

Job vacancies in Canada

Contributors:

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What does the software do?

The software system takes Statistics Canada database on job vacancies and processes the data into meaningful correlations that can be displayed via graphs.

Data will need to be pre-processed before running through the system this speeds up the run time of the system allowing for real time variation.



DATA SOURCES

Demographic information in Canada is provided through various Federal, Provincial and Territorial systems. Federal data for the entire country is collected by Statistics Canada.

Statistics Canada. (Dec, 2023). Job vacancies, proportion of job vacancies and average offered hourly wage by selected characteristics, quarterly, unadjusted for seasonality.

DOI: <https://doi.org/10.25318/1410032801-eng> **Accessed (Mar, 2023).**

****Statistics Canada notes:** Data for the second and third quarters of 2020 are unavailable due to some Statistics Canada operations being temporarily suspended during the COVID-19 pandemic.**

Who the team is?

Daman Kumar (1306900)

Role: Agile Lead

Previous roles:

Quality Assurance/ Testability Lead

Contributions:

Question 1

Validate errors

Jacob Good (1300566)

Role: Documentation Lead

Previous roles:

Communication Officer

Agile Lead

Contributions:

Question 3

Documentation Backup

Hamza Irshad (1261380)

Role: Project Manager

Previous roles: Process Coordinator/ Agile-Lead

Contributions:

Question 2

Trello board

Ryan Sass-Gregoire (1230473)

Role: Architect/ Conceptual

Interaction Lead

Contributions:

Question 4

Question 1

*What is the **Total** offered hourly **wage** for a particular **season** (quarterly) for Software Engineers and Designers over the **years**?*

Interesting or What?

- Helps organisation to analyse their budget and economic score for different seasons
- Helps to determine the variation in wage offering. Is it different from last quarter (or year)?.



- Moreover, It provides valuable insights for businesses to stay competitive, manage costs, and adapt upsides and downsides of economy.



Building Software:

1) Full understanding of Data source.
<https://doi.org/10.25318/1410032801-eng>

2) Using **pre_process_question1.py**, the huge data file was filtered to required data with required fields.

3) Filtered Data stored in a file called **pre_process_file.csv**

4) using the csv file, Data gets analyzed using **question1.py** python file.

5) Now, the software is able to give out the data that one wants.



VISUALIZATION

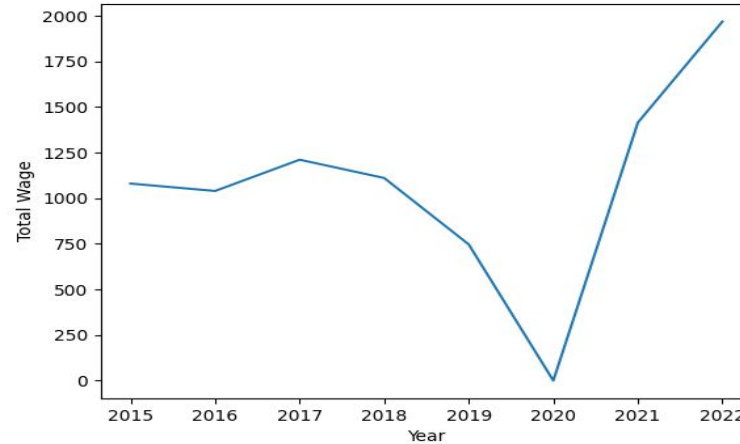
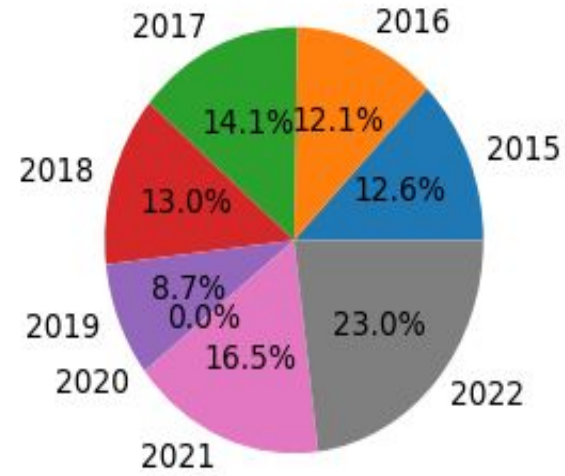
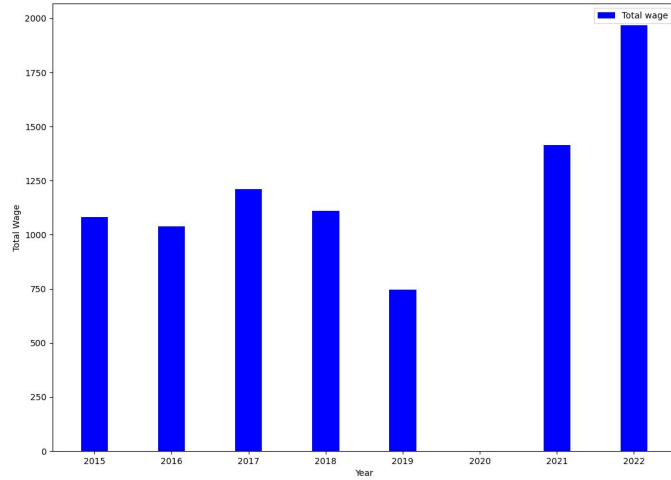
Has been done using panda's library (matplotlib, seaborn and numpy)

question1_plotting.py helps to provide three different types of plot :

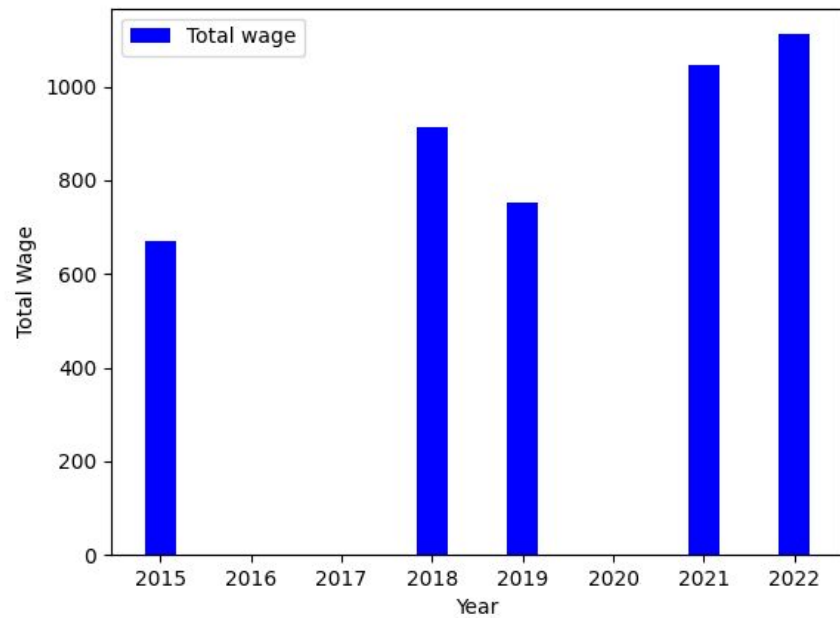
- **Bar** Graph
- **Line** Graph
- **Pie** Chart

“BRITISH COLUMBIA” “SUMMER”

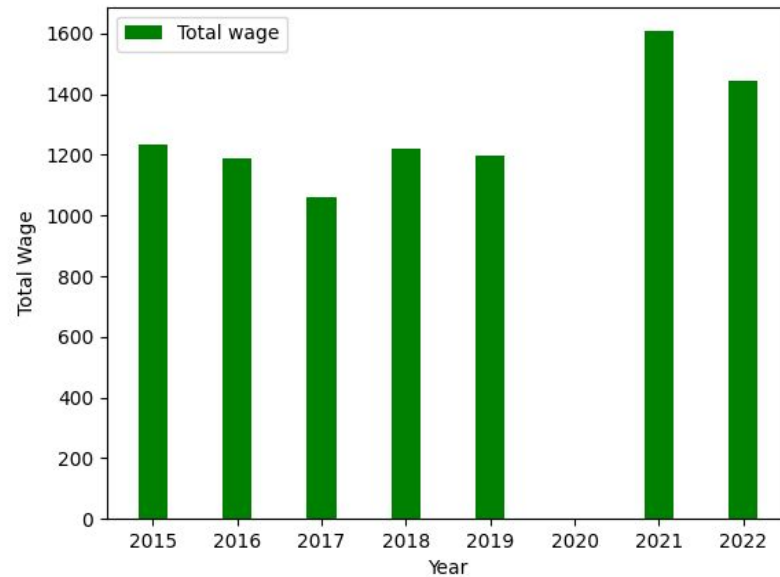
Total hourly wage spend on Software engineers and designers [2173] in Summer



Nova Scotia in *Fall*




Ontario in *Fall*





Question 2

Which **sectors** show the **highest** demand for **non-university** certificates or diplomas?





Why is this relevant?

- **Insight into the Job Market:** Understanding job vacancies by education sheds light on the demand for various levels of education across industries.
- **Educational Planning:** Helps students and educators align curriculum and training programs with market demand, ensuring relevant skill development.
- **Economic Indicators:** Job vacancies can act as an economic indicator, revealing trends in employment, economic health, and opportunities for workforce development.



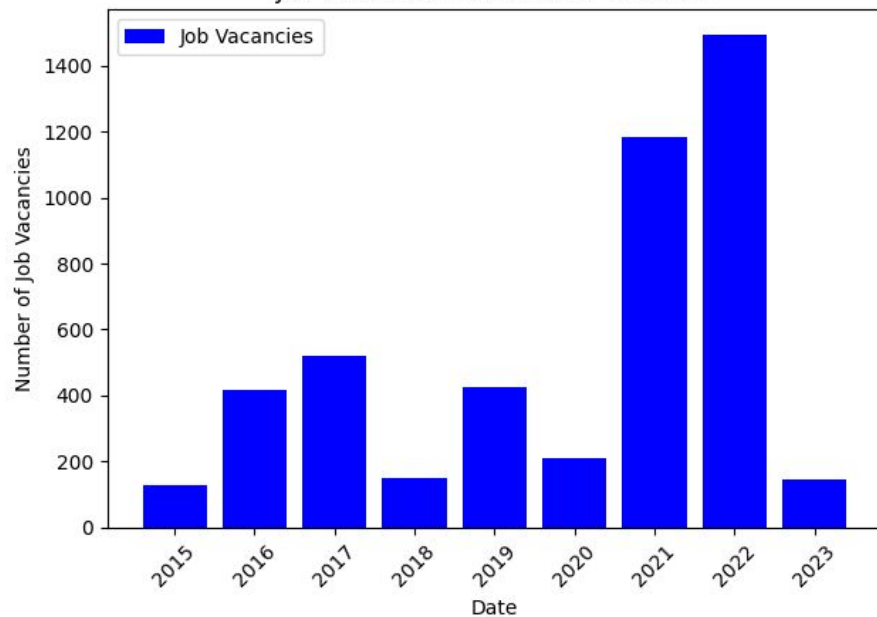
What are the parameters?

- **Geographical Location:** Analyze differences in job vacancy trends across provinces or territories, highlighting regional economic strengths and workforce needs.
- **Industry Sector:** Comparison of job vacancies in various sectors (e.g., software, healthcare) to identify high-demand fields.

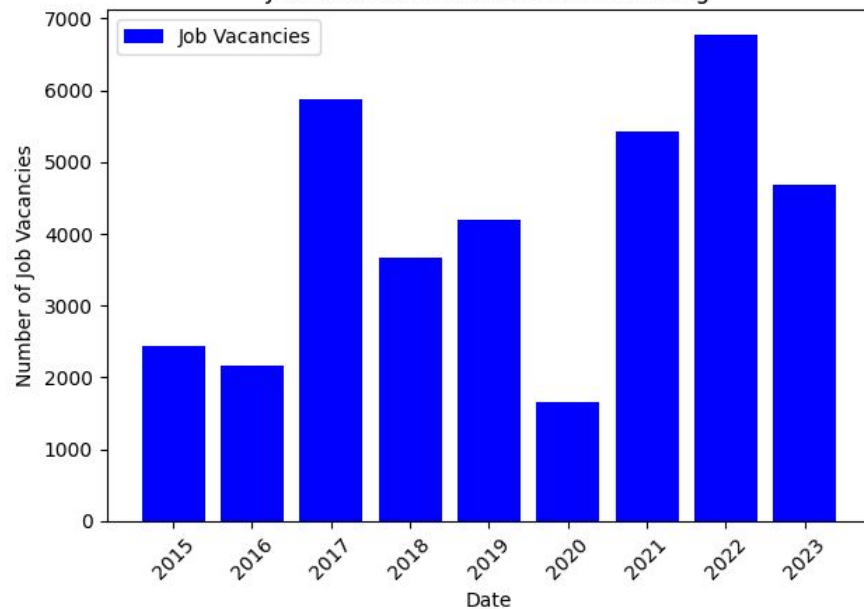


Visualization

Job Vacancies in Ontario for Software



Job Vacancies in Ontario for Marketing





Applying the Data

- **Career Guidance:** Assist job seekers and students in making informed decisions about their career paths based on market demand for their qualifications.
- **Identify Trends:** Analyze the rise or fall in job vacancies over time to predict future demands in specific sectors.
- **Regional Analysis:** Compare job vacancy trends across different regions to identify areas with a surplus or deficit of certain skills.



Question 3

What type of work positions are the most vacant in Canada for Software Engineers and Designers over the years?





Why this is relevant:

With the processed data we can ask question about the software engineering market.

- Are contract type of jobs taking over the market?
- Did Covid increase or decrease the amount of job vacancies?
- Do job vacancies grow exponentially or are the vacancies a static amount?



How was the program constructed

- The data was pre-process by taking the 1400328.csv file and filtering by Software Engineers and job vacancies.
- The processed data is further filtered by province and type of work/position that is chosen by the user
- The data is displayed in a table and able to be graphed as a bar graph

Pre_process_question3.py is the file to pre process and only needs itself and the 1400328.csv file.

MileStone_Final.py just needs itself to run and has menus for each input required by the user.



What can be varied?

- Region (specific provinces or all)
- Type of work (full or part-time)
- Type of position (permanent, temporary, seasonal)

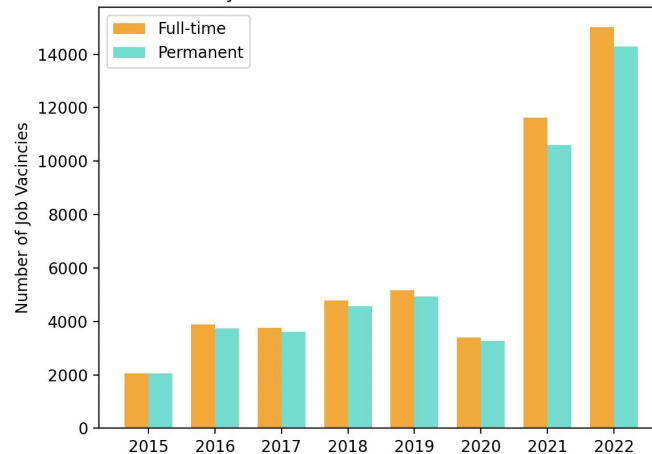
Job vacancies for software engineers in Ontario by full-time and permanent positions.

```
REF_DATE,GEO,Job vacancy characteristics,VALUE
2015,Ontario,Full-time,2055
2015,Ontario,Permanent,2045
2016,Ontario,Full-time,3895
2016,Ontario,Permanent,3740
2017,Ontario,Full-time,3765
2017,Ontario,Permanent,3610
2018,Ontario,Full-time,4785
2018,Ontario,Permanent,4580
2019,Ontario,Full-time,5170
2019,Ontario,Permanent,4925
2020,Ontario,Full-time,3400
2020,Ontario,Permanent,3275
2021,Ontario,Full-time,11630
2021,Ontario,Permanent,10595
2022,Ontario,Full-time,15005
2022,Ontario,Permanent,14280
```

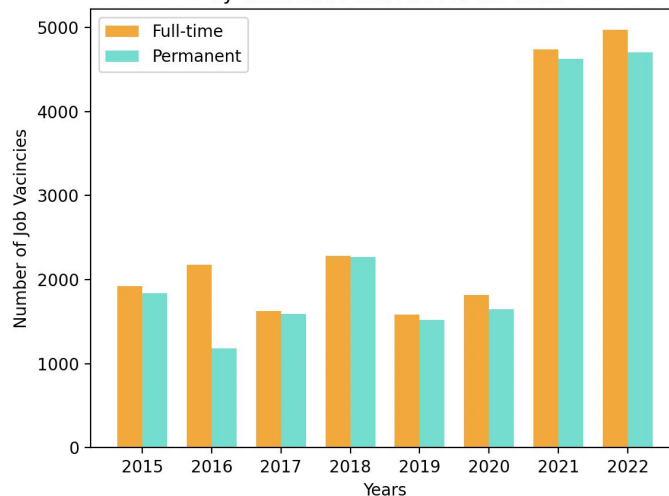
What can we do with the data?

- Comparing job vacancies between provinces.
- Ontario vs British Columbia, we can see a spike after covid in both provinces
- BC has a static grow rate while Ontario's grows each year.

Job Vacancies in Ontario for Software Engineers and Designers by Work and Position over the Years




Job Vacancies in British Columbia for Software Engineers and Designers by Work and Position over the Years





Question 4

How do the different levels of education play a role in job vacancies for total occupational classifications?





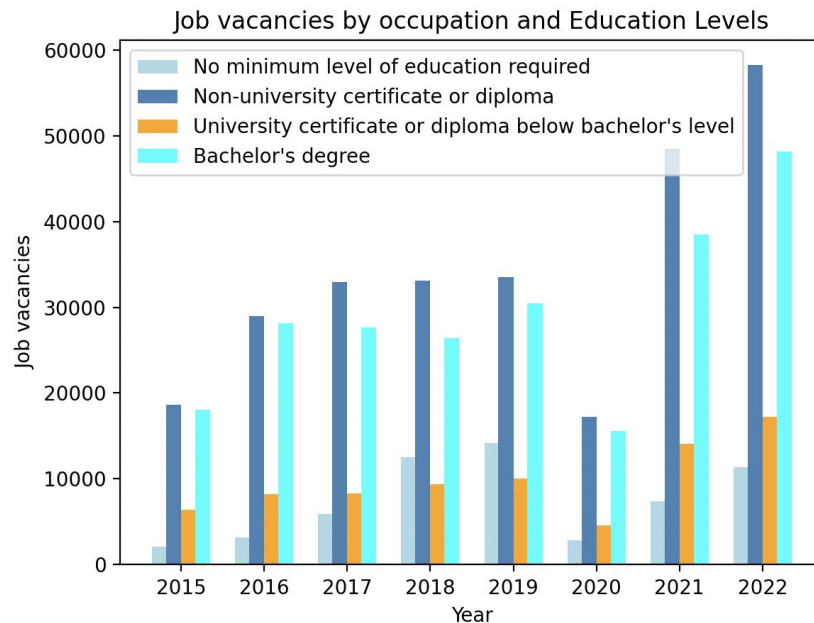
Significance of this.

- Sheds light on the relationship between education levels and job vacancies within various occupational classifications. Understanding how different levels of education influence job opportunities can provide valuable insights into the labor market dynamics.
- Identify educational pathways
- Address skills gaps
- Promote workforce diversity
- Inform policy decisions



Graph Example

- On the right we have the job vacancy stats for over the years based on the Financial occupation in Canada.
- What the graph can tell us is how different level of education plays a big role in number of job vacancy.



Thank You

Hope you enjoyed the presentation of the software system

Lots of love - team Tianjin

