Part 1

Rebecca Venetianer

10/25/2017

Read and clean data, recode sex to "male" and "female":

```
pups_data = read_csv("./FAS_pups.csv", col_types = "ciiiii") %>%
  clean_names() %>%
  mutate(sex = recode(sex, `1` = "male", `2` = "female"))
```

Convert data into long format by adding "pd_outcome" and "days" columns:

```
pups_data <- gather(pups_data, key = pd_outcome, value = days, pd_ears:pd_walk)
```

Rename outcome variable to remove "pd":

```
pups_data$pd_outcome[pups_data$pd_outcome == "pd_ears"] <- "ears"
pups_data$pd_outcome[pups_data$pd_outcome == "pd_eyes"] <- "eyes"
pups_data$pd_outcome[pups_data$pd_outcome == "pd_pivot"] <- "pivot"
pups_data$pd_outcome[pups_data$pd_outcome == "pd_walk"] <- "walk"
```

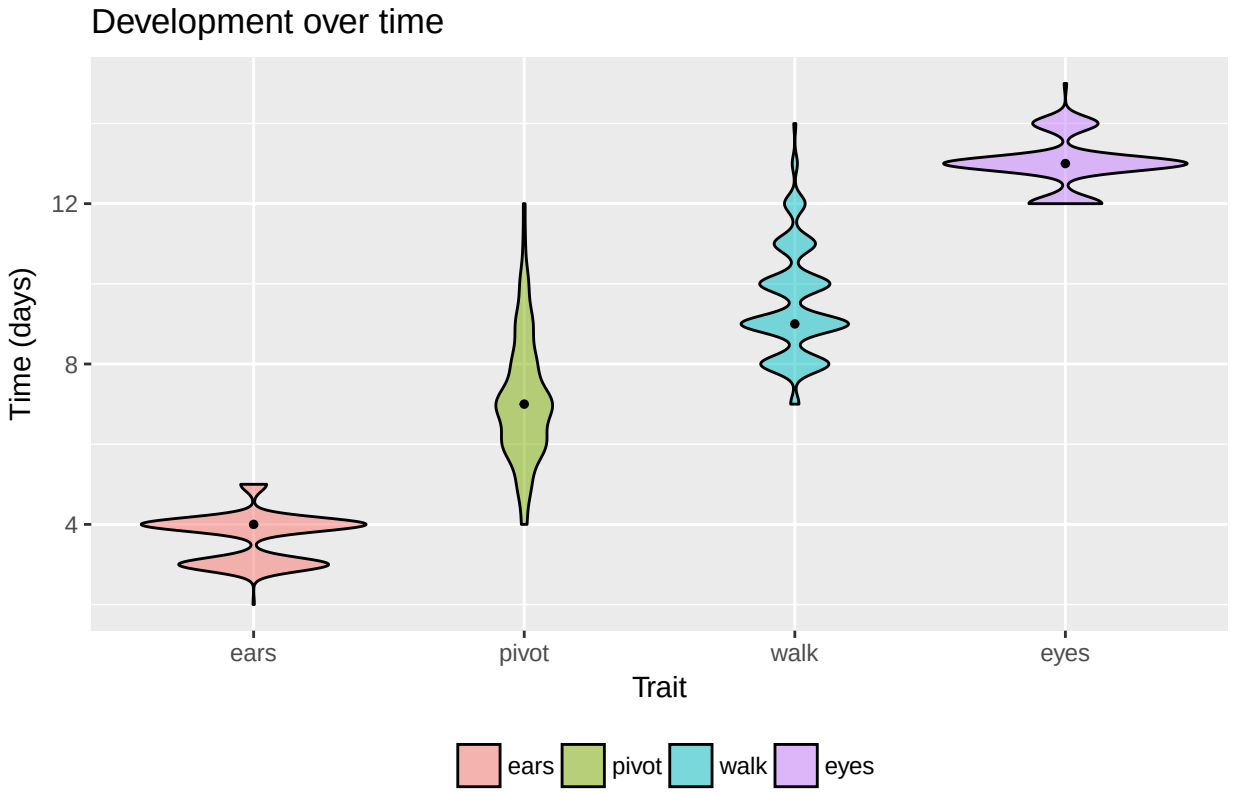
Create a plot showing the distribution of post-natal days for each developmental landmark:

Please note: the 44 rows removed did not have measurements recorded, therefore it is inconsequential to disclude them from the plot.

```
pups_data$pd_outcome <- factor(pups_data$pd_outcome, levels = c("ears", "pivot", "walk",
                                                                "eyes"))
ggplot(pups_data, aes(x = pd_outcome, y = days)) +
  geom_violin(aes(fill = pd_outcome), color = "black", alpha = 0.5) +
  stat_summary(fun.y = median, geom = "point", color = "black", size = 1) +
  labs(
     title = "Development over time",
     x = "Trait",
     y = "Time (days)",
     caption = "Data showing the distribution of growth in the population over time."
   ) +
  theme(legend.position = "bottom") +
  scale_fill_discrete("")
```

```
## Warning: Removed 44 rows containing non-finite values (stat_ydensity).
```

```
## Warning: Removed 44 rows containing non-finite values (stat_summary).
```



Data showing the distribution of growth in the population over time.

The earliest trait to begin development in pups is the ears, which appears to start at postnatal day 2 and end on day 5, with most of the population completing development at day 4. Eye development also show a distribution of 3 days in the population, however they appear much later. The majority develop eyes on day 13 with a range being day 12 to 15. The longest range is seen in walk, with development appearing from day 7 to 14 with the median as day 9. Pivot development is not much shorter with a range of 8 days (day 4 to 12) and a median of day 7. We can surmise that ears and eyes must develop during a shorter window of time, whereas the pivot and walk of pups are not as crucial to complete development as quickly (as their window for development is wider).