

# Assignment 6

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## Exercise 1

a)

```
Survey <- read.csv('https://www.lock5stat.com/datasets2e/StudentSurvey.csv', na.strings=c(' ', ' '))
```

b)

```
Survey1 <- Survey %>%  
  select(Year, Gender) %>%  
  mutate(  
    Year = factor(Year, labels = c('FirstYear', 'Sophomore', 'Junior', 'Senior')),  
    Gender = factor(ifelse(Gender == 'M', 'Male', 'Female'))  
  )  
Survey1
```

```
##      Year Gender  
## 1   Junior  Male  
## 2   Senior Female  
## 3 FirstYear  Male  
## 4   Sophomore  Male  
## 5   Senior Female  
## 6   Senior Female  
## 7 FirstYear Female  
## 8   Senior  Male  
## 9   Sophomore Female  
## 10 FirstYear Female  
## 11   Senior Female  
## 12 FirstYear  Male  
## 13   Senior  Male  
## 14   Sophomore Female  
## 15 FirstYear  Male  
## 16 FirstYear Female  
## 17 FirstYear Female  
## 18   Senior  Male  
## 19   Senior Female  
## 20   Senior Female  
## 21   Senior Female  
## 22   Senior Female  
## 23 FirstYear  Male  
## 24   Senior  Male  
## 25   Senior  Male  
## 26   Senior  Male
```

## 27	Senior	Female
## 28	Sophomore	Male
## 29	FirstYear	Male
## 30	Junior	Male
## 31	Sophomore	Male
## 32	Senior	Female
## 33	FirstYear	Male
## 34	Junior	Male
## 35	FirstYear	Female
## 36	Senior	Female
## 37	FirstYear	Male
## 38	Senior	Female
## 39	Senior	Female
## 40	Sophomore	Female
## 41	Junior	Male
## 42	Senior	Female
## 43	Senior	Female
## 44	FirstYear	Female
## 45	FirstYear	Male
## 46	Sophomore	Male
## 47	Junior	Male
## 48	Senior	Male
## 49	Junior	Male
## 50	Senior	Female
## 51	FirstYear	Male
## 52	Junior	Female
## 53	Sophomore	Male
## 54	Junior	Male
## 55	Sophomore	Male
## 56	FirstYear	Male
## 57	Sophomore	Female
## 58	Senior	Female
## 59	Senior	Female
## 60	FirstYear	Female
## 61	Senior	Male
## 62	Junior	Male
## 63	FirstYear	Female
## 64	FirstYear	Male
## 65	FirstYear	Male
## 66	Senior	Female
## 67	FirstYear	Male
## 68	Senior	Male
## 69	Senior	Male
## 70	Junior	Male
## 71	Junior	Female
## 72	Senior	Female
## 73	FirstYear	Female
## 74	FirstYear	Female
## 75	Senior	Female
## 76	FirstYear	Female
## 77	FirstYear	Female
## 78	Senior	Female
## 79	Senior	Female
## 80	Senior	Male

```

## 81      Senior  Male
## 82 FirstYear Female
## 83 FirstYear Female
## 84   Sophmore Female
## 85 FirstYear Female
## 86      Senior Female
## 87      Junior   Male
## 88 FirstYear Female
## 89 FirstYear   Male
## 90 FirstYear   Male
## 91      Senior   Male
## 92 FirstYear Female
## 93      Senior Female
## 94      Senior   Male
## 95 FirstYear   Male
## 96      Senior   Male
## 97      Senior Female
## 98      Senior   Male
## 99      Senior   Male
## 100 FirstYear   Male
## 101      Junior Female
## 102      Senior Female
## 103 FirstYear   Male
## 104      Senior   Male
## 105      Senior   Male
## 106      <NA> Female
## 107      Senior   Male
## 108      Senior   Male
## 109      Senior Female
## 110      Senior   Male
## 111      Senior   Male
## 112      Senior   Male
## 113      Senior Female
## 114 FirstYear   Male
## 115 FirstYear Female
## 116      Senior Female
## 117      Senior Female
## 118      Senior   Male
## 119      Senior   Male
## 120 FirstYear Female
## 121      Senior Female
## 122 FirstYear   Male
## 123      Senior   Male
## 124      Senior   Male
## 125      Senior Female
## 126      Senior   Male
## 127      Senior   Male
## 128 FirstYear   Male
## 129      Senior Female
## 130      Senior   Male
## 131      Junior Female
## 132 FirstYear Female
## 133      Senior Female
## 134      Senior Female

```

```

## 135    Senior Female
## 136    Senior Female
## 137    Senior   Male
## 138 FirstYear Female
## 139    Senior Female
## 140 Sophomore Female
## 141 FirstYear   Male
## 142 FirstYear Female
## 143 FirstYear   Male
## 144 Sophomore   Male
## 145 FirstYear Female
## 146    Senior Female
## 147 FirstYear Female
## 148    Senior   Male
## 149    Senior   Male
## 150 FirstYear Female
## 151    Senior Female
## 152 FirstYear   Male
## 153 FirstYear Female
## 154    Senior   Male
## 155    Junior   Male
## 156    Senior Female
## 157 FirstYear Female
## 158    Senior Female
## 159    Junior Female
## 160    Senior Female
## 161 FirstYear   Male
## 162 FirstYear Female
## 163    Senior   Male
## 164    Junior   Male
## 165    Senior   Male
## 166    Senior Female
## 167 Sophomore   Male
## 168 FirstYear   Male
## 169    Senior   Male
## 170    Senior   Male
## 171    Senior Female
## 172    Senior Female
## 173 Sophomore Female
## 174    Senior Female
## 175    Junior Female
## 176 FirstYear   Male
## 177    Senior   Male
## 178    Senior Female
## 179 FirstYear   Male
## 180    Senior Female
## 181    Senior   Male
## 182    Senior Female
## 183    Senior Female
## 184    Senior Female
## 185 FirstYear Female
## 186    Senior   Male
## 187    Senior   Male
## 188    Senior Female

```

##	189	Senior	Male
##	190	Senior	Male
##	191	Sophomore	Male
##	192	Sophomore	Female
##	193	Senior	Male
##	194	Senior	Female
##	195	Senior	Male
##	196	Senior	Male
##	197	Senior	Female
##	198	Senior	Male
##	199	FirstYear	Male
##	200	FirstYear	Female
##	201	Senior	Female
##	202	FirstYear	Male
##	203	Sophomore	Female
##	204	Senior	Female
##	205	Senior	Female
##	206	FirstYear	Female
##	207	Senior	Male
##	208	FirstYear	Male
##	209	Senior	Male
##	210	FirstYear	Male
##	211	Senior	Female
##	212	Junior	Male
##	213	Junior	Female
##	214	Senior	Female
##	215	Senior	Male
##	216	FirstYear	Female
##	217	Senior	Female
##	218	Senior	Female
##	219	Senior	Male
##	220	Sophomore	Male
##	221	Senior	Male
##	222	Senior	Male
##	223	Senior	Male
##	224	Senior	Male
##	225	Junior	Male
##	226	Senior	Female
##	227	Senior	Female
##	228	Senior	Male
##	229	Senior	Female
##	230	FirstYear	Female
##	231	Senior	Female
##	232	Senior	Male
##	233	Senior	Male
##	234	Senior	Male
##	235	Sophomore	Female
##	236	Senior	Female
##	237	Senior	Male
##	238	FirstYear	Male
##	239	Senior	Male
##	240	Senior	Male
##	241	Senior	Female
##	242	Senior	Male

```

## 243 FirstYear  Male
## 244   Senior Female
## 245   Junior  Male
## 246   Senior Female
## 247 FirstYear  Male
## 248   Senior  Male
## 249   Senior  Male
## 250   Senior  Male
## 251 Sophomore  Male
## 252 FirstYear  Male
## 253   Senior  Male
## 254   Junior  Male
## 255   Senior  Male
## 256   Senior Female
## 257 Sophomore Female
## 258   Senior  Male
## 259   Senior  Male
## 260   Senior  Male
## 261   Senior  Male
## 262 FirstYear  Male
## 263      <NA> Female
## 264 Sophomore  Male
## 265 FirstYear Female
## 266 Sophomore Female
## 267   Senior  Male
## 268 Sophomore  Male
## 269   Senior  Male
## 270   Senior Female
## 271 FirstYear  Male
## 272 FirstYear Female
## 273   Senior Female
## 274   Senior Female
## 275 FirstYear Female
## 276   Senior Female
## 277   Junior  Male
## 278   Junior  Male
## 279 FirstYear Female
## 280 FirstYear  Male
## 281   Senior  Male
## 282 FirstYear Female
## 283   Junior  Male
## 284   Senior Female
## 285   Senior Female
## 286   Senior Female
## 287   Junior  Male
## 288   Senior Female
## 289 FirstYear  Male
## 290 FirstYear  Male
## 291   Senior Female
## 292   Senior  Male
## 293 Sophomore Female
## 294 FirstYear Female
## 295   Senior  Male
## 296   Senior Female

```

##	297	Junior	Male
##	298	Senior	Female
##	299	FirstYear	Male
##	300	Senior	Male
##	301	FirstYear	Female
##	302	Senior	Male
##	303	Senior	Male
##	304	Senior	Male
##	305	Senior	Female
##	306	Senior	Male
##	307	Sophmore	Male
##	308	Sophmore	Female
##	309	Senior	Male
##	310	Senior	Female
##	311	Junior	Male
##	312	Senior	Male
##	313	FirstYear	Female
##	314	Sophmore	Female
##	315	Senior	Female
##	316	FirstYear	Female
##	317	Junior	Male
##	318	Senior	Female
##	319	Senior	Male
##	320	Junior	Female
##	321	Sophmore	Male
##	322	Junior	Male
##	323	FirstYear	Male
##	324	Junior	Female
##	325	Sophmore	Female
##	326	FirstYear	Male
##	327	Senior	Female
##	328	Senior	Male
##	329	FirstYear	Male
##	330	Senior	Male
##	331	Sophmore	Male
##	332	FirstYear	Male
##	333	Sophmore	Female
##	334	FirstYear	Male
##	335	Sophmore	Male
##	336	Senior	Male
##	337	Senior	Female
##	338	Senior	Male
##	339	Senior	Male
##	340	Senior	Male
##	341	Senior	Female
##	342	Senior	Male
##	343	Junior	Male
##	344	Senior	Male
##	345	FirstYear	Male
##	346	Senior	Female
##	347	Senior	Male
##	348	FirstYear	Male
##	349	FirstYear	Female
##	350	Junior	Male

```
## 351      Senior Female
## 352 FirstYear  Male
## 353      Senior Female
## 354      Senior  Male
## 355      Junior Female
## 356 Sophomore Female
## 357      Senior  Male
## 358      Senior Female
## 359      Senior  Male
## 360      Senior Female
## 361 FirstYear  Male
## 362      Senior Female
```

c)

```
Survey2 <- Survey1 %>%
  group_by(Year, Gender) %>%
  count() %>%
  drop_na()
Survey2
```

```
## # A tibble: 8 x 3
## # Groups:   Year, Gender [8]
##   Year      Gender      n
##   <fct>    <fct> <int>
## 1 FirstYear Female    43
## 2 FirstYear Male     51
## 3 Sophomore Female    18
## 4 Sophomore Male     17
## 5 Junior    Female    10
## 6 Junior    Male     26
## 7 Senior    Female    96
## 8 Senior    Male     99
```

d)

```
Survey2 %>%
  pivot_wider(names_from = Year, values_from = n)
```

```
## # A tibble: 2 x 5
## # Groups:   Gender [2]
##   Gender FirstYear Sophomore Junior Senior
##   <fct>    <int>    <int> <int> <int>
## 1 Female      43      18     10    96
## 2 Male       51      17     26    99
```

## Exercise 2

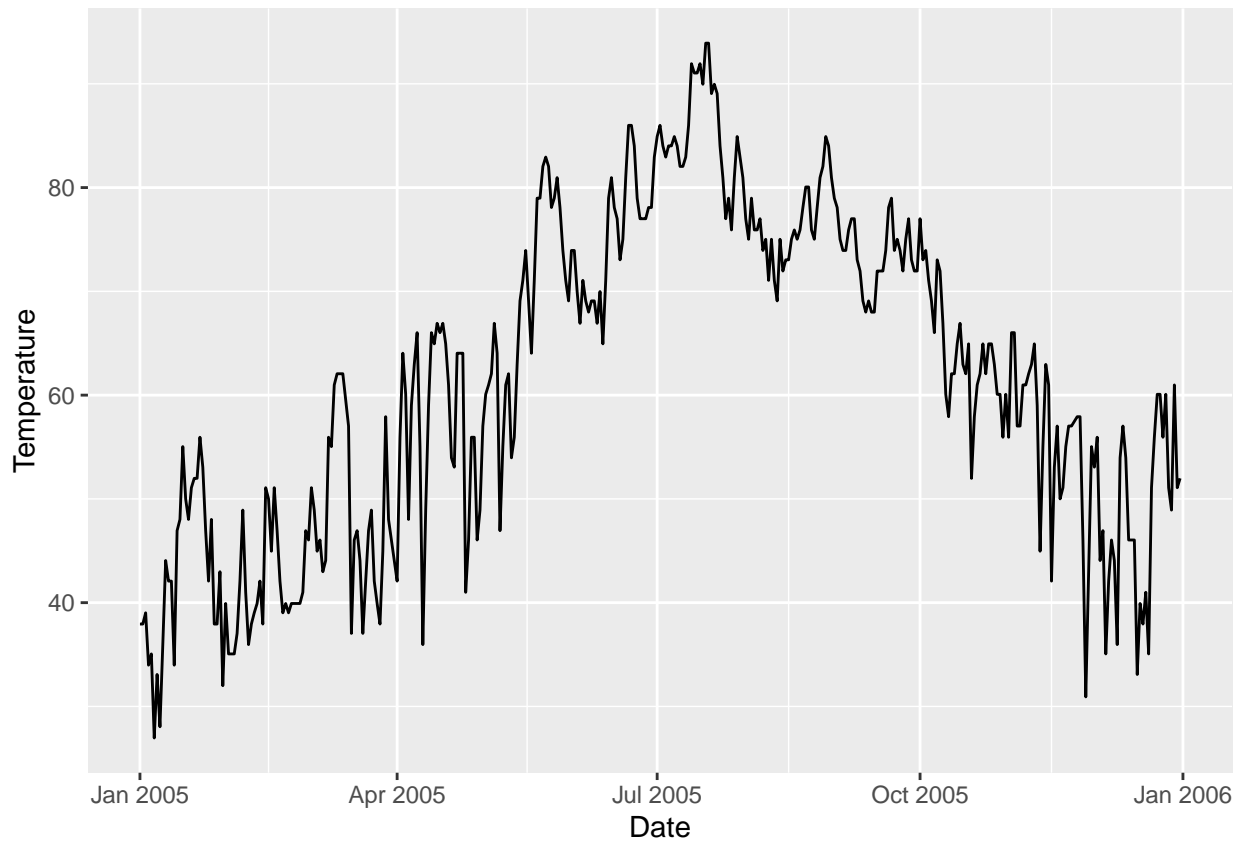
a)

```
temperatureData <- read.csv('https://raw.githubusercontent.com/BuscagliaR/STA_444_v2/master/data-raw/FL')
```

```
temperatureData %>%
  filter(Year == 2005) %>%
  pivot_longer(X1:X31, names_to = 'Day', values_to = 'Temperature') %>%
  drop_na() %>%
  mutate(Day = str_extract(Day, "\\d+"),
```



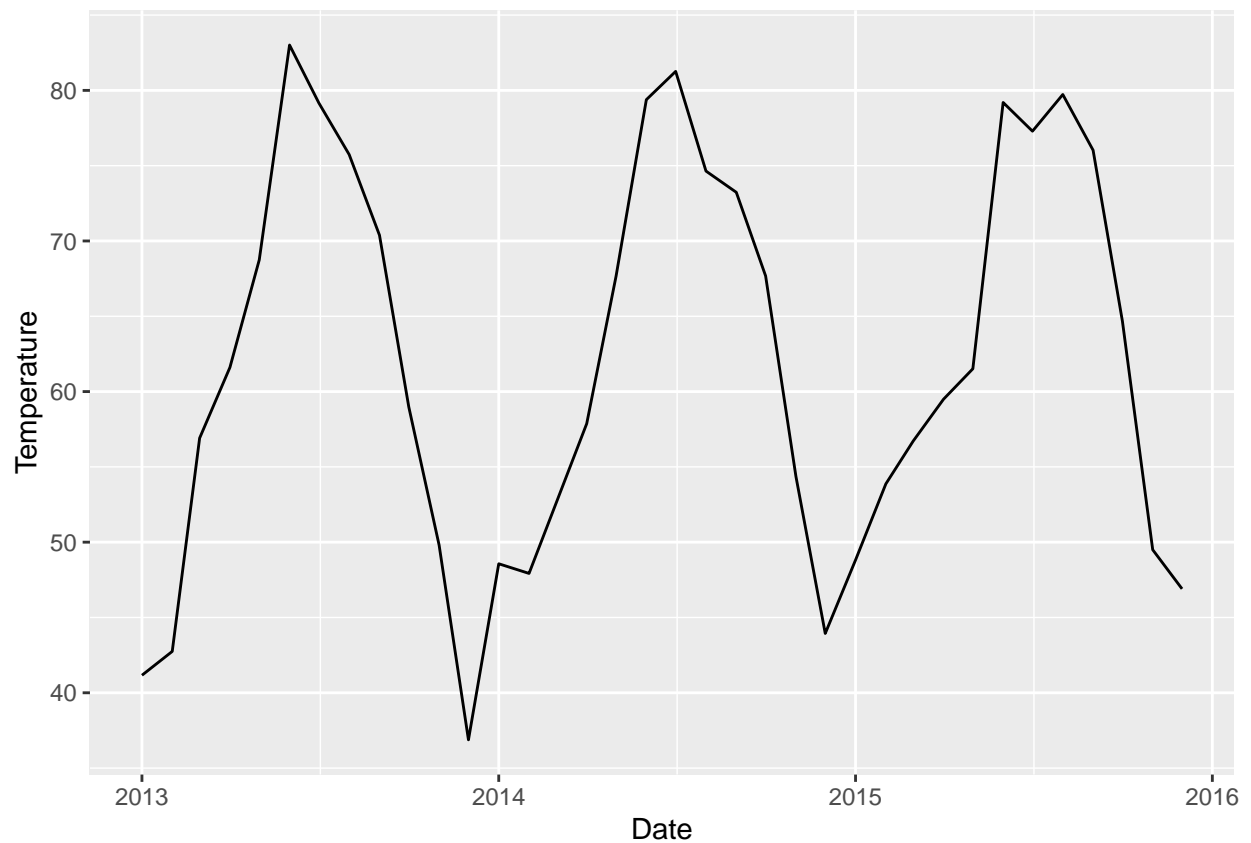
```
Date = ymd(str_c(Year,Month,Day, sep = "-")) %>%
ggplot(aes(x = Date, y = Temperature)) +
geom_line()
```



b)

```
temperatureData %>%
  filter(Year > 2012 & Year < 2016) %>%
  pivot_longer(X1:X31,names_to = 'Day', values_to = 'Temperature') %>%
  drop_na() %>%
  mutate(Day = str_extract(Day,"\\d+")) %>%
  group_by(Year,Month) %>%
  summarise(Temperature = mean(Temperature)) %>%
  mutate(Date = ym(str_c(Year,Month,sep = "-"))) %>%
  ggplot(aes(x = Date, y = Temperature)) +
  geom_line()
```

```
## `summarise()` has grouped output by 'Year'. You can override using the
## `.groups` argument.
```



### Exercise 3

```
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')
```

a)

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

```
## # 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
```

b)

```
B <- add_row(B, First.Name = 'Alice', Pet = 'Guinea Pig')
```

c)

```
full_join(A, B, by = c("Name" = "First.Name"))
```

```
## # 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
```

## Exercise 4

```
data('flights', package = 'nycflights13')
data('airlines', package = 'nycflights13')
data('airports', package = 'nycflights13')
flights <- flights %>%
  filter(month == 2 & day == 14 & carrier == 'VX')
left_join(flights, airports, by = c("dest" = "faa"))
```

```
## # A tibble: 10 x 26
##   year month   day dep_time sched_dep_time dep_delay arr_time sched_arr_time
##   <int> <int> <int>   <int>         <int>         <dbl>   <int>         <int>
## 1  2013     2    14     706             705           1    1037           1035
## 2  2013     2    14     732             730           2    1056           1115
## 3  2013     2    14     909             905           4    1219           1235
## 4  2013     2    14     934             935          -1    1201           1235
## 5  2013     2    14    1029            1030          -1    1337           1415
## 6  2013     2    14    1317            1320          -3    1627           1650
## 7  2013     2    14    1706            1655          11    2014           2030
## 8  2013     2    14    1746            1630          76    2107           2015
## 9  2013     2    14    1852            1855          -3    2215           2240
## 10 2013     2    14    2017            2005         12    2340           2335
## # i 18 more variables: arr_delay <dbl>, carrier <chr>, flight <int>,
## #   tailnum <chr>, origin <chr>, dest <chr>, air_time <dbl>, distance <dbl>,
## #   hour <dbl>, minute <dbl>, time_hour <dtm>, name <chr>, lat <dbl>,
## #   lon <dbl>, alt <dbl>, tz <dbl>, dst <chr>, tzone <chr>
```