Popularity by Age

There is a strange peak of 50 yr olds biking in NY City. It is important to note that it is not influenced by those enjoying their first year of retirement, as retirement is only unpenalized in NY at the age of 55 after 30 years of work. Otherwise, the graph shows increasing bike usage following trends of increasing healthiness and environmental awareness.
It does not wholly follow trends of participation by age, despite 45-50 yr olds being the largest portion of NY cities citizens.[1]

Duration by Age

Oddly enough average duration by age varies wildly once the bikers hit roughly age 75. A potential culprit is misfiled or misreported age information, as there are several records of people who would be over 120 years old. An arbitrary age cutoff for filed records would enhance the accuracy of the data being provided to NY City.
For those younger than 75, the data follows a much more expected type of curve, where variation is much more minor and follow a steady increase as those users get younger.
There are two exceptions, those who are minors themselves and those who are 50. With young children there is potential of bikes being rented for long hours of play, but there is no such easy explanation for why 50 year olds, and 50 year olds alone, rent bikes so frequently and for such long hours. More research would be needed to find the exact reasons, but whatever they are if they can be replicated if other age groups it could boost sales significantly.

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[1] https://www.health.ny.gov/statistics/vital_statistics/2010/table01.htm

Unusual Durations

While most times the shape of a graph of total duration of trips vs month and day closely matches the shape of a graph of total number of trips vs the same. The displayed graph shows those days where there is a significant mismatch.

There is no single solution. Some dates match up with festivities and holidays, while others match up with weather. There are several days where trips are shorter than average and the weather is 10 F plus colder than it has been previously.[2]

Station Summer Popularity

As the date is progressed, there is the expected increase in bike rides when the summer season starts. While large blooms of riders are not constant, the average ridership remains higher than before.

The most popular stations are those downtown, along the riverbank, and around central park.

Popularity by Hour of Day

The peaks fall at rush hours as people avoid traffic. 8 in the morning and 5 in the evening.

The lows fall midway between them as expected and at 3 in the morning as everyone sleeps or is at their night job. Even the city that never sleeps apparently needs a break now and again.

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[2] https://www.accuweather.com/en/us/new-york-ny/10007/april-weather/349727