DSCI 310: Historical Horse Population in Canada

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CONTENTS

```
import pandas as pd
from myst_nb import glue
```

This project explores the historical population of horses in Canada between 1906 and 1972 for each province.

Data

Horse population data were sourced from the Government of Canada's Open Data website. Specifically, (Government of Canada, 2017)1 and (Government of Canada, 2017)2.

Methods

The R programming language (R Core Team, 2019) and the following R packages were used to perform the analysis: knitr (Xie, 2014), tidyverse (Wickham, 2017), and bookdown (Xie, 2016) *Note: this report is adapted from (Timbers, 2020).*

Results

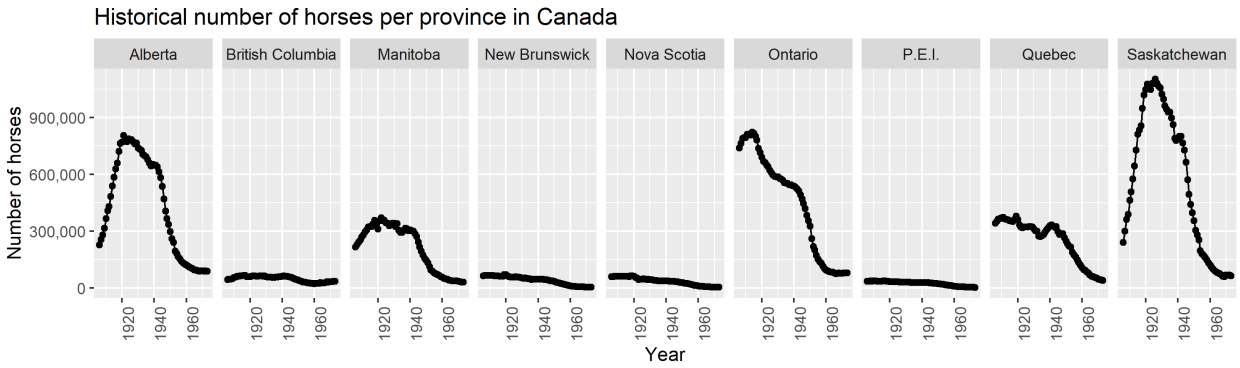

Fig. 1: Horse populations for all provinces in Canada from 1906 - 1972

We can see from Fig. Figure 1 that Ontario, Saskatchewan and Alberta have had the highest horse populations in Canada. All provinces have had a decline in horse populations since 1940. This is likely due to the rebound of the Canadian automotive industry after the Great Depression and the Second World War. An interesting follow-up visualisation would be car sales per year for each Province over the time period visualised above to further support this hypothesis.

```
horses_sd = pd.read_csv("../../results/horses_sd.csv")

largest_sd_prov = str(horses_sd['Province'][0])
glue("largest-sd-prov", largest_sd_prov)

horses_sd_noindex = horses_sd.style.hide_index()
glue("horses-tbl", horses_sd_noindex)
```

```
'Saskatchewan'
```

```
<pandas.io.formats.style.Styler at 0x1f42b0e98b0>
```

Suppose we were interested in looking in more closely at the province with the highest spread (in terms of standard deviation) of horse populations. We present the standard deviations here:

```
<pandas.io.formats.style.Styler at 0x1f42b0e98b0>
```

Fig. 2: Standard deviation of number of horses for each province between 1940 - 1972

Note that we define standard deviation (of a sample) as:

$$s = sqrtsum_{i=1}^{n}(x_i - \bar{x})/n - 1.$$

Additionally, note that in Fig Figure 2. we consider the sample standard deviation of the number of horses during the same time span as Fig. 1.

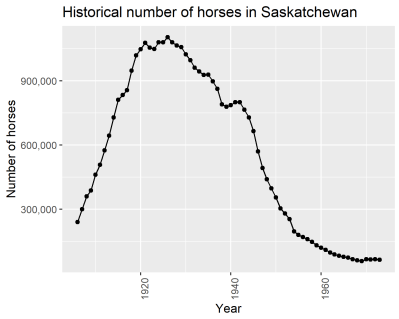

Fig. 3: Horse populations for the province with the largest standard deviation

In `Fig. {number}` we zoom in on the province of , which had the largest spread of values in terms of standard deviation.

References