Cooper Golemme

HW 1: due Thurs, January 23 at 10pm

1. Construct the graph matching families and parks. Which park is the most popular? Which park is the least popular?

   Answer:

   The most visited park is Jumbo Kingdom with 676 Families visiting.

   The least visited park is Jumbo Golf Course with 185 Families visiting

2. Construct the graph matching hotels and parks, with edges weighted by the number of unique families that visit a park while staying at a given hotel. Include a visualization of this graph using the graph visualization program of your choice.

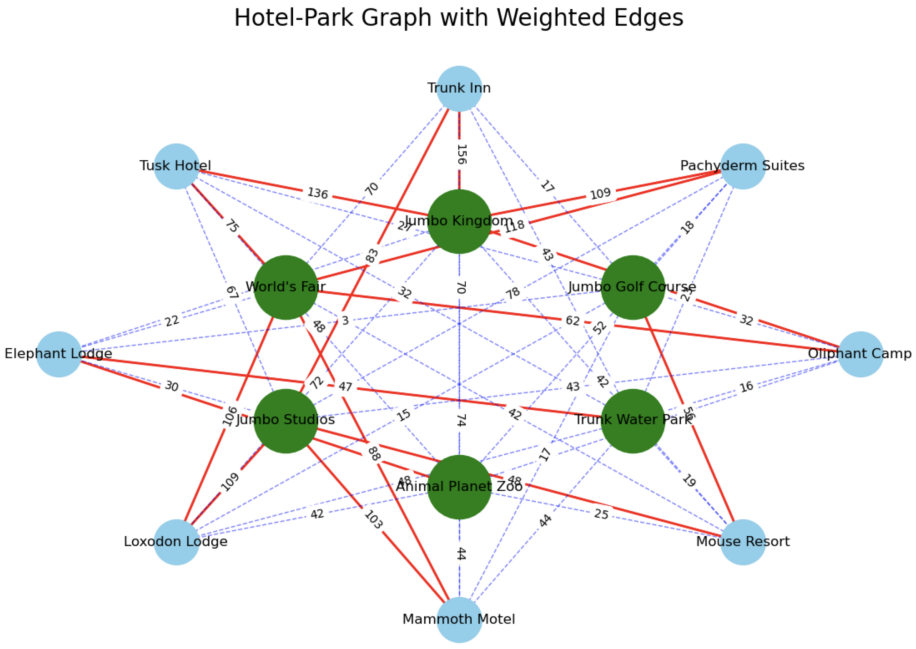

Figure 1: Hotel and park graph with weighted edges representing the number of unique families that visited the parks while staying at a given hotel.

3. Construct a graph of families, with edges between families if they visit at least two of the same parks.

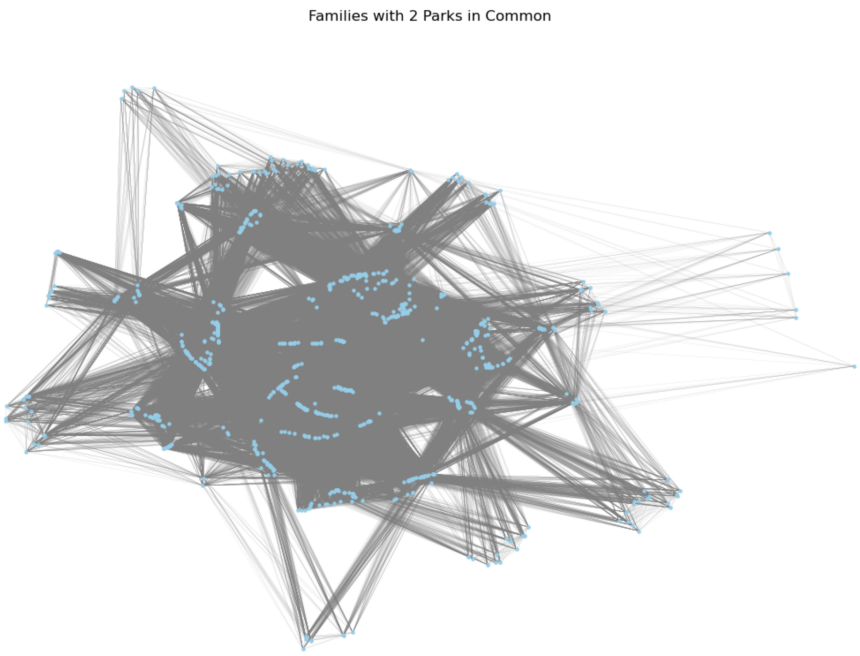

Figure 2: Graph showing connections between families that visited the same parks. A connection between two nodes indicates that the two families visited the same park on this weekend.

4. Construct the same graph, but add edges only if two families visited at least two of the same parks on the same day. How does the resulting graph change?

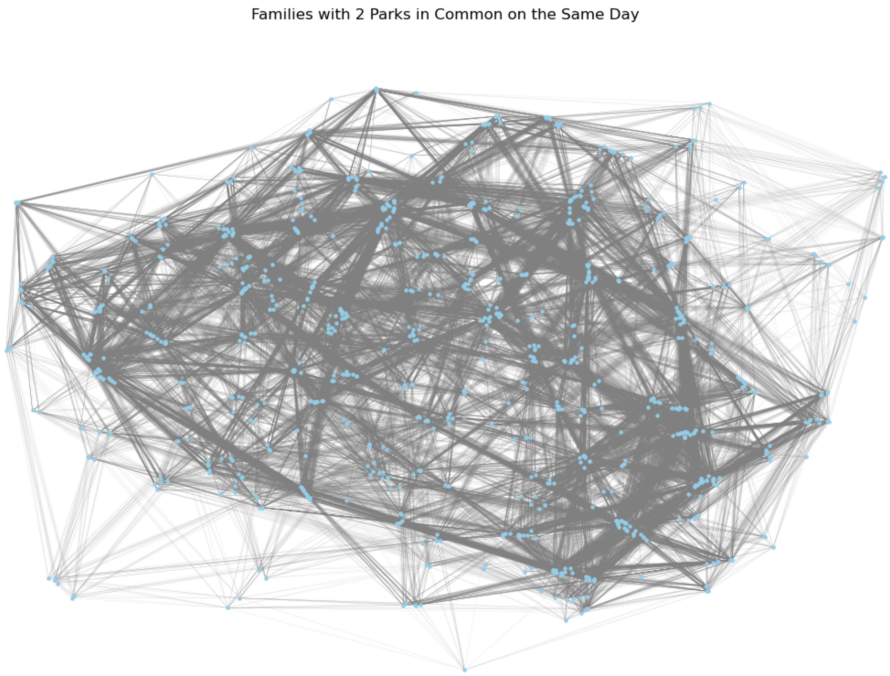

Figure 3: Graph showing the same thing as Figure 2 but only when the families visited the same park on the same day of the weekend.

The graph in Figure 3 is much less dense as compared to the graph in Figure 2. This makes sense; it is less common for the families to have visited the same park on the same day than to have just visited the same park sometime over the course of their weekend stay.

5. Families' choices of which hotel to stay at and parks to visit may be influenced by park geography. What might you be able to infer about park geography using the graphs you have made?

   The graph in Figure 1 provides a lot of insights into the geography of the park. We can infer from intuition that there is some correlation between the hotels that the families stayed at and the parks they visited over the course of the weekend. Either they are staying at hotels that are near the parks they want to visit, or they are visiting parks that are near hotels they wanted to stay. Either way, we can examine the connections of the network to understand how the park is likely laid out.

From Figure 1, we can see that some parks have very strong connections to many hotels (indicated by the red lines). This likely means that these parks are located in the center of the park, equally close to many hotels. Parks that fall into this category are Jumbo Studios, Jumbo Kingdom, and World's Fair.

The remainder of the parks are likely on the perimeter. Trunk Water Park and Animal Planet Zoo are probably on the perimeter of the park and close to Elephant Lodge because they only have strong connections to Elephant Lodge and none of the other hotels. Jumbo Golf Course is probably on the other side of the park on the perimeter and close to Mouse Resort because it has a strong connection to Mouse Resort and nowhere else.

We can infer a great deal about the geography of the park from the network that we created.