**Part 1:**

Database: Financial market statistics, as at Wednesday, Bank of Canada

Release date: 2024-02-16.

Statistics Canada. Table 10-10-0145-01 Financial market statistics, as at Wednesday, Bank of Canada

DOI: <https://doi.org/10.25318/1010014501-eng>

Note that the data downloaded is only from 02/14/2019 to 02/14/2024 (60 months) using the preexisting filters in the Bank of Canada website.

**The average bank rate and prime rate and Chartered bank administered interest rates - Prime rate in each 6-months period over the past 5 years.**

**Code:**

# Load the required libraries

library(readr)

library(dplyr)

# Load the dataframe, which has been previously cleaned

Question\_1 <- read\_csv("Question 1.csv")

# View the dataframe to see how it looks

View(Question\_1)

# Group the data into 6-month periods

Question\_1 <- mutate(Question\_1, Period = cut(REF\_DATE, breaks = "6 months"))

Q1a <- Question\_1 %>%

filter(Rates %in% c("Bank rate", "Chartered bank administered interest rates - Prime rate"))

# Calculate the average bank rate and prime rate for each period

average\_rates <- Q1a %>%

group\_by(Rates, Period) %>%

summarise(Avg\_Bank\_Rate = mean(VALUE))

# Display the results

View(average\_rates)A screenshot of a computer

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**The average rate change period in days:**

# Calculate the difference in days between consecutive rate changes for each type of rate

Question\_1 <- Question\_1 %>%

group\_by(Rates) %>%

mutate(Days\_Between\_Changes = c(0, diff(REF\_DATE))) %>%

filter(Days\_Between\_Changes != 0)

# Calculate the average rate change period in days for each type of rate

average\_change\_period <- Question\_1 %>%

group\_by(Rates) %>%

summarise(Avg\_Change\_Period = mean(Days\_Between\_Changes))

# Display the results

print(average\_change\_period)

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**Unique (Distinct) bank rates and the frequency of each rate.**

# Filter out non-bank rates

bank\_rates <- Question\_1 %>%

filter(Rates == "Bank rate")

# Count the frequency of each bank rate

unique\_bank\_rate <- bank\_rates %>%

group\_by(VALUE) %>%

summarise(Frequency = n())

# Display the results

print(unique\_bank\_rate)

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**Arrange the data frame above by frequencies.**

# Arrange the dataframe in descending order

unique\_bank\_rate <- unique\_bank\_rate %>%

arrange(desc(Frequency))

# Display the results

print(unique\_bank\_rate)

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**Part 2:**

Database: Labour force characteristics by province, monthly, seasonally adjusted

Release date: 2024-02-09.

Statistics Canada. Table 14-10-0287-03 Labour force characteristics by province, monthly, seasonally adjusted

DOI: <https://doi.org/10.25318/1410028701-eng>

Note that the data downloaded is only from both sexes, age group 25 to 54 years and only from January 2023 and 2024 using the preexisting filters in the Bank of Canada website.

**Growth of population, Full-time employment, Part-time employment, and Unemployment rates between first and last months, in Ontario, Alberta, BC and overall Canada.**

**Code:**

# Load the required libraries

library(dplyr)

library(tidyr)

# Load the dataframe, which has been previously cleaned

Question\_2 <- read\_csv("Question 2.csv")

# View the dataframe to see how it looks

View(Question\_2)

# Filter data for the relevant provinces

Q2a <- Question\_2 %>%

filter(GEO %in% c("Ontario", "Alberta", "British Columbia", "Canada"),

Labour\_force\_characteristics %in% c("Population", "Full-time employment", "Part-time employment", "Unemployment"),

REF\_DATE %in% c("Jan-24", "Jan-23"))

# Calculate growth rates

growth\_rates <- Q2a %>%

group\_by(GEO, Labour\_force\_characteristics) %>%

summarise(Growth\_Rate = ((VALUE[REF\_DATE == "Jan-24"] - VALUE[REF\_DATE == "Jan-23"]) / VALUE[REF\_DATE == "Jan-23"]) \* 100)

# Display the results

print(growth\_rates)

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**Part-time employment rate (expressed as a percentage of the labour force) of each province, in descending Part-time employment rate order using last month data.**

#Q2b

# Filter the required data for analysis

Q2b <- Question\_2 %>%

filter(Labour\_force\_characteristics %in% c("Part-time employment", "Labour force"),

REF\_DATE == "Jan-24")

# Calculate Part-time employment rate as a percentage of the labor force

part\_time\_rate <- Q2b %>%

group\_by(GEO) %>%

mutate(Part\_time\_Employment\_Rate = (sum(VALUE[Labour\_force\_characteristics == "Part-time employment"]) /

sum(VALUE[Labour\_force\_characteristics == "Labour force"])) \* 100) %>%

select(GEO, Part\_time\_Employment\_Rate) %>%

arrange(desc(Part\_time\_Employment\_Rate))

# Display the results

print(part\_time\_rate)

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**Generate a data frame to analyse the employment/unemployment rate in each province using only last month data, for all the regions.**

#Q2c

# Filter the required data for analysis

Q2c <- Question\_2 %>%

filter(Labour\_force\_characteristics %in% c("Employment rate", "Unemployment rate"),

REF\_DATE == "Jan-24")

# Make a dataframe with the requested information

employment\_unemployment\_rate <- Q2c %>%

group\_by(GEO) %>%

select(GEO, Labour\_force\_characteristics, VALUE) %>%

arrange(GEO)

# Display the results

print(employment\_unemployment\_rate)

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Looking at the data insights that we can extract from R, the overall level of Employment and Unemployment level in Canada is 84.1% and 5.1% respectively. In this regard, we can observe that most of the provinces maintain a high level of both Employment and Unemployment with the highest of 86.8% and 8.4% and the lowest of 80.9% and 3.4% respectively, which means that all provinces are doing a really good job at maintaining the employment levels and there is no province underperforming.