Homework_one

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```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --

## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.6     v dplyr   1.0.7
## v tidyr   1.1.4     v stringr 1.4.0
## v readr   2.1.1     v forcats 0.5.1

## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(lubridate)
```

```
##
## Attaching package: 'lubridate'

## The following objects are masked from 'package:base':
##
##     date, intersect, setdiff, union
```

```
library(dplyr)
```

1 Use and show R coding to find the number of days from June 6th 2020 to July 14th 2021

```
two_yearago <- ymd(20200606)

last_year <- ymd(20210714)

two_yearago - last_year
```

```
## Time difference of -403 days
```

2 Use and show R coding to confirm that the year 1988 was a leap year.

```
year_1988 <- ymd(19880101)
year_1989 <- ymd(19890101)
year_1988 - year_1989
```

```
## Time difference of -366 days
```

```
# the year 1988 was a leap year since it had 366 days rather than 365
```

3 Use and show R coding to confirm that the year 1989 was not a leap year

```
year_1990 <- ymd(19900101)
year_1989 <- ymd(19890101)
year_1990 - year_1989
```

```
## Time difference of 365 days
```

```
# the year 1989 was not a leap year since it had 365 days rather than 365
```

4 Why is there months() but no dmonths ? (Answer in 3 to four sentences)

Using durations such as dhours or dminutes or ddays gives you the exact number in seconds. You can't use dmonths since each month does that have the same amount of days so theres not a standard that can be multiplied to find the exact number of seconds. When using months() you are just saying the amount of months or which month.

5 John was born April 11th, 1962. Use and show R coding to determine how old John is in years

```
birthday <- ymd(19620411)
(today() %--% birthday)%/% years(1)
```

```
## [1] -59
```

```
# he is 59 years old
```

6 Modify the flights_dt coding in the notes or the book to obtain the following partial data table shown below. Show all required coding. (Most of the coding needed is provided in the notes)

```
library(nycflights13)

make_datetime_100 <- function(year, month, day, time) {
  make_datetime(year, month, day, time %/% 100, time %% 100)
}

flights %>%
  filter(!is.na(dep_time), !is.na(arr_time)) %>%
  mutate(
    dep_time = make_datetime_100(year, month, day, dep_time),
    arr_time = make_datetime_100(year, month, day, arr_time),
    sched_dep_time = make_datetime_100(year, month, day, sched_dep_time),
    sched_arr_time = make_datetime_100(year, month, day, sched_arr_time)
  )  -> 

flights_dt
flights_dt
```

```
## # A tibble: 328,063 x 19
##     year month   day dep_time            sched_dep_time      dep_delay
##    <int> <int> <int> <dttm>              <dttm>                  <dbl>
##  1  2013     1     1 2013-01-01 05:17:00 2013-01-01 05:15:00         2
##  2  2013     1     1 2013-01-01 05:33:00 2013-01-01 05:29:00         4
##  3  2013     1     1 2013-01-01 05:42:00 2013-01-01 05:40:00         2
##  4  2013     1     1 2013-01-01 05:44:00 2013-01-01 05:45:00        -1
##  5  2013     1     1 2013-01-01 05:54:00 2013-01-01 06:00:00        -6
##  6  2013     1     1 2013-01-01 05:54:00 2013-01-01 05:58:00        -4
##  7  2013     1     1 2013-01-01 05:55:00 2013-01-01 06:00:00        -5
##  8  2013     1     1 2013-01-01 05:57:00 2013-01-01 06:00:00        -3
##  9  2013     1     1 2013-01-01 05:57:00 2013-01-01 06:00:00        -3
## 10  2013     1     1 2013-01-01 05:58:00 2013-01-01 06:00:00        -2
## # ... with 328,053 more rows, and 13 more variables: arr_time <dttm>,
## #   sched_arr_time <dttm>, arr_delay <dbl>, carrier <chr>, flight <int>,
## #   tailnum <chr>, origin <chr>, dest <chr>, air_time <dbl>, distance <dbl>,
## #   hour <dbl>, minute <dbl>, time_hour <dttm>
```

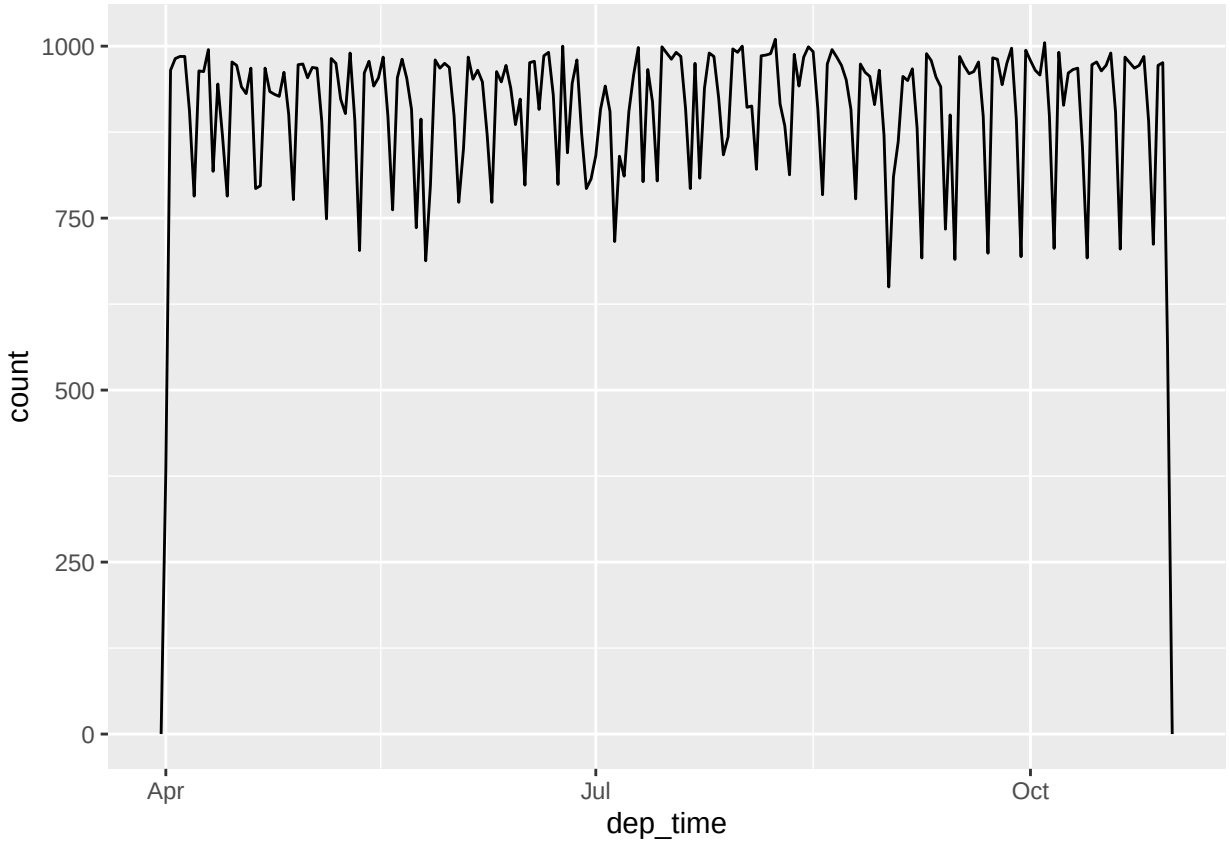
```
flights_dt %>%
  select(origin, dest, carrier, arr_time, dep_time) -> new_flights
new_flights
```

```
## # A tibble: 328,063 x 5
##    origin dest  carrier arr_time            dep_time
```

```
##    <chr>  <chr> <chr>   <dttm>              <dttm>
##  1 EWR    IAH   UA      2013-01-01 08:30:00 2013-01-01 05:17:00
##  2 LGA    IAH   UA      2013-01-01 08:50:00 2013-01-01 05:33:00
##  3 JFK    MIA   AA      2013-01-01 09:23:00 2013-01-01 05:42:00
##  4 JFK    BQN   B6      2013-01-01 10:04:00 2013-01-01 05:44:00
##  5 LGA    ATL   DL      2013-01-01 08:12:00 2013-01-01 05:54:00
##  6 EWR    ORD   UA      2013-01-01 07:40:00 2013-01-01 05:54:00
##  7 EWR    FLL   B6      2013-01-01 09:13:00 2013-01-01 05:55:00
##  8 LGA    IAD   EV      2013-01-01 07:09:00 2013-01-01 05:57:00
##  9 JFK    MCO   B6      2013-01-01 08:38:00 2013-01-01 05:57:00
## 10 LGA    ORD   AA      2013-01-01 07:53:00 2013-01-01 05:58:00
## # ... with 328,053 more rows
```

7 Now, using your table from #6, produce the frequency plot shown which conveys frequency counts for the months of April, July, and October for the year 2013

```
new_flights %>%
  filter(dep_time >= ymd(20130401) & dep_time <= ymd(20131030)) %>%
  ggplot(aes(dep_time))+
  geom_freqpoly(binwidth = 86400)
```



8 Now use dplyr functions to produce a data table that shows arrival times for American Airlines at the

Dallas Fort Worth Airport from the LaGuardia airport in New York. Your output should show rows 115 to 125.

```
new_flights %>%
  select(origin, dest, carrier, arr_time) %>%
  filter(origin == "LGA",
         dest == "DFW",
         carrier == "AA") %>%
  slice(115:125)
```

```
## # A tibble: 11 x 4
##    origin dest  carrier arr_time
##    <chr>  <chr> <chr>   <dttm>
##  1 LGA    DFW   AA      2013-01-09 16:16:00
##  2 LGA    DFW   AA      2013-01-09 19:17:00
##  3 LGA    DFW   AA      2013-01-09 19:36:00
##  4 LGA    DFW   AA      2013-01-09 20:53:00
##  5 LGA    DFW   AA      2013-01-09 22:24:00
##  6 LGA    DFW   AA      2013-01-10 08:37:00
##  7 LGA    DFW   AA      2013-01-10 10:20:00
##  8 LGA    DFW   AA      2013-01-10 11:22:00
##  9 LGA    DFW   AA      2013-01-10 12:16:00
## 10 LGA    DFW   AA      2013-01-10 13:19:00
## 11 LGA    DFW   AA      2013-01-10 13:23:00
```

9 Using the first two observational date time designations from your #8 table, Use and show R code to confirm that there are 181 minutes time intervals between them.

```
row115 <- ymd_hms("2013-01-09 16:16:00")
row116 <- ymd_hms("2013-01-09 19:17:00")
(row116 -row115) / dminutes(1)
```

```
## [1] 181
```