Team Aerium Analytics

Project goal: develop a machine learning method which creates a mask of the image depicting where the lines occur automatically

Team Mentors:

Heather Hardeman-Vooys, Aerium Analytics
Matthew Greenberg, University of Calgary

Who we are:

Enthusiastic machine learning scientists, mathematicians

Carlos Contreras, Postdoctoral Fellow, University of Alberta
Keran Li, PhD Student, University of Calgary
Li Wang, PhD Student, The University of British Columbia
Junjie Zhu, Recent Masters Graduate from The University of British Columbia
Tingzhou Yu, Masters Student, University of Victoria
Yi Sui, Recent PhD Graduate from Simon Fraser University

Team Webpage:

https://mathtopowerindustry.ca/project/aerium-analytics/

Data: Cross-Canada Survey of Radon Concentrations in Homes

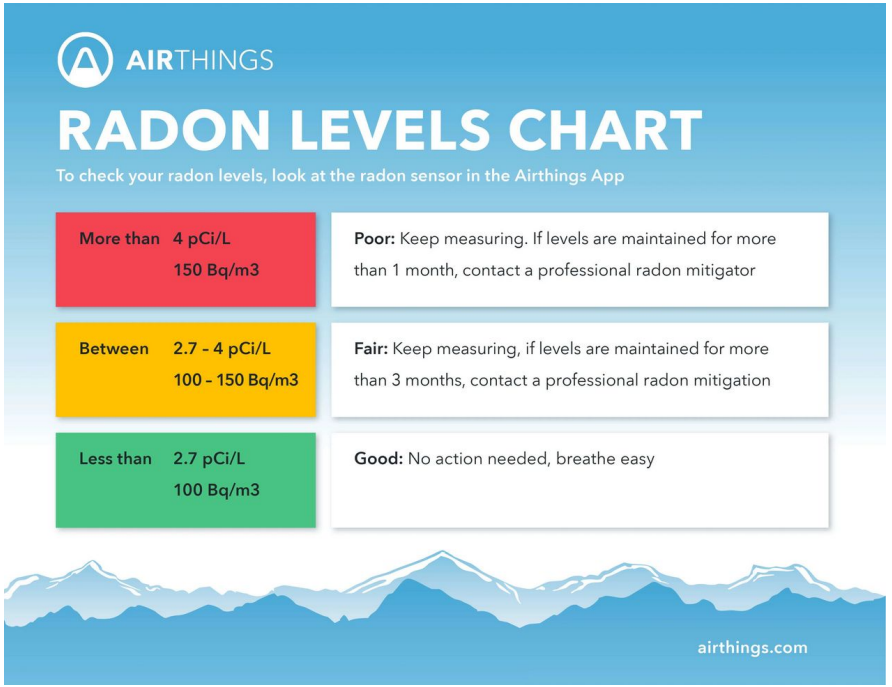
- Survey of long-term measurements of radon concentrations in volunteer homes from 2009 – 2011

- 13814 entries
  - provinces/territories
  - health administrative areas
  - test durations
  - average radon concentration

- Data cleansing and exploration using Python libraries (pandas, matplotlib and geopandas)

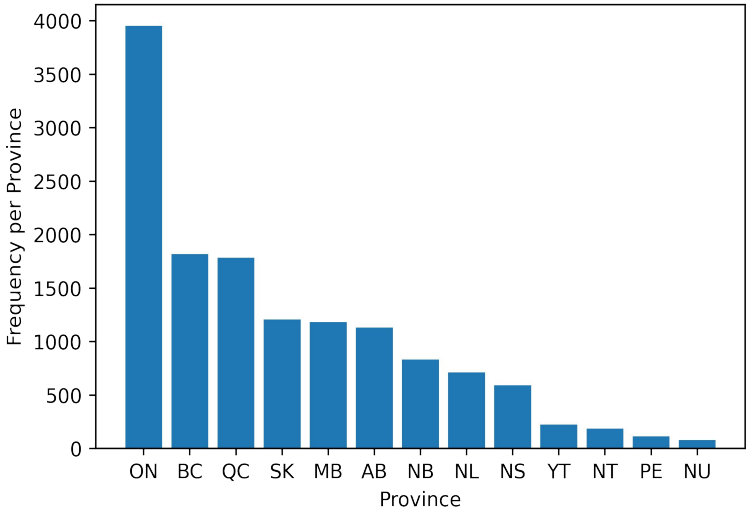
Why is studying Radon is important?

- Radon causes lung cancer
- 21,000 people die yearly in the US of lung cancer
- WHO recommends home levels to be below 100 Bq/m^3
- Above 300 Bq/m^3 is critical

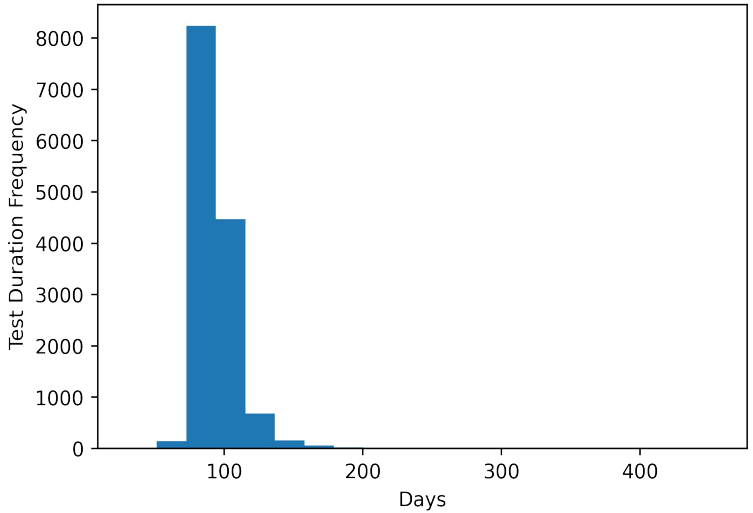


Exploratory Data Analysis:

- Most observations are in Ontario, British Columbia, and Quebec.



- Most observations have test duration around 100 days.



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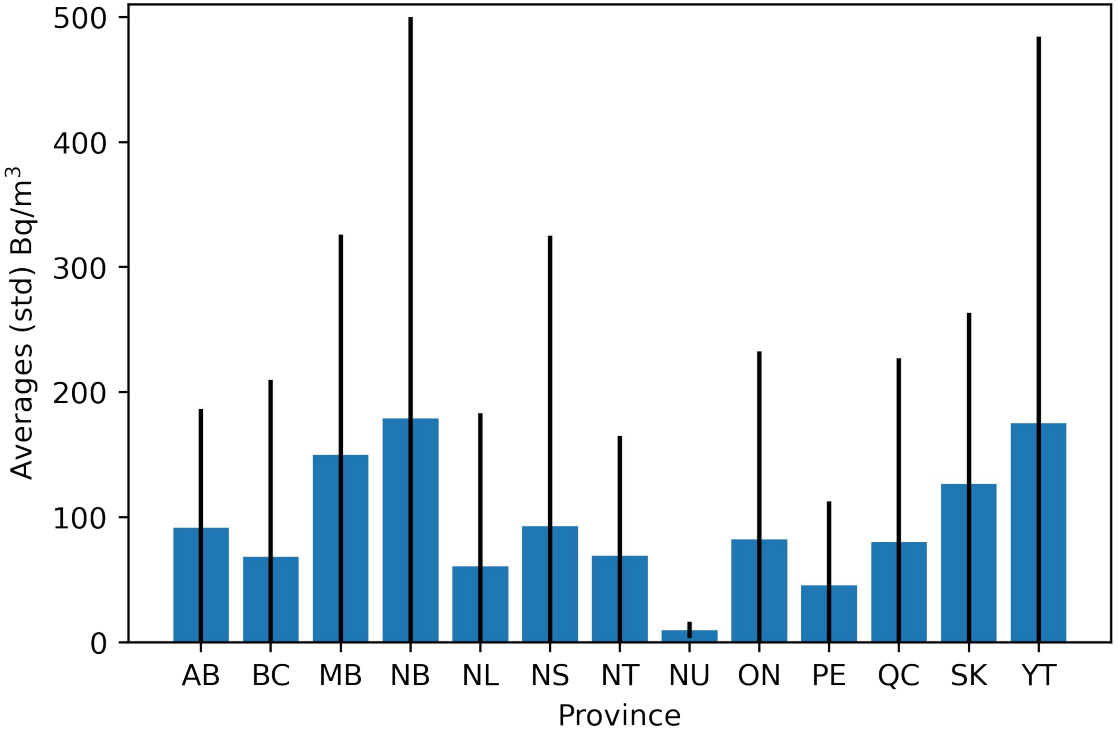

- Manitoba, New Brunswick, Saskatchewan, and Yukon have higher average radon concentration.
- New Brunswick and Yukon have high variance in average radon concentration.

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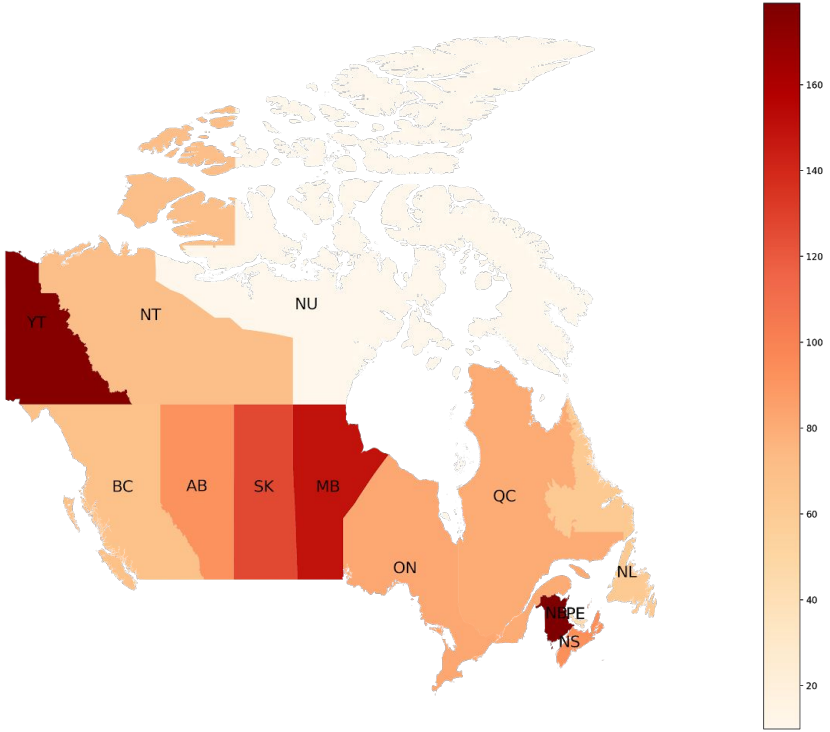

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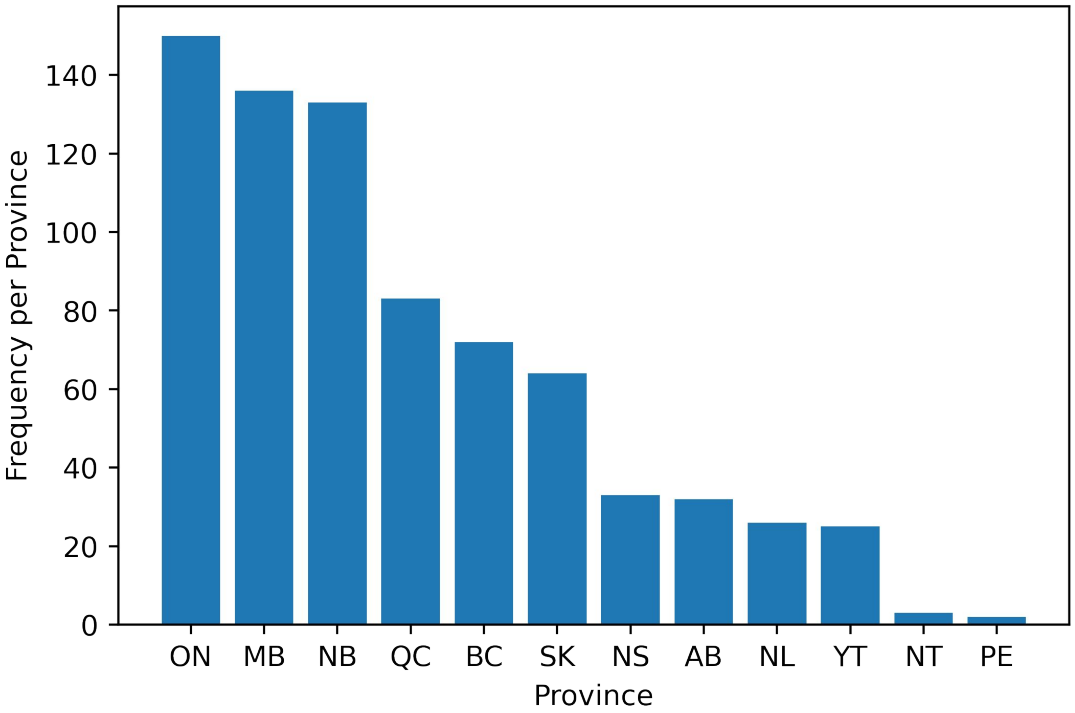
Homes with level of Radon above critical (>300 Bq/m^3)



- Ontario, Manitoba, and Yukon have the higher number of homes with critical levels of Radon.
- Nunavut and PEI have the least number of homes with critical levels of Radon.

	ProvinceTerritory	Health Region2007	ForwardSortationAreaCodes	TestDurationInDays	AverageRadonConcentrationInBqPerM3
0	NL	Eastern Regional Integrated Health Authority	A0A	127.0	20.0
1	NL	Eastern Regional Integrated Health Authority	A0A	108.0	36.0
2	NL	Eastern Regional Integrated Health Authority	A0E	91.0	7.5
3	NL	Eastern Regional Integrated Health Authority	A0A	91.0	31.0
4	NL	Eastern Regional Integrated Health Authority	A0C	98.0	26.0

Canada Radon Concentration