

1. Logins over time: This series fit a linear model nicely, showing increasing client logins over time. This increase could be due to the app's increasing popularity and success in this city. Low p-values and standard errors support the linear trend. The R-squared is low, but a low R-squared neither confirms nor denies the validity of a linear model, and we can visually confirm that the trend line fits reasonably. We can see a cyclical pattern of increases with a sharper increase towards the two observations at the end of each grouping of observations, most likely due to a weekly pattern, which the next chart makes clearer. There are two outliers to the cyclical pattern around April 22. These could have been due to a large event in the city, for example a concert or holiday.

2. Logins by day of week: Out of the three series, this series fits a linear model the best, with very low p-values and a very high R-squared. Visually, one can pick out three groups of observations: Monday through Wednesday, Thursday and Friday, and the weekend. These groups are most likely due to variation in the level of travel and in preferred methods of transportation over the week. Over the workweek, people are usually commuting to their commitments like work and school. Most likely, they are using public transit or their own vehicle. Regardless, because of the routine nature of the work week, the level of travel and methods of transportation used are stable, loosening up as we approach the weekend. During the weekend, logins greatly increase because people are traveling more when enjoying their leisure time. A second factor, which I believe is stronger, is that people are relying less on their standard modes of transportation because their intended destinations are different and they are facing different social expectations; one would not take the same bus one takes to work to go to a restaurant in another part of the city, and its more socially encouraged to use ridesharing for fun than for a commute, especially when splitting with friends who do not want their leisure disrupted by the inconveniences of public transportation.

3. Logins by hour of day: This series does not fit a linear model. In addition to high p-values and a very low R-squared, it is visually clear that the series is not linear, dipping down until 8 AM, climbing up and then plateauing for about six hours, and then surging. Logins are highest around 2 AM and lowest around 8 AM. I believe that these trends are driven mainly by social patterns over the day. People may be tired and impatient at night and prefer to take a direct ride to their location rather than public transportation, which requires waiting and sometimes transfers. Relatedly, they may feel unsafe taking public transportation at night. During working hours, people probably are not predominately using rideshare to commute since there are more affordable options like public transportation. Drivers may also be working another job or studying parttime (although a client would have to login first to find this out). Logins begin to surge after 7 PM, when people are off work and enjoying their leisure time, using rideshare to get to places.