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| **2023 MFRE SUMMER PROGRAM** |  |
| **R Workshop 2: Data Manipulation and Visualization** | |
| **CASE** | |
| You cleared the initial hurdles and got your bearings in R. Now it’s time to dig into the data. After doing a bit of work, you show it to your colleague, Hadley, to get some advice. When he finally stops laughing, he tells you, “I’ve got a better way to do this,” and starts telling you about this “Tidyverse” thing he’s been working on. You’ve never seen it before, but he knows his stuff and you’re tired of getting laughed at, so you decide to take his advice and give the Tidyverse a go. | |

1. **Introduction to Data Cleaning: `dplyr`**
   1. What is the Tidyverse?
   2. 5+1 Functions
   3. `select()`
   4. `mutate()`
   5. `filter()`
   6. `arrange()`
   7. Pipes
   8. `summarise()`
   9. `group\_by()`
2. **Introduction to Data Visualization: `ggplot2`**
   1. Basics of `ggplot2`
   2. Line Charts
   3. Scatter Plots

**Case study: Analyzing Food Price Inflation in Canada**

**Sources of Data set**: [https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501](https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810000501)

**Sample Questions**

1. Creating new dataframes with subsets of our starting dataframe’s columns.
   1. `select()`
2. Creating new variables by performing arithmetic operations on a dataframe’s existing columns.
   1. `mutate()`
3. Reducing a dataframe to only the rows which meet certain value conditions.
   1. `filter()`
4. How can you get the samples with the lowest 10 values in a certain variable?
   1. `arrange()` and pipes
5. How can you get summary statistics of food price inflation, grouped by decade?
   1. `group\_by()` and `summarise()`
6. Visualizing a line chart with multiple data series.
   1. `ggplot()`, `geom\_line()`, `aes()`, `labs()`, and `scale\_color\_manual()`
7. Visualizing a scatter plot with a best-fit line.
   1. `ggplot()`, `geom\_point()`, `geom\_smooth()`, `aes()`, and `labs()`