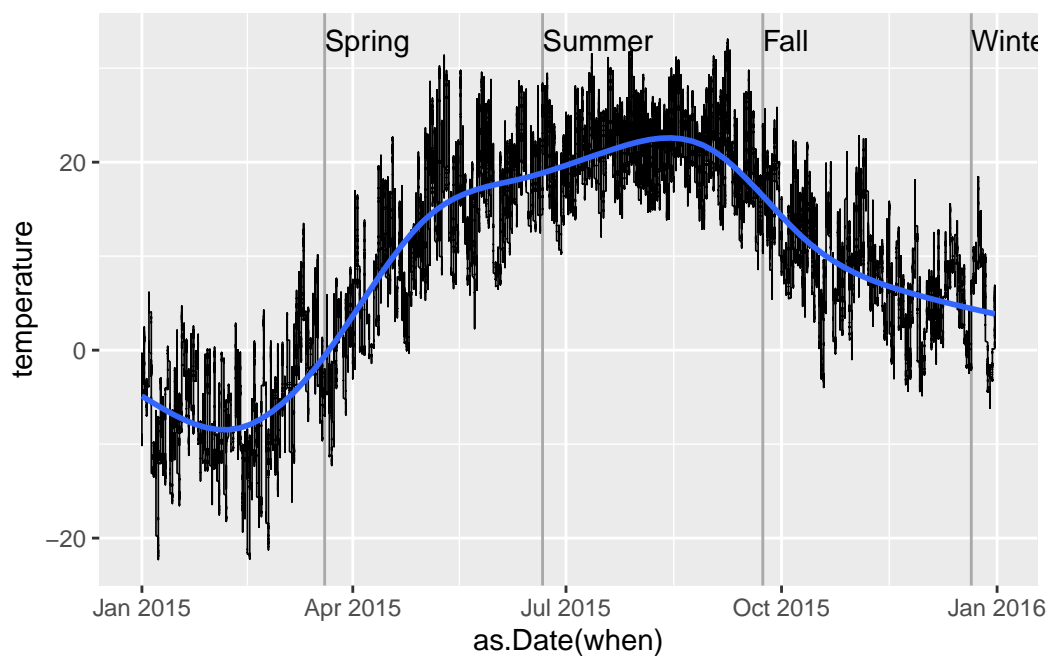
whately_plot <- whately_2015 %>% select(when, temperature) %>%
  ggplot(aes(y = temperature, x = as.Date(when))) +
  geom_vline(data = seasons_2015, color = "darkgray", aes( xintercept = as.Date(when) ) ) +
  geom_text(data = seasons_2015, aes(y = 33, label = season, hjust = "left")) +
  geom_line(size = 0.3) +
  geom_smooth() +
```

```
scale_x_date()
```

Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
i Please use `linewidth` instead.

```
whately_plot
```

```
`geom_smooth()` using method = 'gam' and formula = 'y ~ s(x, bs = "cs")'
```



Problem 4

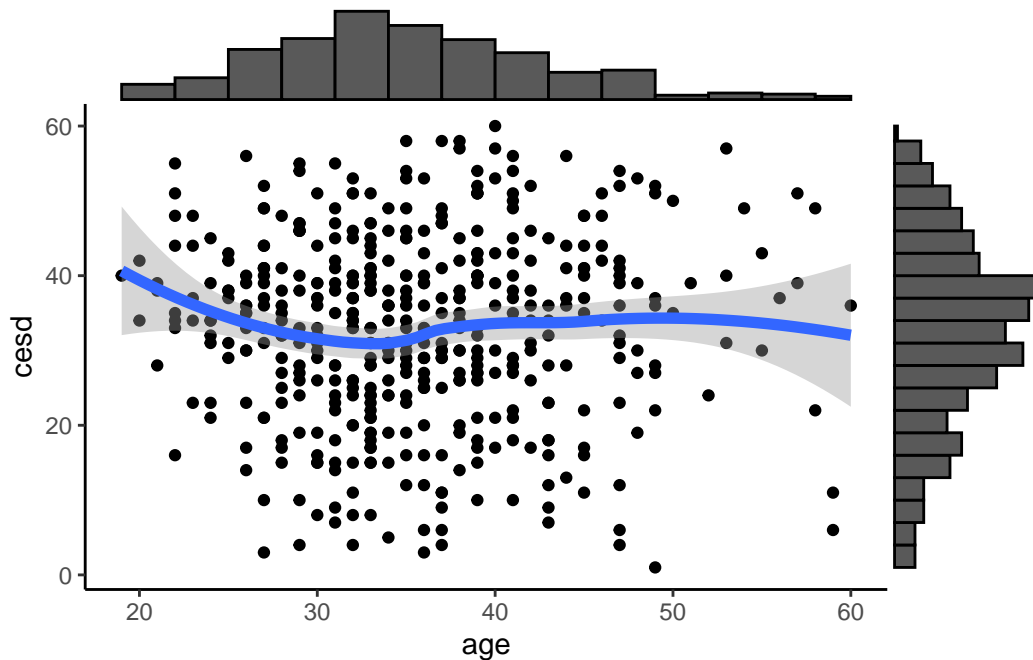
Modify the restaurant violations Shiny app so that it displays a table of the number of restaurants within a given type of cuisine along with a count of restaurants (as specified by the dba variable). (Hint: Be sure not to double count. The dataset should include 842 unique pizza restaurants in all boroughs and 281 Caribbean restaurants in Brooklyn.)

[violations_app](#)

Problem 6

The following code generates a scatterplot with marginal histograms.

```
library(mosaicData)
p <- ggplot(HELPrct, aes(x = age, y = cesd)) +
  geom_point() +
  theme_classic() +
  stat_smooth(method = "loess", formula = y ~ x, size = 2)
ggExtra::ggMarginal(p, type = "histogram", binwidth = 3)
```



```
#p
```

Find an example where such a display might be useful. Be sure to interpret your graphical display.

Problem 7

Using data from the `palmerpenguins` package, create a Shiny app that displays measurements from the `penguins` dataframe. Allow the user to select a species or a gender, and to choose between various attributes on a scatterplot. (Hint: examples of similar apps can be found at the Shiny gallery).

[Penguin App](#)

Problem 8

Create a Shiny app to display an interactive time series plot of the `macleish` weather data. Include a selection box to alternate between data from the `whately_2015` and `orchard_2015` weather stations. Add a selector of dates to include in the display. Do you notice any irregularities?

[macleish App](#)