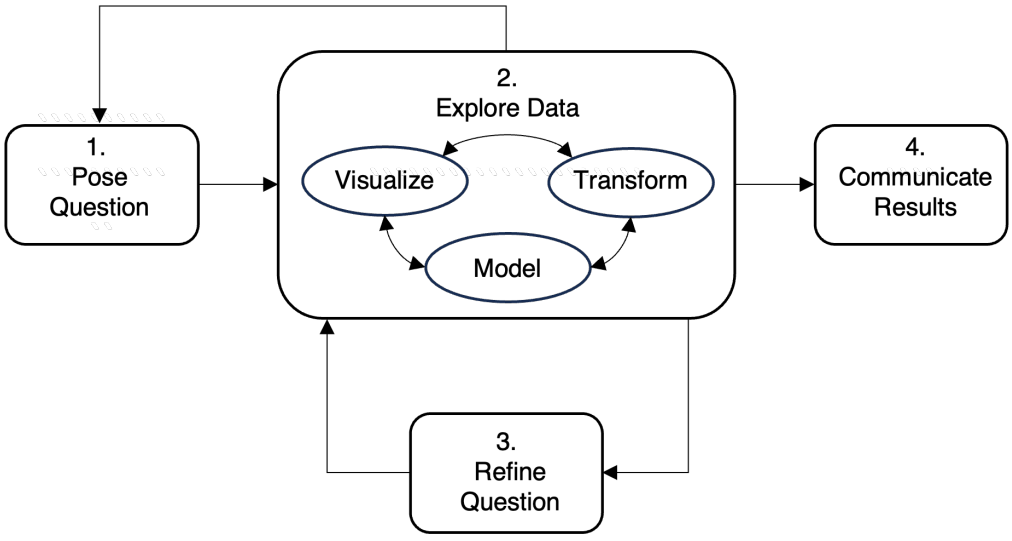
CT5102 Assignment 6 - Exploratory Data Analysis

Objective

The aim of this assignment is to use the exploratory data analysis (see below) process on a tibble that you have been allocated. Here are the guidelines:

- Pose **three questions** to explore as part of your analysis, and then generate insights from the data using the tools of the tidyverse. You may also find the package `lubridate` useful when dealing with processing dates. Any modelling activity can be simple and performed using appropriate functions in `ggplot2`.
- Try and find a data set that you could link with the tibble and generate insights from this (as part of your three questions).
- Encode all your analysis in a quarto markdown file, and submit this along with a PDF output.



Dataset 1: `nyc_bikes` in the CRAN package `tsibbledata`

```
library(dplyr)
library(tsibbledata)

glimpse(nyc_bikes)
```

```
Rows: 4,268
Columns: 12
$ bike_id       <fct> 26301, 26301, 26301, 26301, 26301, 26301, 26301, 26301, ~
$ start_time    <dttm> 2018-02-26 19:11:03, 2018-02-27 07:52:49, 2018-02-27 12~
$ stop_time     <dttm> 2018-02-26 19:15:40, 2018-02-27 07:58:13, 2018-02-27 12~
$ start_station <fct> 3186, 3203, 3202, 3638, 3638, 3187, 3638, 3639, 3202, 36~
$ start_lat     <dbl> 40.71959, 40.72760, 40.72722, 40.72429, 40.72429, 40.721~
$ start_long    <dbl> -74.04312, -74.04425, -74.03376, -74.03548, -74.03548, -~
$ end_station   <fct> 3203, 3202, 3638, 3638, 3187, 3638, 3639, 3202, 3638, 32~
$ end_lat       <dbl> 40.72760, 40.72722, 40.72429, 40.72429, 40.72112, 40.724~
$ end_long      <dbl> -74.04425, -74.03376, -74.03548, -74.03548, -74.03805, -~
$ type          <fct> Subscriber, Subscriber, Subscriber, Subscriber, Subscrib~
$ birth_year    <dbl> 1986, 1979, 1963, 1984, 1980, 1980, 1989, 1962, 1992, 19~
$ gender        <fct> Male, Male, Male, Male, Male, Male, Male, Male, Male, Ma~
```

Dataset 2: `flights` in the CRAN package `nycflights23`

```
library(dplyr)
library(nycflights23)

glimpse(flights)
```

```
Rows: 435,352
Columns: 19
$ year           <int> 2023, 2023, 2023, 2023, 2023, 2023, 2023, 2023, 2023, 2~
$ month          <int> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1~
$ day            <int> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1~
$ dep_time       <int> 1, 18, 31, 33, 36, 503, 520, 524, 537, 547, 549, 551, 5~
$ sched_dep_time <int> 2038, 2300, 2344, 2140, 2048, 500, 510, 530, 520, 545, ~
$ dep_delay      <dbl> 203, 78, 47, 173, 228, 3, 10, -6, 17, 2, -10, -9, -7, -~
$ arr_time       <int> 328, 228, 500, 238, 223, 808, 948, 645, 926, 845, 905, ~
$ sched_arr_time <int> 3, 135, 426, 2352, 2252, 815, 949, 710, 818, 852, 901, ~
$ arr_delay      <dbl> 205, 53, 34, 166, 211, -7, -1, -25, 68, -7, 4, -13, -14~
$ carrier        <chr> "UA", "DL", "B6", "B6", "UA", "AA", "B6", "AA", "UA", "~
$ flight         <int> 628, 393, 371, 1053, 219, 499, 996, 981, 206, 225, 800,~
$ tailnum        <chr> "N25201", "N830DN", "N807JB", "N265JB", "N17730", "N925~
$ origin         <chr> "EWR", "JFK", "JFK", "JFK", "EWR", "EWR", "JFK", "EWR",~
$ dest           <chr> "SMF", "ATL", "BQN", "CHS", "DTW", "MIA", "BQN", "ORD",~
$ air_time       <dbl> 367, 108, 190, 108, 80, 154, 192, 119, 258, 157, 164, 1~
$ distance       <dbl> 2500, 760, 1576, 636, 488, 1085, 1576, 719, 1400, 1065,~
$ hour           <dbl> 20, 23, 23, 21, 20, 5, 5, 5, 5, 5, 5, 6, 5, 6, 6, 6, 6,~
$ minute         <dbl> 38, 0, 44, 40, 48, 0, 10, 30, 20, 45, 59, 0, 59, 0, 0, ~
$ time_hour      <dttm> 2023-01-01 20:00:00, 2023-01-01 23:00:00, 2023-01-01 2~
```