Assignment 5

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2024-11-01

```r
library(tidyverse)
library(lubridate)
library(mosaicData)
```

Exercise 1

Convert the following to date or date/time objects.

a) September 13, 2010.

```r
mdy("September 13, 2010")
```

```
## [1] "2010-09-13"
```

b) Sept 13, 2010.

```r
mdy("Sept 13, 2010")
```

```
## Warning: All formats failed to parse. No formats found.
```

```
## [1] NA
```

c) Sep 13, 2010.

```r
mdy("Sep 13, 2010")
```

```
## [1] "2010-09-13"
```

d) S 13, 2010. Comment on the month abbreviation needs.

```r
mdy("S 13, 2010")
```

```
## Warning: All formats failed to parse. No formats found.
```

```
## [1] NA
```

"s" is not descriptive enough to reliably tell what it represents.

e) 07-Dec-1941.

```r
mdy("07-Dec-1941")
```

```
## [1] "2041-07-19"
```

f) 1-5-1998. Comment on why you might be wrong.

```r
mdy("1-5-1998")
```

```
## [1] "1998-01-05"
```

Can be reading the month as the day or the day as month

g) 21-5-1998. Comment on why you know you are correct.

```r
dmy("21-5-1998")
```

```
## [1] "1998-05-21"
```

Because there aren't 21 months so 21 has to be day and the year is obvious so remaining is days therefore the order is dmy.

h) 2020-May-5 10:30 am

```r
ymd_hm("2020-May-5 10:30 am")
```

```
## [1] "2020-05-05 10:30:00 UTC"
```

i) 2020-May-5 10:30 am PDT (ex Seattle)

```r
ymd_hm("2020-May-5 10:30 am", tz = "US/Pacific")
```

```
## [1] "2020-05-05 10:30:00 PDT"
```

j) 2020-May-5 10:30 am AST (ex Puerto Rico)

```r
ymd_hm("2020-May-5 10:30 am", tz = "America/Puerto_Rico")
```

```
## [1] "2020-05-05 10:30:00 AST"
```

Exercise 3

Suppose you have arranged for a phone call to be at 3 pm on May 8, 2025 at Arizona time. However, the recipient will be in Auckland, NZ. What time will it be there?

```r
Call.time <- mdy_hm("May 8, 2025 15:00", tz = "US/Arizona")
recipiant.TZ <- "Pacific/Auckland"

with_tz(Call.time, recipiant.TZ)
```

```
## [1] "2025-05-09 10:00:00 NZST"
```

Exercise 5

It turns out there is some interesting periodicity regarding the number of births on particular days of the year.

a) Using the `mosaicData` package, load the data set `Births78` which records the number of children born on each day in the United States in 1978. Because this problem is intended to show how to calculate the information using the `date`, remove all the columns *except* `date` and `births`.

```
data("Births78")

Births78 <- Births78 %>%
  select(date, births)
```

b) Graph the number of `births` vs the `date` with date on the x-axis. What stands out to you? Why do you think we have this trend?

```
ggplot(data = Births78, aes(x = date, y = births ))+
  geom_point()
```
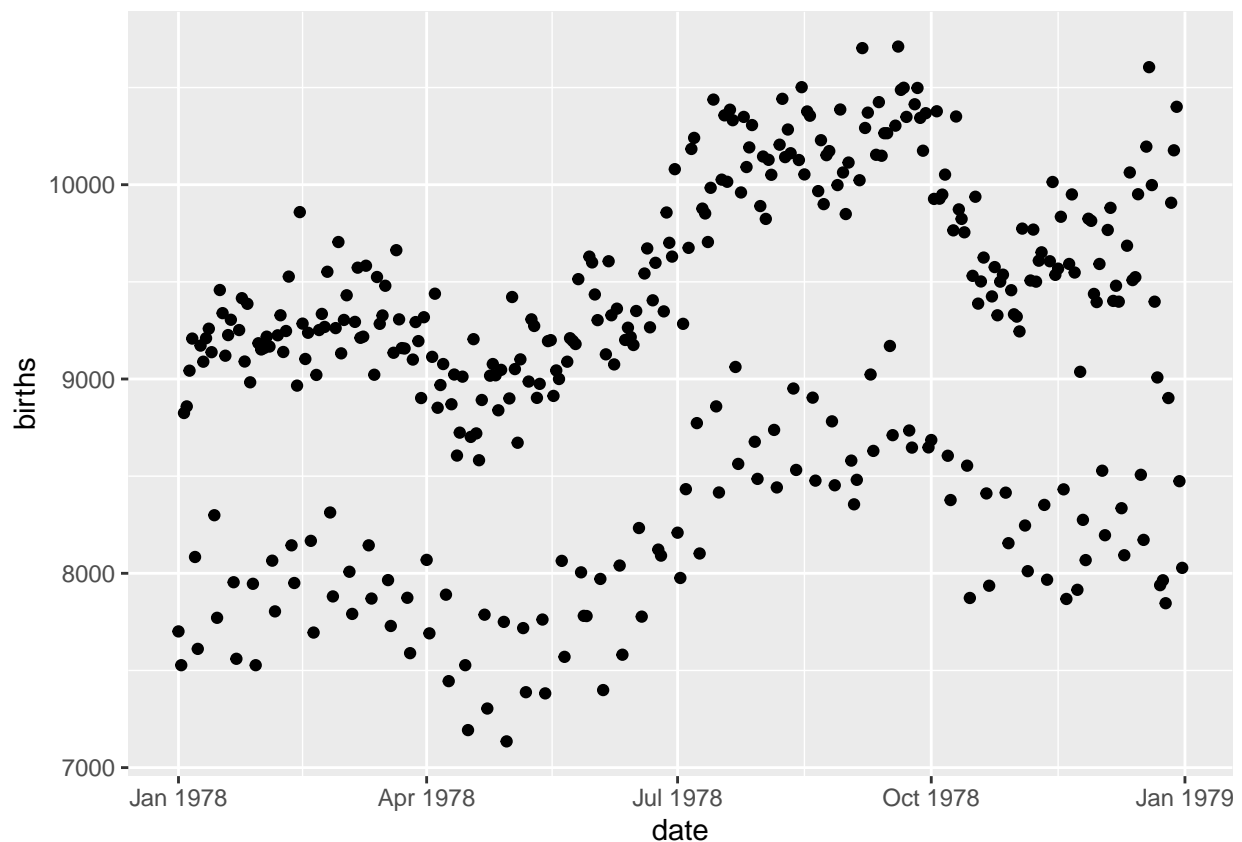

I notice two things one being that there seems to be inconsistencies throughout the week my guess would be that the weekends have less births cause nobody wants to go to the hospital on the weekend.secondly and overall uptrend with a peak in jul-oct my guess is due to the Christmas/new years holidays.

c) To test your assumption, we need to figure out the what day of the week each observation is. Use `dplyr::mutate` to add a new column named `dow` that is the day of the week (Monday, Tuesday, etc). This calculation will involve some function in the `lubridate` package and the `date` column.

3

```
Births78 <- Births78 %>%
  mutate(dow = wday(date, label = TRUE))
```

d) Plot the data with the point color being determined by the day of the week variable.

```
ggplot(data = Births78, aes(x = date, y = births ))+
  geom_point(aes(colour = dow))
```
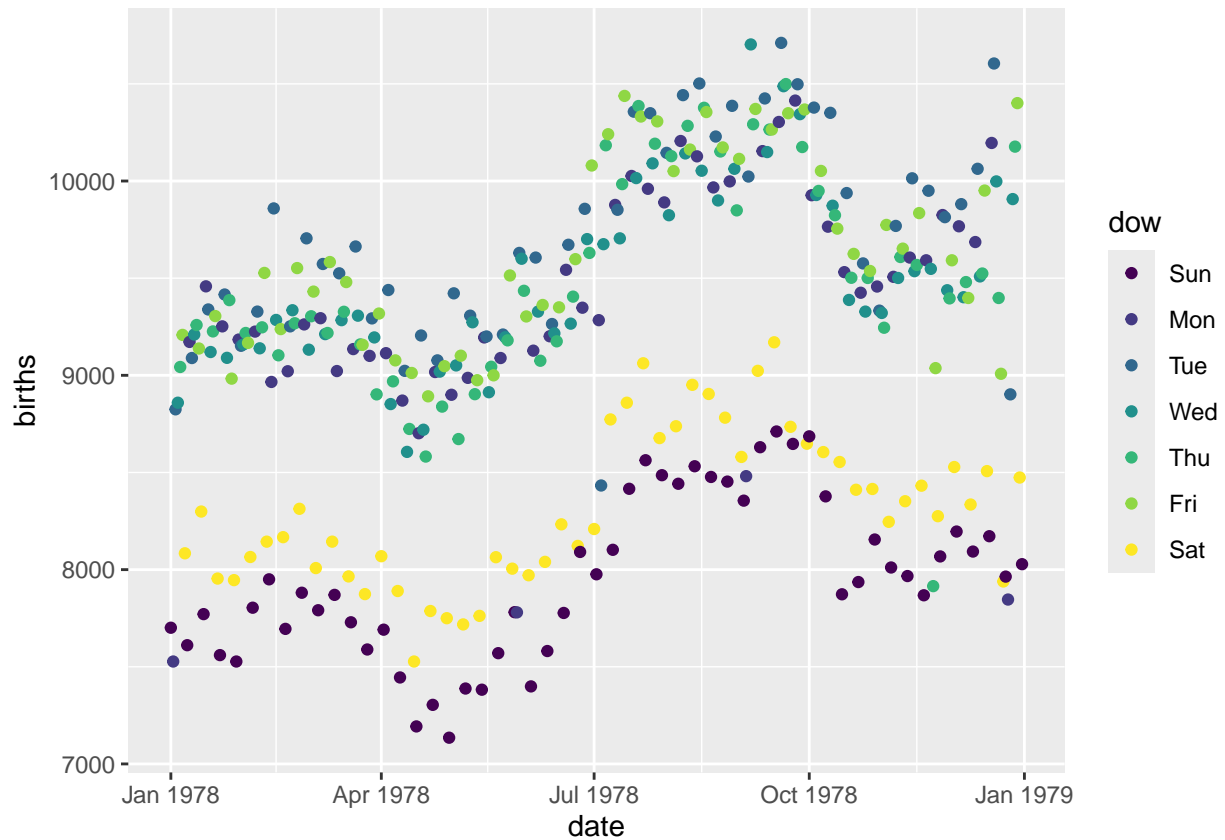

Exercise 2 (Optional)

Using your date of birth (ex Sep 7, 1998) and today's date calculate the following *Write your code in a manner that the code will work on any date after you were born.*:

a) Calculate the date of your 64th birthday.

```
My.DOB <- mdy("feb 21 2004")
My.DOB + years(64)
```

```
## [1] "2068-02-21"
```

b) Calculate your current age (in years). *Hint: Check your age is calculated correctly if your birthday was yesterday and if it were tomorrow!*

4

```r
AGE <- interval(My.DOB,today())
AGE.2 <- as.period(AGE)
AGE.2
```

```
## [1] "20y 8m 11d 0H 0M 0S"
```

c) Using your result in part (b), calculate the date of your next birthday.

```r
Age.1year <- year(AGE.2)+1
Next.Bday <- My.DOB + years(Age.1year)
Next.Bday
```

```
## [1] "2025-02-21"
```

d) The number of *days* until your next birthday.

```r
time.bet <- interval(today(),Next.Bday)
as.period(time.bet,unit = "days")
```

```
## [1] "112d 0H 0M 0S"
```

f) The number of *months* and *days* until your next birthday.

```r
time.bet <- interval(today(),Next.Bday)
as.period(time.bet,unit = "months")
```

```
## [1] "3m 20d 0H 0M 0S"
```