Bike Share Toronto Data (2018)

```
[sudo] password for root:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  libfontconfig1 libfontenc1 libgd3 libjbig0 libjpeg62-turbo libjpeg8 libjpeg8-empty liblcms2-2 libtiff5 libwebp6 libwebpdemux2 libwebpmux3 libxfont1 libxfont2 libxpm4 libxslt1.1 libxtst6 libzip4 lsof t1utils tcl tcl8.6 tcl-tclxml tk tk8.6 x11-utils zip zlib1g-dev
0 upgraded, 34 newly installed, 0 to remove and 0 not upgraded.
Need to get 24.2 MB/24.2 MB archives.
After 111 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libfontenc1 amd64 1:1.1.4-1build1 [14.0 kB]
Get:2 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libjpeg8-empty amd64 8c-2ubuntu8 [2,824 B]
Get:3 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libjpeg8 amd64 8c-2ubuntu8 [2,264 B]
Get:4 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libjpeg62-turbo amd64 2.0.3-0ubuntu1.2 [134 kB]
Get:5 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libjbig0 amd64 2.1-3.1ubuntu0.20.04.1 [26.2 kB]
Get:6 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libwebp6 amd64 0.6.1-2.1ubuntu0.20.04.1 [185 kB]
Get:7 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libwebpdemux2 amd64 0.6.1-2.1ubuntu0.20.04.1 [13.2 kB]
Get:8 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libwebpmux3 amd64 0.6.1-2.1ubuntu0.20.04.1 [23.8 kB]
Get:9 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libtiff5 amd64 4.1.0+git191117-2ubuntu0.20.04.14 [161 kB]
Get:10 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 liblcms2-2 amd64 2.9-4ubuntu0.1 [150 kB]
Get:11 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libgd3 amd64 2.2.5-5.2ubuntu2.1 [125 kB]
Get:12 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libxfont1 amd64 1:2.0.3-1 [93.6 kB]
Get:13 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libxfont2 amd64 2.0.4-1 [94.2 kB]
Get:14 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libxpm4 amd64 1:3.5.13-1 [37.2 kB]
Get:15 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libxslt1.1 amd64 1.1.34-4ubuntu0.20.04.1 [151 kB]
Get:16 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libxtst6 amd64 2:1.2.3-1 [12.8 kB]
Get:17 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libzip4 amd64 1.5.1-4ubuntu0.1 [45.4 kB]
Get:18 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 lsof amd64 4.93.2+dfsg-1.1ubuntu0.20.04.1 [238 kB]
Get:19 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 t1utils amd64 1.41-2 [56.8 kB]
Get:20 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 tcl8.6 amd64 8.6.10+dfsg-1ubuntu0.1 [1,039 kB]
Get:21 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 tcl amd64 8.6.9+1 [5,422 B]
Get:22 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 tcl-tclxml amd64 3.3-1build1 [118 kB]
Get:23 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 tk8.6 amd64 8.6.10-1ubuntu0.1 [748 kB]
Get:24 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 tk amd64 8.6.9+1 [5,474 B]
Get:25 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 x11-utils amd64 7.7+5ubuntu0.1 [206 kB]
Get:26 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 zip amd64 3.0-11ubuntu1.1 [158 kB]
Get:27 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 zlib1g-dev amd64 1:1.2.11.dfsg-2ubuntu1.5 [3,140 B]
Fetched 24.2 MB in 2s (12.1 MB/s)
Selecting previously unselected package libfontenc1:amd64.
(Reading database ... 160000 files and directories currently installed.)
Preparing to unpack .../00-libfontenc1_1:1.1.4-1build1_amd64.deb ...
Unpacking libfontenc1:amd64 (1:1.1.4-1build1) ...
Selecting previously unselected package libjpeg8-empty:amd64.
Preparing to unpack .../01-libjpeg8-empty_8c-2ubuntu8_amd64.deb ...
Unpacking libjpeg8-empty:amd64 (8c-2ubuntu8) ...
Selecting previously unselected package libjpeg8:amd64.
Preparing to unpack .../02-libjpeg8_8c-2ubuntu8_amd64.deb ...
Unpacking libjpeg8:amd64 (8c-2ubuntu8) ...
Selecting previously unselected package libjpeg62-turbo:amd64.
Preparing to unpack .../03-libjpeg62-turbo_2.0.3-0ubuntu1.2_amd64.deb ...
Unpacking libjpeg62-turbo:amd64 (2.0.3-0ubuntu1.2) ...
Selecting previously unselected package libjbig0:amd64.
Preparing to unpack .../04-libjbig0_2.1-3.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libjbig0:amd64 (2.1-3.1ubuntu0.20.04.1) ...
Selecting previously unselected package libwebp6:amd64.
Preparing to unpack .../05-libwebp6_0.6.1-2.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libwebp6:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Selecting previously unselected package libwebpdemux2:amd64.
Preparing to unpack .../06-libwebpdemux2_0.6.1-2.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libwebpdemux2:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Selecting previously unselected package libwebpmux3:amd64.
Preparing to unpack .../07-libwebpmux3_0.6.1-2.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libwebpmux3:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Selecting previously unselected package libtiff5:amd64.
Preparing to unpack .../08-libtiff5_4.1.0+git191117-2ubuntu0.20.04.14_amd64.deb ...
Unpacking libtiff5:amd64 (4.1.0+git191117-2ubuntu0.20.04.14) ...
Selecting previously unselected package liblcms2-2:amd64.
Preparing to unpack .../09-liblcms2-2_2.9-4ubuntu0.1_amd64.deb ...
Unpacking liblcms2-2:amd64 (2.9-4ubuntu0.1) ...
Selecting previously unselected package libgd3:amd64.
Preparing to unpack .../10-libgd3_2.2.5-5.2ubuntu2.1_amd64.deb ...
Unpacking libgd3:amd64 (2.2.5-5.2ubuntu2.1) ...
Selecting previously unselected package libxfont1:amd64.
Preparing to unpack .../11-libxfont1_1:2.0.3-1_amd64.deb ...
Unpacking libxfont1:amd64 (1:2.0.3-1) ...
Selecting previously unselected package libxfont2:amd64.
Preparing to unpack .../12-libxfont2_2.0.4-1_amd64.deb ...
Unpacking libxfont2:amd64 (2.0.4-1) ...
Selecting previously unselected package libxpm4:amd64.
Preparing to unpack .../13-libxpm4_1:3.5.13-1_amd64.deb ...
Unpacking libxpm4:amd64 (1:3.5.13-1) ...
Selecting previously unselected package libxslt1.1:amd64.
Preparing to unpack .../14-libxslt1.1_1.1.34-4ubuntu0.20.04.1_amd64.deb ...
Unpacking libxslt1.1:amd64 (1.1.34-4ubuntu0.20.04.1) ...
Selecting previously unselected package libxtst6:amd64.
Preparing to unpack .../15-libxtst6_2:1.2.3-1_amd64.deb ...
Unpacking libxtst6:amd64 (2:1.2.3-1) ...
Selecting previously unselected package libzip4:amd64.
Preparing to unpack .../16-libzip4_1.5.1-4ubuntu0.1_amd64.deb ...
Unpacking libzip4:amd64 (1.5.1-4ubuntu0.1) ...
Selecting previously unselected package lsof.
Preparing to unpack .../17-lsof_4.93.2+dfsg-1.1ubuntu0.20.04.1_amd64.deb ...
Unpacking lsof (4.93.2+dfsg-1.1ubuntu0.20.04.1) ...
Selecting previously unselected package t1utils.
Preparing to unpack .../18-t1utils_1.41-2_amd64.deb ...
Unpacking t1utils (1.41-2) ...
Selecting previously unselected package tcl8.6.
Preparing to unpack .../19-tcl8.6_8.6.10+dfsg-1ubuntu0.1_amd64.deb ...
Unpacking tcl8.6 (8.6.10+dfsg-1ubuntu0.1) ...
Selecting previously unselected package tcl.
Preparing to unpack .../20-tcl_8.6.9+1_amd64.deb ...
Unpacking tcl (8.6.9+1) ...
Selecting previously unselected package tcl-tclxml.
Preparing to unpack .../21-tcl-tclxml_3.3-1build1_amd64.deb ...
Unpacking tcl-tclxml (3.3-1build1) ...
Selecting previously unselected package tk8.6.
Preparing to unpack .../22-tk8.6_8.6.10-1ubuntu0.1_amd64.deb ...
Unpacking tk8.6 (8.6.10-1ubuntu0.1) ...
Selecting previously unselected package tk.
Preparing to unpack .../23-tk_8.6.9+1_amd64.deb ...
Unpacking tk (8.6.9+1) ...
Selecting previously unselected package x11-utils.
Preparing to unpack .../24-x11-utils_7.7+5ubuntu0.1_amd64.deb ...
Unpacking x11-utils (7.7+5ubuntu0.1) ...
Selecting previously unselected package zip.
Preparing to unpack .../25-zip_3.0-11ubuntu1.1_amd64.deb ...
Unpacking zip (3.0-11ubuntu1.1) ...
Selecting previously unselected package zlib1g-dev:amd64.
Preparing to unpack .../26-zlib1g-dev_1:1.2.11.dfsg-2ubuntu1.5_amd64.deb ...
Unpacking zlib1g-dev:amd64 (1:1.2.11.dfsg-2ubuntu1.5) ...
Setting up libxtst6:amd64 (2:1.2.3-1) ...
Setting up libxslt1.1:amd64 (1.1.34-4ubuntu0.20.04.1) ...
Setting up libxfont2:amd64 (2.0.4-1) ...
Setting up libzip4:amd64 (1.5.1-4ubuntu0.1) ...
Setting up libxpm4:amd64 (1:3.5.13-1) ...
Setting up libwebpmux3:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Setting up libfontenc1:amd64 (1:1.1.4-1build1) ...
Setting up libxfont1:amd64 (1:2.0.3-1) ...
Setting up libwebpdemux2:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Setting up libjpeg8-empty:amd64 (8c-2ubuntu8) ...
Setting up libjpeg8:amd64 (8c-2ubuntu8) ...
Setting up libjpeg62-turbo:amd64 (2.0.3-0ubuntu1.2) ...
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Setting up libtiff5:amd64 (4.1.0+git191117-2ubuntu0.20.04.14) ...
Setting up liblcms2-2:amd64 (2.9-4ubuntu0.1) ...
Setting up libgd3:amd64 (2.2.5-5.2ubuntu2.1) ...
Setting up lsof (4.93.2+dfsg-1.1ubuntu0.20.04.1) ...
Setting up t1utils (1.41-2) ...
Setting up tcl8.6 (8.6.10+dfsg-1ubuntu0.1) ...
Setting up tcl (8.6.9+1) ...
Setting up tcl-tclxml (3.3-1build1) ...
Setting up tk8.6 (8.6.10-1ubuntu0.1) ...
Setting up tk (8.6.9+1) ...
Setting up x11-utils (7.7+5ubuntu0.1) ...
Setting up zip (3.0-11ubuntu1.1) ...
Setting up zlib1g-dev:amd64 (1:1.2.11.dfsg-2ubuntu1.5) ...
Processing triggers for libgdk-pixbuf2.0-0:amd64 (2.40.0+dfsg-3ubuntu2.1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
```

```
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Get:15 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libxslt1.1 amd64 1.1.34-4ubuntu0.20.04.1 [151 kB]
Get:16 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 libxtst6 amd64 2:1.2.3-1 [12.8 kB]
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Get:25 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 x11-utils amd64 7.7+5ubuntu0.1 [206 kB]
Get:26 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 zip amd64 3.0-11ubuntu1.1 [158 kB]
Get:27 http://archive.ubuntu.com/ubuntu/ focal-updates/main amd64 zlib1g-dev amd64 1:1.2.11.dfsg-2ubuntu1.5 [3,140 B]
Fetched 24.2 MB in 2s (12.1 MB/s)
Selecting previously unselected package libfontenc1:amd64.
(Reading database ... 160000 files and directories currently installed.)
Preparing to unpack .../00-libfontenc1_1:1.1.4-1build1_amd64.deb ...
Unpacking libfontenc1:amd64 (1:1.1.4-1build1) ...
Selecting previously unselected package libjpeg8-empty:amd64.
Preparing to unpack .../01-libjpeg8-empty_8c-2ubuntu8_amd64.deb ...
Unpacking libjpeg8-empty:amd64 (8c-2ubuntu8) ...
Selecting previously unselected package libjpeg8:amd64.
Preparing to unpack .../02-libjpeg8_8c-2ubuntu8_amd64.deb ...
Unpacking libjpeg8:amd64 (8c-2ubuntu8) ...
Selecting previously unselected package libjpeg62-turbo:amd64.
Preparing to unpack .../03-libjpeg62-turbo_2.0.3-0ubuntu1.2_amd64.deb ...
Unpacking libjpeg62-turbo:amd64 (2.0.3-0ubuntu1.2) ...
Selecting previously unselected package libjbig0:amd64.
Preparing to unpack .../04-libjbig0_2.1-3.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libjbig0:amd64 (2.1-3.1ubuntu0.20.04.1) ...
Selecting previously unselected package libwebp6:amd64.
Preparing to unpack .../05-libwebp6_0.6.1-2.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libwebp6:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Selecting previously unselected package libwebpdemux2:amd64.
Preparing to unpack .../06-libwebpdemux2_0.6.1-2.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libwebpdemux2:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Selecting previously unselected package libwebpmux3:amd64.
Preparing to unpack .../07-libwebpmux3_0.6.1-2.1ubuntu0.20.04.1_amd64.deb ...
Unpacking libwebpmux3:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Selecting previously unselected package libtiff5:amd64.
Preparing to unpack .../08-libtiff5_4.1.0+git191117-2ubuntu0.20.04.14_amd64.deb ...
Unpacking libtiff5:amd64 (4.1.0+git191117-2ubuntu0.20.04.14) ...
Selecting previously unselected package liblcms2-2:amd64.
Preparing to unpack .../09-liblcms2-2_2.9-4ubuntu0.1_amd64.deb ...
Unpacking liblcms2-2:amd64 (2.9-4ubuntu0.1) ...
Selecting previously unselected package libgd3:amd64.
Preparing to unpack .../10-libgd3_2.2.5-5.2ubuntu2.1_amd64.deb ...
Unpacking libgd3:amd64 (2.2.5-5.2ubuntu2.1) ...
Selecting previously unselected package libxfont1:amd64.
Preparing to unpack .../11-libxfont1_1:2.0.3-1_amd64.deb ...
Unpacking libxfont1:amd64 (1:2.0.3-1) ...
Selecting previously unselected package libxfont2:amd64.
Preparing to unpack .../12-libxfont2_2.0.4-1_amd64.deb ...
Unpacking libxfont2:amd64 (2.0.4-1) ...
Selecting previously unselected package libxpm4:amd64.
Preparing to unpack .../13-libxpm4_1:3.5.13-1_amd64.deb ...
Unpacking libxpm4:amd64 (1:3.5.13-1) ...
Selecting previously unselected package libxslt1.1:amd64.
Preparing to unpack .../14-libxslt1.1_1.1.34-4ubuntu0.20.04.1_amd64.deb ...
Unpacking libxslt1.1:amd64 (1.1.34-4ubuntu0.20.04.1) ...
Selecting previously unselected package libxtst6:amd64.
Preparing to unpack .../15-libxtst6_2:1.2.3-1_amd64.deb ...
Unpacking libxtst6:amd64 (2:1.2.3-1) ...
Selecting previously unselected package libzip4:amd64.
Preparing to unpack .../16-libzip4_1.5.1-4ubuntu0.1_amd64.deb ...
Unpacking libzip4:amd64 (1.5.1-4ubuntu0.1) ...
Selecting previously unselected package lsof.
Preparing to unpack .../17-lsof_4.93.2+dfsg-1.1ubuntu0.20.04.1_amd64.deb ...
Unpacking lsof (4.93.2+dfsg-1.1ubuntu0.20.04.1) ...
Selecting previously unselected package t1utils.
Preparing to unpack .../18-t1utils_1.41-2_amd64.deb ...
Unpacking t1utils (1.41-2) ...
Selecting previously unselected package tcl8.6.
Preparing to unpack .../19-tcl8.6_8.6.10+dfsg-1ubuntu0.1_amd64.deb ...
Unpacking tcl8.6 (8.6.10+dfsg-1ubuntu0.1) ...
Selecting previously unselected package tcl.
Preparing to unpack .../20-tcl_8.6.9+1_amd64.deb ...
Unpacking tcl (8.6.9+1) ...
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Selecting previously unselected package tk8.6.
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Unpacking tk8.6 (8.6.10-1ubuntu0.1) ...
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Preparing to unpack .../23-tk_8.6.9+1_amd64.deb ...
Unpacking tk (8.6.9+1) ...
Selecting previously unselected package x11-utils.
Preparing to unpack .../24-x11-utils_7.7+5ubuntu0.1_amd64.deb ...
Unpacking x11-utils (7.7+5ubuntu0.1) ...
Selecting previously unselected package zip.
Preparing to unpack .../25-zip_3.0-11ubuntu1.1_amd64.deb ...
Unpacking zip (3.0-11ubuntu1.1) ...
Selecting previously unselected package zlib1g-dev:amd64.
Preparing to unpack .../26-zlib1g-dev_1:1.2.11.dfsg-2ubuntu1.5_amd64.deb ...
Unpacking zlib1g-dev:amd64 (1:1.2.11.dfsg-2ubuntu1.5) ...
Setting up libxtst6:amd64 (2:1.2.3-1) ...
Setting up libxslt1.1:amd64 (1.1.34-4ubuntu0.20.04.1) ...
Setting up libxfont2:amd64 (2.0.4-1) ...
Setting up libzip4:amd64 (1.5.1-4ubuntu0.1) ...
Setting up libxpm4:amd64 (1:3.5.13-1) ...
Setting up libwebpmux3:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Setting up libfontenc1:amd64 (1:1.1.4-1build1) ...
Setting up libxfont1:amd64 (1:2.0.3-1) ...
Setting up libwebpdemux2:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Setting up libjpeg8-empty:amd64 (8c-2ubuntu8) ...
Setting up libjpeg8:amd64 (8c-2ubuntu8) ...
Setting up libjpeg62-turbo:amd64 (2.0.3-0ubuntu1.2) ...
Setting up libjbig0:amd64 (2.1-3.1ubuntu0.20.04.1) ...
Setting up libwebp6:amd64 (0.6.1-2.1ubuntu0.20.04.1) ...
Setting up libtiff5:amd64 (4.1.0+git191117-2ubuntu0.20.04.14) ...
Setting up liblcms2-2:amd64 (2.9-4ubuntu0.1) ...
Setting up libgd3:amd64 (2.2.5-5.2ubuntu2.1) ...
Setting up lsof (4.93.2+dfsg-1.1ubuntu0.20.04.1) ...
Setting up t1utils (1.41-2) ...
Setting up tcl8.6 (8.6.10+dfsg-1ubuntu0.1) ...
Setting up tcl (8.6.9+1) ...
Setting up tcl-tclxml (3.3-1build1) ...
Setting up tk8.6 (8.6.10-1ubuntu0.1) ...
Setting up tk (8.6.9+1) ...
Setting up x11-utils (7.7+5ubuntu0.1) ...
Setting up zip (3.0-11ubuntu1.1) ...
Setting up zlib1g-dev:amd64 (1:1.2.11.dfsg-2ubuntu1.5) ...
Processing triggers for libgdk-pixbuf2.0-0:amd64 (2.40.0+dfsg-3ubuntu2.1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
```

Visualize Data

```
# Import dataset
!wget -q -O /tmp/bikeshare.zip https://ibm.box.com/shared/static/tf0yryt7jgo9ogsqzgqvxzqqcqqqqqqq.zip
!unzip -qq -d /tmp/ -o /tmp/bikeshare.zip
!ls -lh /tmp/bikeshare.*
!head -n 5 /tmp/bikeshare.csv
```

```
-rw-r--r-- 1 root root 1.5M Jan 15 20:24 /tmp/bikeshare.csv
-rw-r--r-- 1 root root 1.5M Jan 15 20:24 /tmp/bikeshare.zip
trip_id,duration,start_date,start_station,start_terminal,end_date,end_station,end_terminal,bike_number,subscriber_type
"4480","570","2015-03-31 22:16","Davenport at Yonge","3000","2015-03-31 22:26","Davenport at Yonge","3000","W00869","Casual"
"4549","1035","2015-04-01 09:29","Front at Yonge","3008","2015-04-01 09:46","King at Jarvis","3009","W00869","Casual"
"4550","1026","2015-04-01 09:46","King at Jarvis","3009","2015-04-01 10:03","Front at Yonge","3008","W00869","Casual"
```

```
# Import the Pandas library
import pandas as pd
# Load the dataset into a dataframe
df = pd.read_csv("/tmp/bikeshare.csv")
# Parse the dates in the "start_date" column.
df['start_date'] = pd.to_datetime(df['start_date'])
# Set the index to be the "start_date" column.
df.set_index('start_date', inplace=True)
# Look at the first few rows
df.head(5)
```

	trip_id	duration	start_station	start_terminal	end_station	end_terminal	bike_number	subscriber_type
start_date								
2015-03-31 22:16:00	4480	570	Davenport at Yonge	3000	Davenport at Yonge	3000	W00869	Casual
2015-04-01 09:29:00	4549	1035	Front at Yonge	3008	King at Jarvis	3009	W00869	Casual
2015-04-01 09:46:00	4550	1026	King at Jarvis	3009	Front at Yonge	3008	W00869	Casual
2015-04-01 10:03:00	4551	1035	Front at Yonge	3008	King at Jarvis	3009	W00869	Casual
2015-04-01 10:20:00	4552	1026	King at Jarvis	3009	Front at Yonge	3008	W00869	Casual

```
# Set the figure size in inches
import matplotlib.pyplot as plt
%matplotlib inline
plt.rcParams['figure.figsize'] = (15, 3)
# Plot the dataset, and save the resulting object
ax = df['duration'].plot(linewidth=0.5);
# Show the plot
ax.set_title('Raw Trip Data');
ax.set_xlabel('');
ax.set_ylabel('Duration');
```

```
/usr/local/lib/python3.6/dist-packages/IPython/core/magics/pylab_magic.py:201: UserWarning: Pyplot family of methods for figure/subplot manipulation. Use methods of the figure object instead.
  fig = self.shell.ensure_fig_manager(num=num).canvas.figure
```

```
# Create a resampled dataset.
df_resampled = df.resample('W').sum()
# Look at the first few rows.
df_resampled.head(5)
```

	trip_id	duration
start_date		
2015-03-29	4480	570
2015-04-05	165295	71779
2015-04-12	167069	73797
2015-04-19	167926	74689
2015-04-26	172332	77878

```
# Plot the resampled dataset.
ax = df_resampled.plot(linewidth=0.5);
# Set the title.
ax.set_title('Weekly Trips');
ax.set_xlabel('');
ax.set_ylabel('Duration');
```

```
# Create a dataset by count of rides.
df_count = df_resampled[['duration']].copy(deep=True)
df_count.rename(inplace=True, {'duration': 'count'})
df_count['count'] = df_count['count'] / 60
# Look at the first few rows.
df_count.head(5)
```

	count
start_date	
2015-03-29	9.500000
2015-04-05	1196.316667
2015-04-12	1229.950000
2015-04-19	1244.816667
2015-04-26	1297.966667

```
# Plot the dataset.
ax = df_count.plot(linewidth=0.5);
# Set the title.
ax.set_title('Weekly Count');
ax.set_xlabel('');
ax.set_ylabel('Count');
```

```
# Create a dataset by count of rides.
df_count = df[['duration']].copy(deep=True)
df_count.rename(inplace=True, {'duration': 'count'})
df_count['count'] = df_count['count'] / 60
# Look at the first few rows.
df_count.head(5)
```

	count
start_date	
2015-03-31 22:16:00	9.500000
2015-04-01 09:29:00	17.250000
2015-04-01 09:46:00	17.100000
2015-04-01 10:03:00	17.250000
2015-04-01 10:20:00	17.100000

```
# Plot the dataset.
ax = df_count.plot(linewidth=0.5);
# Set the title.
ax.set_title('Trip Count');
ax.set_xlabel('');
ax.set_ylabel('Count');
```

```
# Create a dataset by count of rides.
df_count = df[['duration']].copy(deep=True)
df_count.rename(inplace=True, {'duration': 'count'})
df_count['count'] = df_count['count'] / 60
# Look at the first few rows.
df_count.head(5)
```

	count
start_date	
2015-03-31 22:16:00	9.500000
2015-04-01 09:29:00	17.250000
2015-04-01 09:46:00	17.100000
2015-04-01 10:03:00	17.250000
2015-04-01 10:20:00	17.100000

```
# Plot the dataset.
ax = df_count.plot(linewidth=0.5);
# Set the title.
ax.set_title('Trip Count');
ax.set_xlabel('');
ax.set_ylabel('Count');
```

Toronto Weather Data (2018)

```
# Download weather data.
!wget -q -O /tmp/weather.zip https://ibm.box.com/shared/static/kxmx3ldqqqqqqqqqqqqq.zip
!unzip -qq -d /tmp/ -o /tmp/weather.zip
!ls -lh /tmp/weather.*
!head -n 5 /tmp/weather.csv
```

```
-rw-r--r-- 1 root root 1.1M Jan 15 20:24 /tmp/weather.csv
-rw-r--r-- 1 root root 1.1M Jan 15 20:24 /tmp/weather.zip
"Longitude (x)","Latitude (y)","Station Name","Climate ID","Date/Time","Year","Month","Day","Time","Temp_C","Dew Point Temp_C","Rel Hum_%","Wind Spd_km/h","Wind Dir_10s","Visibility_km","Stn_Press_kPa","Hmdx","Wind Chill"
-79.4000,43.7500,TORONTO LESLIE STREET CS,6158731,2018-01-01 00:00:00,2018,1,1,00:00,-7.5,-12.5,65,9,23,4.8,97.53,,-14.0
-79.4000,43.7500,TORONTO LESLIE STREET CS,6158731,2018-01-01 01:00:00,2018,1,1,01:00,-7.6,-12.6,65,9,24,4.8,97.57,,-14.1
-79.4000,43.7500,TORONTO LESLIE STREET CS,6158731,2018-01-01 02:00:00,2018,1,1,02:00,-7.7,-12.7,65,9,24,4.8,97.61,,-14.2
-79.4000,43.7500,TORONTO LESLIE STREET CS,6158731,2018-01-01 03:00:00,2018,1,1,03:00,-7.8,-12.8,65,9,24,4.8,97.64,,-14.3
-79.4000,43.7500,TORONTO LESLIE STREET CS,6158731,2018-01-01 04:00:00,2018,1,1,04:00,-8.0,-13.0,65,9,24,4.8,97.68,,-14.5
```

```
# Import the Pandas library
import pandas as pd
# Load the dataset into a dataframe
df = pd.read_csv("/tmp/weather.csv")
# Parse the dates in the "Date/Time" column.
df['Date/Time'] = pd.to_datetime(df['Date/Time'])
# Set the index to be the "Date/Time" column.
df.set_index('Date/Time', inplace=True)
# Look at the first few rows
df.head(5)
```

	Longitude (x)	Latitude (y)	Station Name	Climate ID	Year	Month	Day	Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Spd_km/h	Wind Dir_10s	Visibility_km	Stn_Press_kPa	Hmdx	Wind Chill
Date/Time																	
2018-01-01 00:00:00	-79.4000	43.7500	TORONTO LESLIE STREET CS	6158731	2018	1	1	00:00	-7.5	-12.5	65	9	23	4.8	97.53	NaN	-14.0
2018-01-01 01:00:00	-79.4000	43.7500	TORONTO LESLIE STREET CS	6158731	2018	1	1	01:00	-7.6	-12.6	65	9	24	4.8	97.57	NaN	-14.1
2018-01-01 02:00:00	-79.4000	43.7500	TORONTO LESLIE STREET CS	6158731	2018	1	1	02:00	-7.7	-12.7	65	9	24	4.8	97

```
Name:0.0, 1.0, "Toronto Maximum Wind Speed (km/h)", "Count", "Toronto Maximum Wind Speed (km/h)"
```

```
df.describe()
df[df.isnull()].count()
df[df.isnull().any(axis=1)].count()
df[df.isnull().any(axis=1)].sum()
df[df.isnull().any(axis=1)].mean()
df[df.isnull().any(axis=1)].max()
df[df.isnull().any(axis=1)].min()
df[df.isnull().any(axis=1)].median()
df[df.isnull().any(axis=1)].mode()
df[df.isnull().any(axis=1)].sample(1)
df[df.isnull().any(axis=1)].sample(2)
df[df.isnull().any(axis=1)].sample(3)
df[df.isnull().any(axis=1)].sample(4)
df[df.isnull().any(axis=1)].sample(5)
df[df.isnull().any(axis=1)].sample(6)
df[df.isnull().any(axis=1)].sample(7)
df[df.isnull().any(axis=1)].sample(8)
df[df.isnull().any(axis=1)].sample(9)
df[df.isnull().any(axis=1)].sample(10)
df[df.isnull().any(axis=1)].sample(11)
df[df.isnull().any(axis=1)].sample(12)
df[df.isnull().any(axis=1)].sample(13)
df[df.isnull().any(axis=1)].sample(14)
df[df.isnull().any(axis=1)].sample(15)
df[df.isnull().any(axis=1)].sample(16)
df[df.isnull().any(axis=1)].sample(17)
df[df.isnull().any(axis=1)].sample(18)
df[df.isnull().any(axis=1)].sample(19)
df[df.isnull().any(axis=1)].sample(20)
df[df.isnull().any(axis=1)].sample(21)
df[df.isnull().any(axis=1)].sample(22)
df[df.isnull().any(axis=1)].sample(23)
df[df.isnull().any(axis=1)].sample(24)
df[df.isnull().any(axis=1)].sample(25)
df[df.isnull().any(axis=1)].sample(26)
df[df.isnull().any(axis=1)].sample(27)
df[df.isnull().any(axis=1)].sample(28)
df[df.isnull().any(axis=1)].sample(29)
df[df.isnull().any(axis=1)].sample(30)
df[df.isnull().any(axis=1)].sample(31)
df[df.isnull().any(axis=1)].sample(32)
df[df.isnull().any(axis=1)].sample(33)
df[df.isnull().any(axis=1)].sample(34)
df[df.isnull().any(axis=1)].sample(35)
df[df.isnull().any(axis=1)].sample(36)
df[df.isnull().any(axis=1)].sample(37)
df[df.isnull().any(axis=1)].sample(38)
df[df.isnull().any(axis=1)].sample(39)
df[df.isnull().any(axis=1)].sample(40)
```

Chart 1: Sample Bar Chart
Alpha
Beta
Gamma
Delta
Epsilon
Zeta
Eta
Theta
Iota
Kappa
Lambda
Mu
Nu
Xi
Omicron
Pi
Rho
Sigma
Tau
Upsilon
Phi
Chi
Psi
Omega
0
5
10
15
20
25
30
35
40
45
50
Value
Category