# Untitled

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```
library(dplyr)
library(tidyr)
library(lubridate)
library(stringr)
library(ggplot2)
```

## Q1

```
Survey <- read.csv('https://www.lock5stat.com/datasets3e/StudentSurvey.csv', na.strings=c('',' '))
Survey_filter <- Survey %>% drop_na(Sex,Year)
Response_count <- Survey_filter %>% count(Sex, Year)
Response_counts <- Response_count %>%
  mutate(Year = factor(Year, levels = c("First Year", "Sophomore", "Junior", "Senior")))
Response_counts
```

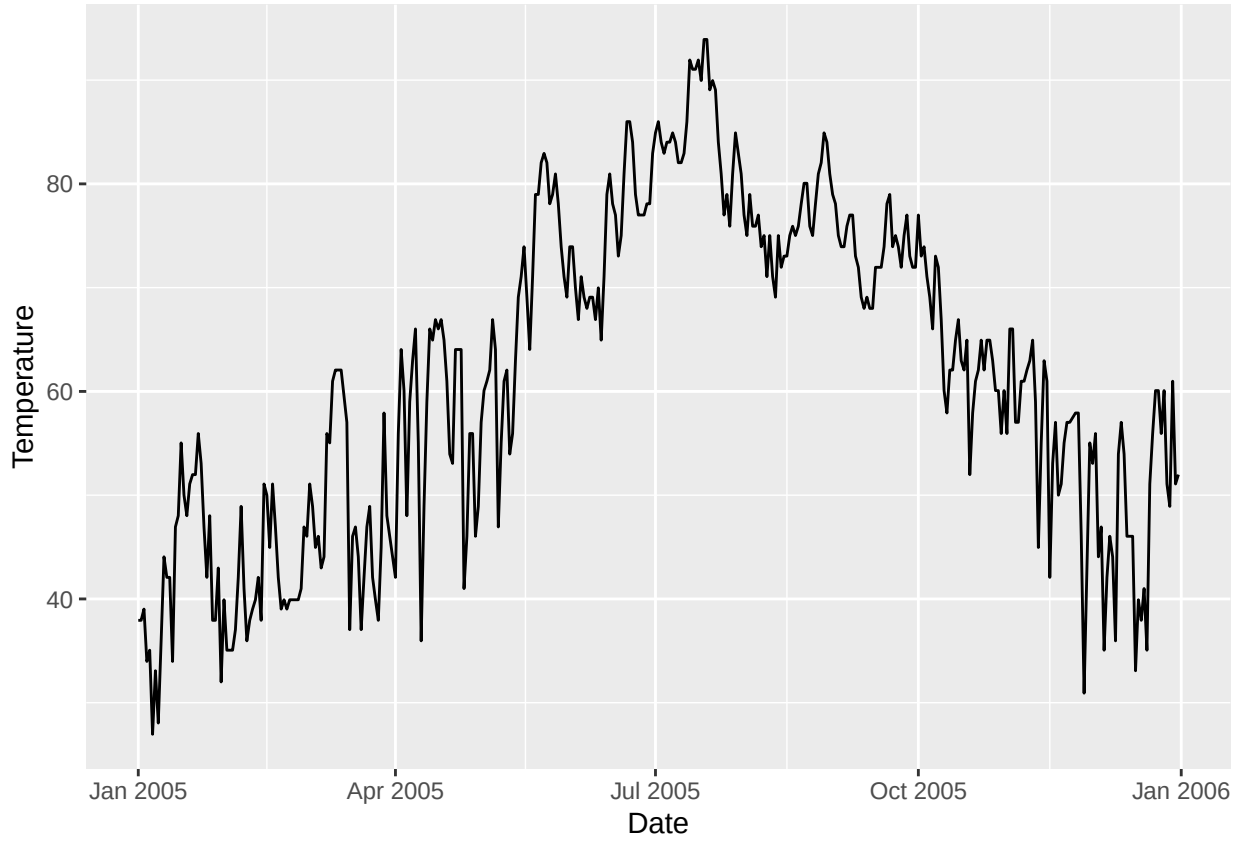
```
##   Sex      Year  n
## 1   F      <NA> 43
## 2   F    Junior 18
## 3   F    Senior 10
## 4   F Sophomore 96
## 5   M      <NA> 51
## 6   M    Junior 17
## 7   M    Senior 26
## 8   M Sophomore 99
```

```
Response_table <- Response_counts %>%
  pivot_wider(names_from = Year, values_from = n)

colnames(Response_table) <- c("Gender", "First Year", "Sophomore", "Junior", "Senior")
Response_table
```

```
## # A tibble: 2 x 5
##   Gender `First Year` Sophomore Junior Senior
##   <chr>         <int>     <int>  <int>  <int>
## 1 F                43        18     10     96
## 2 M                51        17     26     99
```

### Q2a

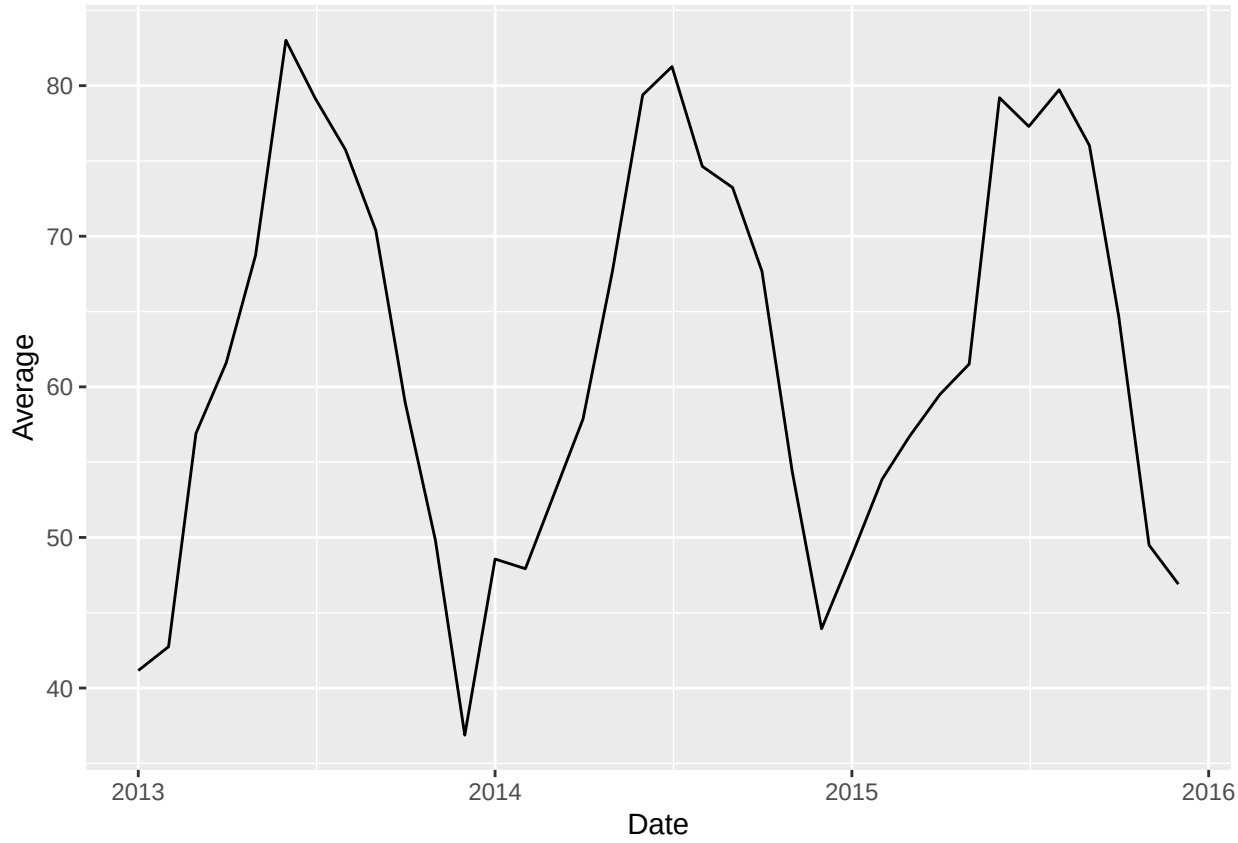
```
url <- "https://raw.githubusercontent.com/dereksonderegger/444/master/data-raw/FlagMaxTemp.csv"
data <- read.csv(url)
dataMax  <- data %>% filter(Year == 2005)

dataPivot <- dataMax %>% pivot_longer(
    X1:X31,                 # which columns to apply this to
    names_to  = 'Day',    # What should I call the column of old column names
    values_to = 'Temperature')

dataClean  <-dataPivot %>% pull(Day) %>% str_replace(pattern='X', replacement='')

dataCleanTemp <- dataPivot %>% mutate(Day=dataClean, Year=as.character(Year), Month =as.character(Month
dataCleanTemp1 <-dataCleanTemp %>% mutate(Date=lubridate::ymd(paste(Year,Month,Day)))



dataCleanTemp1 %>% ggplot(aes(x=Date, y=Temperature)) +geom_line()
```




## Q2b Create a line graph that gives the monthly average maximum temperature for 2013 - 2015. Again the x-axis should be the date and the axis spans 3 years.

```
dataPivot <- data %>% filter(between(Year,2013,2015)) %>%pivot_longer(
    X1:X31,                 # which columns to apply this to
```

```
    names_to  = 'Day',    # What should I call the column of old column names
    values_to = 'Temperature') %>% group_by(Year,Month) %>% drop_na()

dataCleanSum <- dataPivot %>% summarise(Average=mean(Temperature), .groups='drop') %>% mutate(
  Date = lubridate::ym(paste(Year,Month))
)

dataCleanSum %>% ggplot(aes(x=Date, y=Average)) +geom_line()
```




##Q4 Using cbind,rbind and join

```
A <-  tribble(
~Name, ~Car,
'Alice', 'Ford F150',
'Bob',   'Tesla Model III',
'Charlie', 'VW Bug')

B <- tribble(
 ~First.Name, ~Pet,
 'Bob',  'Cat',
 'Charlie', 'Dog',
'Alice', 'Rabbit')
AB_cbind <- cbind(A,B)
AB_cbind
```

```
##      Name             Car First.Name    Pet
```

```
## 1   Alice       Ford F150        Bob    Cat
## 2     Bob Tesla Model III    Charlie    Dog
## 3 Charlie          VW Bug      Alice Rabbit
```

```
AB_join <- inner_join(A,B, by = c("Name"= "First.Name"))
AB_join
```

```
## # A tibble: 3 x 3
##   Name    Car             Pet
##   <chr>   <chr>           <chr>
## 1 Alice   Ford F150       Rabbit
## 2 Bob     Tesla Model III Cat
## 3 Charlie VW Bug          Dog
```

##Q4b Adding Alice pet Guinea Pig

```
Alice_pet <- tribble(
  ~First.Name, ~Pet,
  'Alice', 'Guinea Pig'
)
Alice_pet
```

```
## # A tibble: 1 x 2
##   First.Name Pet
##   <chr>      <chr>
## 1 Alice      Guinea Pig
```

```
B <- bind_rows(B,Alice_pet)
B
```

```
## # A tibble: 4 x 2
##   First.Name Pet
##   <chr>      <chr>
## 1 Bob        Cat
## 2 Charlie    Dog
## 3 Alice      Rabbit
## 4 Alice      Guinea Pig
```

## Q4c Rejoining then with cbind

```
#AB_cbind <- cbind(A,B)

#AB_cbind
```

Error in data.frame due to differing number of rows: A =3rows, B =4rows, resulting in dimension error

##Q 4ci Using join

```
AB_join <- inner_join(A,B, by = c("Name" = "First.Name"))
AB_join
```

```
## # A tibble: 4 x 3
##   Name    Car             Pet
##   <chr>   <chr>           <chr>
## 1 Alice   Ford F150       Rabbit
## 2 Alice   Ford F150       Guinea Pig
## 3 Bob     Tesla Model III Cat
## 4 Charlie VW Bug          Dog
```

## Q5 Questions

```
Customers <- tribble(
      ~PersonID, ~Name, ~Street, ~City, ~State,
      1, 'Derek Sonderegger',  '231 River Run', 'Flagstaff', 'AZ',
      2, 'Aubrey Sonderegger', '231 River Run', 'Flagstaff', 'AZ',
      3, 'Robert Buscaglia', '754 Forest Heights', 'Flagstaff', 'AZ',
      4, 'Roy St Laurent', '845 Elk View', 'Flagstaff', 'AZ')

    Retailers <- tribble(
      ~RetailID, ~Name, ~Street, ~City, ~State,
      1, 'Kickstand Kafe', '719 N Humphreys St', 'Flagstaff', 'AZ',
      2, 'MartAnnes', '112 E Route 66', 'Flagstaff', 'AZ',
      3, 'REI', '323 S Windsor Ln', 'Flagstaff', 'AZ' )

    Cards <- tribble(
      ~CardID, ~PersonID, ~Issue_DateTime, ~Exp_DateTime,
      '9876768717278723',  1,  '2019-9-20 0:00:00', '2022-9-20 0:00:00',
      '5628927579821287',  2,  '2019-9-20 0:00:00', '2022-9-20 0:00:00',
      '7295825498122734',  3,  '2019-9-28 0:00:00', '2022-9-28 0:00:00',
      '8723768965231926',  4,  '2019-9-30 0:00:00', '2022-9-30 0:00:00' )

    Transactions <- tribble(
      ~CardID, ~RetailID, ~DateTime, ~Amount,
      '9876768717278723', 1, '2019-10-1 8:31:23',    5.68,
      '7295825498122734', 2, '2019-10-1 12:45:45',  25.67,
      '9876768717278723', 1, '2019-10-2 8:26:31',    5.68,
      '9876768717278723', 1, '2019-10-2 8:30:09',    9.23,
      '5628927579821287', 3, '2019-10-5 18:58:57',  68.54,
      '7295825498122734', 2, '2019-10-5 12:39:26',  31.84,
      '8723768965231926', 2, '2019-10-10 19:02:20', 42.83)

    Cards <- Cards %>%
      mutate( Issue_DateTime = lubridate::ymd_hms(Issue_DateTime),
              Exp_DateTime   = lubridate::ymd_hms(Exp_DateTime) )
    Transactions <- Transactions %>%
      mutate( DateTime = lubridate::ymd_hms(DateTime))
```

### Q5a

```
customer_name <- 'Derek Sonderegger'

Derek_Statement <- Customers %>%
  filter(Name == customer_name) %>%
  select(PersonID) %>%
  left_join(Cards, by = "PersonID") %>%
  select(CardID) %>%
  left_join(Transactions, by = "CardID") %>%
  left_join(Retailers, by = "RetailID") %>%
  select(CardID,RetailID,DateTime, Amount, Name)

Derek_Statement
```

```
## # A tibble: 3 x 5
##   CardID           RetailID DateTime            Amount Name
##   <chr>               <dbl> <dttm>               <dbl> <chr>
## 1 9876768717278723        1 2019-10-01 08:31:23   5.68 Kickstand Kafe
## 2 9876768717278723        1 2019-10-02 08:26:31   5.68 Kickstand Kafe
## 3 9876768717278723        1 2019-10-02 08:30:09   9.23 Kickstand Kafe
```

##Q5b Aubre

```
#Aubrey's information
aubrey_info <- Customers %>%
  filter(Name == 'Aubrey Sonderegger')

#Aubrey's CardID and PersonID
cardID <- Cards %>%
  filter(PersonID == aubrey_info$PersonID) %>%
  pull(CardID)

personID <- aubrey_info$PersonID


#Close the existing card
Cards %>%
  filter(CardID == cardID) %>%
  mutate(Exp_DateTime = ymd_hms('2019-10-15 16:28:21'))
```

```
## # A tibble: 1 x 4
##   CardID           PersonID Issue_DateTime      Exp_DateTime
##   <chr>               <dbl> <dttm>              <dttm>
## 1 5628927579821287        2 2019-09-20 00:00:00 2019-10-15 16:28:21
```

```
#new CardID
new_cardID <- '1234567890123456'

#new row for Aubrey's new card
new_card <- tibble(
```

```
  CardID = new_cardID,
  PersonID = personID,
  Issue_DateTime = ymd_hms('2019-10-15 16:28:21'),
  Exp_DateTime = ymd_hms('2022-10-15 16:28:21')
)

Cards <- rbind(Cards, new_card)
Cards
```

```
## # A tibble: 5 x 4
##   CardID           PersonID Issue_DateTime      Exp_DateTime
##   <chr>               <dbl> <dttm>              <dttm>
## 1 9876768717278723        1 2019-09-20 00:00:00 2022-09-20 00:00:00
## 2 5628927579821287        2 2019-09-20 00:00:00 2022-09-20 00:00:00
## 3 7295825498122734        3 2019-09-28 00:00:00 2022-09-28 00:00:00
## 4 8723768965231926        4 2019-09-30 00:00:00 2022-09-30 00:00:00
## 5 1234567890123456        2 2019-10-15 16:28:21 2022-10-15 16:28:21
```

### Q5c

```
# Temporary variables for the new transaction
card <- new_cardID
retailid <- 2
datetime <- ymd_hms('2019-10-16 14:30:21')
amount <- 4.98

#  the new transaction
Valid_Cards <- Cards %>%
  filter(CardID == card, Issue_DateTime <= datetime, datetime <= Exp_DateTime)
Valid_Cards
```

```
## # A tibble: 1 x 4
##   CardID           PersonID Issue_DateTime      Exp_DateTime
##   <chr>               <dbl> <dttm>              <dttm>
## 1 1234567890123456        2 2019-10-15 16:28:21 2022-10-15 16:28:21
```

```
if (nrow(Valid_Cards) == 1) {
  new_transaction <- tibble(
    CardID = card,
    RetailID = retailid,
    DateTime = datetime,
    Amount = amount
  )

  Transactions <- rbind(Transactions, new_transaction)
  Transactions
} else {
  print('Card Denied')
}
```

```
## # A tibble: 8 x 4
```

```
##   CardID           RetailID DateTime            Amount
##   <chr>               <dbl> <dttm>               <dbl>
## 1 9876768717278723        1 2019-10-01 08:31:23   5.68
## 2 7295825498122734        2 2019-10-01 12:45:45  25.7
## 3 9876768717278723        1 2019-10-02 08:26:31   5.68
## 4 9876768717278723        1 2019-10-02 08:30:09   9.23
## 5 5628927579821287        3 2019-10-05 18:58:57  68.5
## 6 7295825498122734        2 2019-10-05 12:39:26  31.8
## 7 8723768965231926        2 2019-10-10 19:02:20  42.8
## 8 1234567890123456        2 2019-10-16 14:30:21   4.98
```

### Q5d

```
card <- '9876768717278723'
retailid <- 2
datetime <- ymd_hms('2019-10-17 00:00:00')
amount <- 4.98  # Example nefarious amount

Valid_Cards <- Cards %>%
  filter(CardID == card, Issue_DateTime <= datetime, datetime <= Exp_DateTime)

if (nrow(Valid_Cards) == 2) {
  new_transaction <- tribble(
    ~CardID, ~RetailID, ~DateTime, ~Amount,
    card, retailid, datetime, amount
  )
  Transactions <- bind_rows(Transactions, new_transaction)
  Transactions
} else {
  print('Card Denied')
}
```

```
## [1] "Card Denied"
```

##Q5e

```
customer_name <- 'Aubrey Sonderegger'

Aubrey_Statement <- Customers %>%
  filter(Name == customer_name) %>%
  select(PersonID) %>%
  left_join(Cards, by = "PersonID") %>%
  select(CardID) %>%
  left_join(Transactions, by = "CardID") %>%
  left_join(Retailers, by = "RetailID")  %>%
  select(CardID,RetailID,DateTime, Amount, Name)

Aubrey_Statement
```

```
## # A tibble: 2 x 5
##   CardID           RetailID DateTime            Amount Name
```

```
##   <chr>               <dbl> <dttm>               <dbl> <chr>
## 1 5628927579821287        3 2019-10-05 18:58:57  68.5  REI
## 2 1234567890123456        2 2019-10-16 14:30:21   4.98 MartAnnes
```