**The references are made in overleaf and the pictures referenced are the one I am giving you in, ordered. If you want to add something while analyzing them feele free to do so or go deeper into it.  
  
Next is data observation:**First I started out with taking the data of the bike availability on average over the year, meaning I took the mean from every day and made a line to see how one day on average behaves when looking at the availability. The first thought would naturally be that at night, the available bikes at the stations would be going up and over the day go down or fluctuate up and down. What we were observing however, was that is was the condrary, and to quite the extent at that. When taking the mean from each station in each recorded city for this bachelor thesis (Dresden, Nürnberg, Essen and Heidelberg) you would see a massiv drop on available bikes at night and a high rise up until midday in bike availability[refferenc epicture 1], after which it starts to decrease again[reference to picture one]. This made us wonder, what is going on there. The first thing we did was crosscheck the data by looking at every city on its own to exclude the possibility of an extreme outlier. But apart from the City of Essen you had the exact curve as the typical average with a curve slightly shiftet in generell [reference to picture 2]]. When looking at Heidelberg you had the same phenomenon but it would increase much faster and than fluctuate over the day.  
  
So why is this the case ? To go and find that out, we first normalized the average data and were looking at the same graph but with additional features, namely booked bikes and returned bikes. We thought that when there are more bikes available, then the number of bookings must go down or at least must be way under the number of bike returns. So we added those two variables as avarages, normalized them and put them on top of our bike availability as you can see in picture [reference to picture 4] . Now we have a graph which shows that the bike availability, bikes returned and bikes booked are having all the same curve, but how can it be that while the amount of bikes returned and booked have roughly the same line as the bikes available ?   
Well, when looking at the Data from nextbike you can see, that for every 30 minutes there are also always datapoints which are just pointing to a single bike which is standing around at no particular station somewhere on the streets. Since our goal is to measure the bike availability for each station to give a proper prediction at a fixed station, those bikes were not yet included. So for clarification I got the datapoints from all those missing bikes and crosschecked them with our data [reference to picture 5]. The most likely reason for this can be customers who use the bikes at midday to drive home from there working places and park the biked somewhere close to their homes and drive back with them the next day. Another reason can also be the redistribution of bikes which were not brought back to their stations.