Project Report: Role of the Analyst in Decision-Making Using Descriptive Analytics

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1. Introduction

Descriptive analytics is a crucial component of data analysis, focusing on summarizing past data to gain actionable insights for decision-making. The role of an analyst in this process is not merely to report raw data but to interpret it in a way that enables decision-makers to choose the best course of action.

This project aims to determine the most suitable city to live in, based on various socio-economic factors, using a structured SQL query approach. Several variables, such as income, cost of living, and crime rates, were analyzed to arrive at an evidence-based conclusion.

2. Objectives

The main objective of this project is to evaluate cities based on critical parameters that influence the quality of life, including:

- Median Income (2021)

- Median Wage for Data Analysts (2021)

- Cost of Living (e.g., rent and electricity expenses)

- Safety (violent crime rates and police-to-civilian ratio)

- Health Services (average hospital wait times)

The final goal is to identify the city that offers the best balance of these factors, providing a clear recommendation for decision-making.

3. Methodology

3.1 Data Collection

The data was collected from multiple sources:

- Employment data (median income and median wages for data analysts in 2021).

- Cost of living data (rent for one-bedroom apartments in 2022 and electricity costs).

- Crime statistics (violent crime rates and police-to-civilian ratio).

- Health service data (average hospital wait times).

3.2 Data Selection Criteria

To make a data-driven decision, the following variables were selected:

- Median Income (2021): This reflects the general income levels in the city and indicates the financial well-being of its citizens.

- Median Wage for Data Analysts (2021): Specific to professionals in the data analysis field, this variable is particularly relevant for those entering or already in this industry.

- 2022 Rent for a One-Bedroom Apartment: This is a direct reflection of the affordability of housing, a crucial aspect of cost of living.

- 2022 Electricity Cost: Another critical factor in cost of living, this variable impacts the day-to-day expenses of residents.

- Violent Crime Rate: This indicates the safety level of a city, which is often a primary concern for residents.

- Police-to-Civilian Ratio: A measure of law enforcement presence, giving an additional perspective on the safety and response capabilities.

- Average Hospital Wait Time: A key indicator of access to healthcare services, this variable reflects the efficiency and availability of health services in a city.

3.3 SQL Query for Data Extraction

The SQL query used to extract and combine the relevant data is as follows:

```
SELECT
 c.City,
 e.median_income_2021 AS median_income,
 e.median_wage_data_analysts_2021 AS median_wage_DA,
```

```
    cl.Rent_2022_1BD AS rent_1bhk,

    cl.Electricity_2022 AS electricity_cost,

    cr.violent_crime AS violent_crime,

    cr.police_to_civilian_rate AS police_ratio,

    c.Avg_Wait_Time_Hospitals AS hosp_wait_time
FROM

    City c
JOIN

    Employment e ON c.id = e.city_id
JOIN

    COSTOFLIVING cl ON c.City = cl.City
JOIN

    Crime cr ON e.City = cr.City;
```

4. Data Analysis

The SQL query produced a table that compared various cities based on the aforementioned parameters. Key focus areas included income, cost of living, safety, and healthcare access. The cities were analyzed, and the results were evaluated in the following manner:

- Median Income and Wages: Higher values indicate better earning potential, both generally and specifically for data analysts.

- Cost of Living (Rent and Electricity): Lower costs are preferable, as they reduce the financial burden on residents.

- Safety (Crime Rates and Police Ratio): Lower violent crime rates and a balanced police-to-civilian ratio are indicative of a safer living environment.

- Healthcare (Hospital Wait Times): Shorter wait times for hospital services suggest better healthcare access and efficiency.
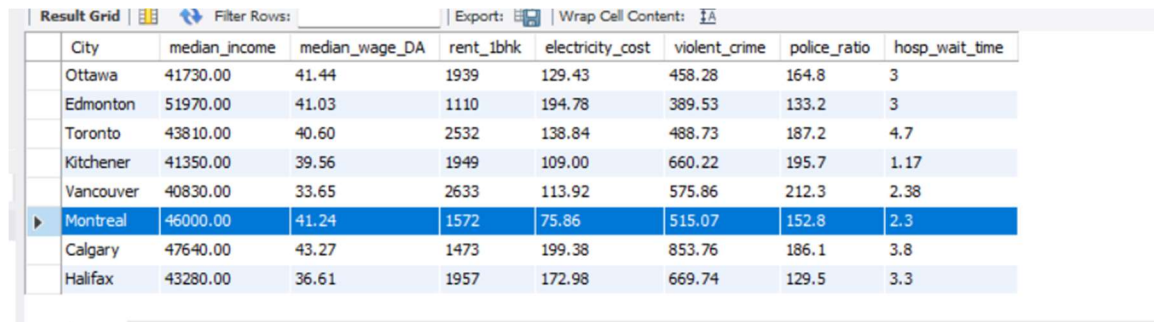
5. Findings

Based on the data analysis, the following key insights were derived:

- Montreal emerged as the most favorable city. It offers strong job opportunities, particularly for data analysts, with a competitive median income. Additionally, Montreal's median rent and electricity costs are among the most affordable.

- The city also demonstrated a reasonable balance in terms of safety, with a median police-to-civilian ratio. While violent crime rates were moderate, they were not alarmingly high.

- A notable concern for Montreal is its relatively long hospital wait times, which rank among the highest. However, this was not deemed a critical factor compared to the affordability and job prospects.

6. Screenshot of SQL Query Results

The following is a screenshot of the table generated by the SQL query:

City	median_income	median_wage_DA	rent_1bhk	electricity_cost	violent_crime	police_ratio	hosp_wait_time
Ottawa	41730.00	41.44	1939	129.43	458.28	164.8	3
Edmonton	51970.00	41.03	1110	194.78	389.53	133.2	3
Toronto	43810.00	40.60	2532	138.84	488.73	187.2	4.7
Kitchener	41350.00	39.56	1949	109.00	660.22	195.7	1.17
Vancouver	40830.00	33.65	2633	113.92	575.86	212.3	2.38
Montreal	46000.00	41.24	1572	75.86	515.07	152.8	2.3
Calgary	47640.00	43.27	1473	199.38	853.76	186.1	3.8
Halifax	43280.00	36.61	1957	172.98	669.74	129.5	3.3

7. Conclusion

The analysis concluded that Montreal is the best city to live in based on the criteria set forth. The city offers a well-rounded package of affordable living, good job prospects, and a reasonable safety environment. Despite the slightly longer hospital wait times, the overall balance of factors makes Montreal a highly recommended choice for prospective residents.

8. Recommendations

For individuals or families considering relocation, it is recommended to prioritize factors such as job opportunities, cost of living, and safety, as these have the most immediate impact on quality of life. In cases where healthcare access is of paramount importance, further investigation into healthcare facilities and services in the region may be warranted.