STAT 201: Practice Midterm

Solutions

Question 1

```
gun_violence |>
  count(city_or_county) |>
  arrange(-n) |>
  mutate(prop = n / sum(n)) |>
  slice(1:5) |>
  kable()
```

city_or_county	n	prop
Chicago	10298	0.0462661
Baltimore	3703	0.0166366
New Orleans	2939	0.0132041
Philadelphia	2824	0.0126875
Jacksonville	2372	0.0106567

Question 2

```
gun_violence |>
  mutate(n_shot = n_killed + n_injured) |>
  arrange(-n_shot) |>
  slice(1:6) |>
  select(date, state, city_or_county, n_shot) |>
  kable()
```

date	state	city_or_county	n_shot
2016-06-12	Florida	Orlando	103
2017-11-05	Texas	Sutherland Springs	47

date	state	city_or_county	n_shot
2015-12-02	California	San Bernardino	35
2015-05-17	Texas	Waco	27
2017-07-01	Arkansas	Little Rock	25
2016-07-25	Florida	Fort Myers	21

Question 3

```
state_incidents <- gun_violence |>
  count(state, year)

state_incidents |>
  group_by(state) |>
  summarise(avg_n = mean(n)) |>
  arrange(-avg_n) |>
  slice(c(1:3, 48:50)) |>
  kable()
```

state	avg_n
Illinois	4173.75
California	3792.75
Florida	3549.25
Wyoming	120.00
Vermont	113.00
Hawaii	67.50

Question 4

```
state_incidents2 <- state_incidents |>
  left_join(census, by = c("state", "year")) |>
  left_join(laws, by = "state")
```

Question 5

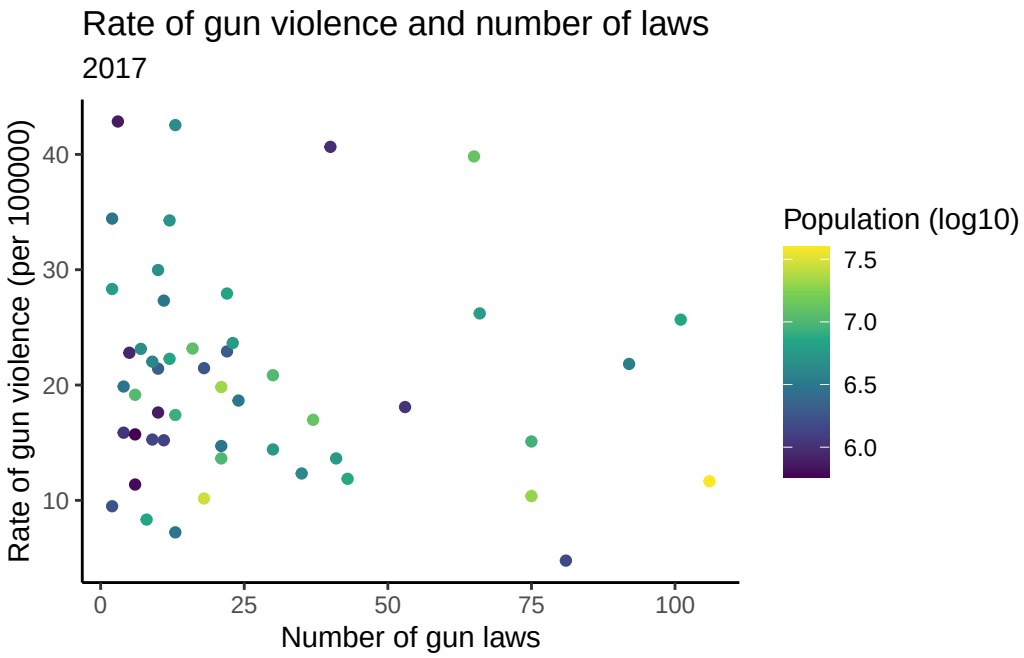
```
state_incidents2 <- state_incidents2 |>
  mutate(rate = n/population * 100000)

state_incidents2 |>
  group_by(state) |>
  summarise(avg_rate = mean(rate)) |>
  arrange(-avg_rate) |>
  slice(c(1:3, 48:50)) |>
  kable()
```

state	avg_rate
Alaska	43.556789
Delaware	41.743675
Louisiana	41.026640
Utah	8.424150
Arizona	7.900990
Hawaii	4.743822

Question 6

```
state_incidents2 |>
  filter(year == 2017) |>
  mutate(log_population = log10(population)) |>
  ggplot(aes(x = gun_laws2017, y = rate, col = log_population)) +
  geom_point() +
  theme_classic() +
  scale_color_viridis_c() +
  labs(x = "Number of gun laws", y = "Rate of gun violence (per 100000)",
       title = "Rate of gun violence and number of laws",
       subtitle = "2017",
       color = "Population (log10)")
```


Rate of gun violence and number of laws
2017
Rate of gun violence (per 100000)
40
30
20
10
0
25
50
75
100
Number of gun laws
Population (log10)
7.5
7.0
6.5
6.0