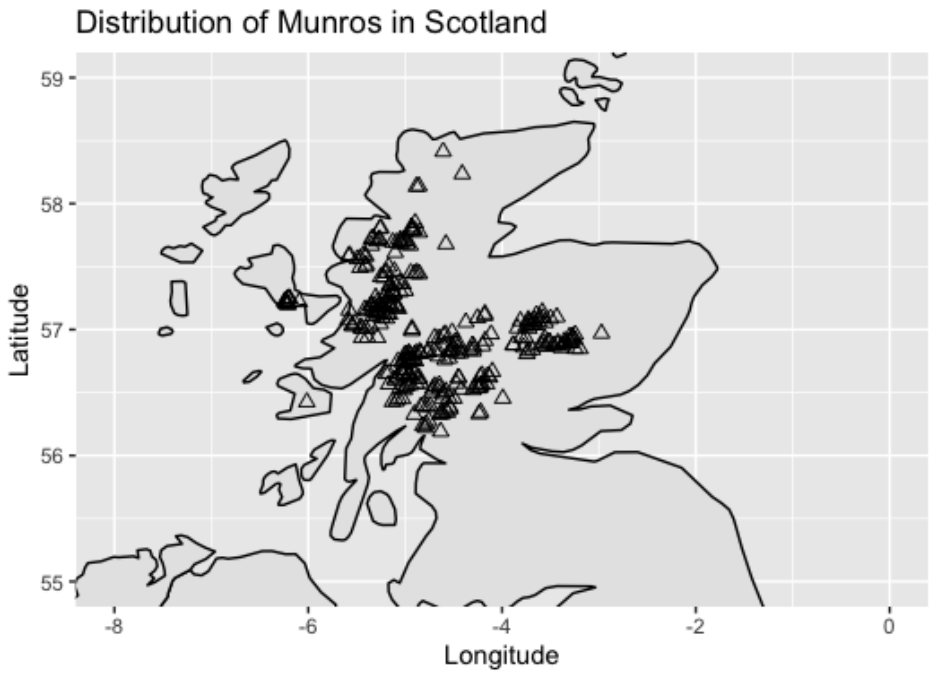
Busy Bees (Team 17) Data Challenge Report

Problem Statement: Munro bagging is a popular trend in Scotland but many Munros are remote and difficult to access.

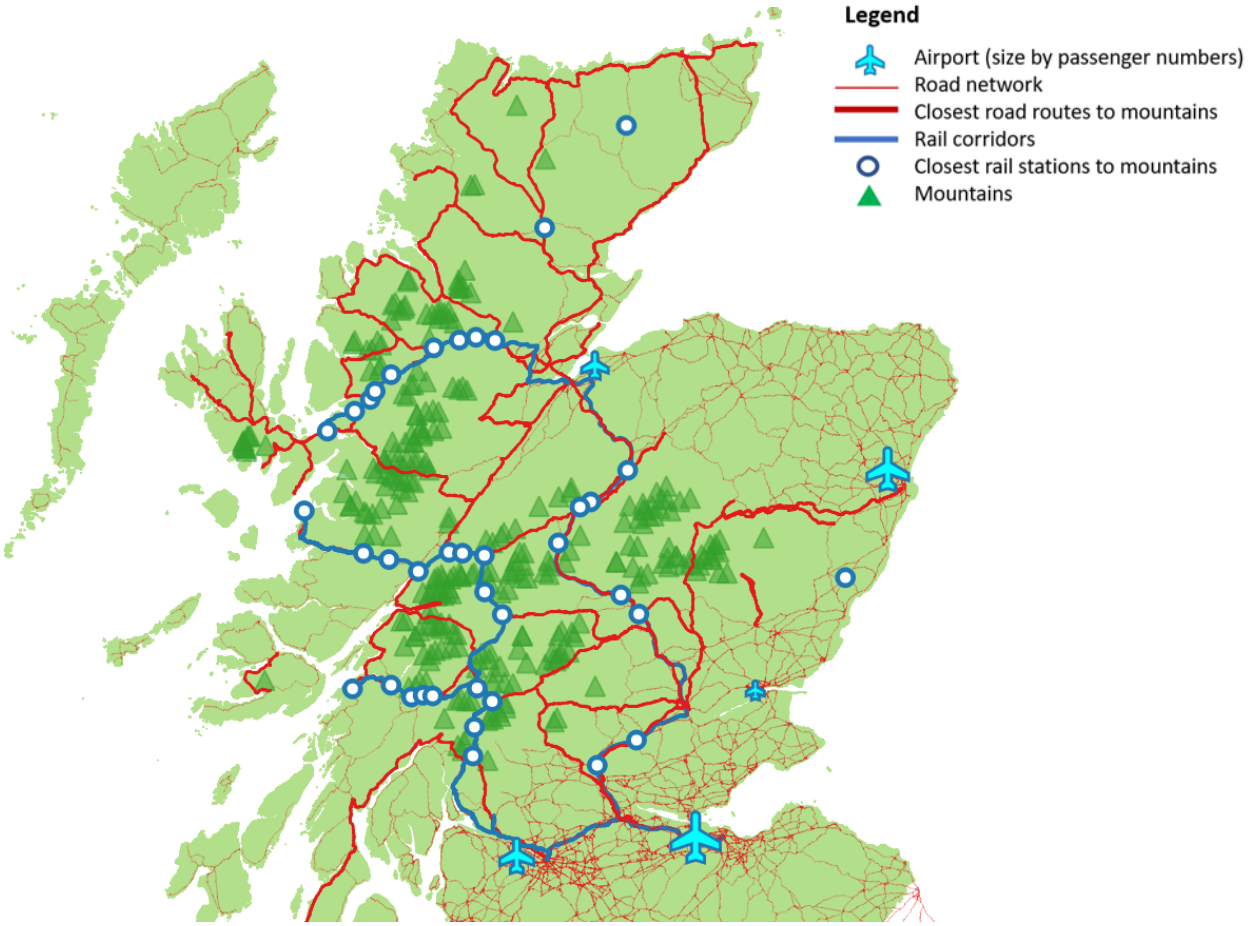
Climbing Munros and Munro bagging has become an increasingly popular trend for holiday makers in Scotland. With the rise in popularity of staycations, due to the restrictions of the pandemic, many people have looked at activities and challenges that can be found on our own doorsteps. A Munro is a mountain in Scotland that is over 3000 feet high and there are 282 munros in Scotland. The process of climbing all of the Munros in Scotland is known as Munro bagging and the challenge of completing as many of the Munros as possible is very enticing to a lot of travelers.

Munro bagging will appeal to a variety of tourists including adventure seekers from abroad who wish to sample the beautiful Scottish scenery. Furthermore, many locals in Scotland might wish to become one of the illustrious few who have climbed each of Scotland's peaks. This means we will need to ensure sufficient access and make sure to control congestion at each Munro.



The Munros are dispersed throughout Scotland (see above) which means that there are varying levels of difficulty to access them. We wish to encourage as many people as possible to visit these Munros with the minimum amount of effort as this will motivate them to continue on their Munro bagging adventure. Furthermore, improving the volume of visitors to each Munro would increase the amount of people looking to buy from local businesses in each area which would improve the sustainability of tourism in that area.

We believe that increasing the ease of transportation to these Munros would increase their popularity amongst tourists and encourage further tourists to want to bag some Munros. Therefore, using the various data sources provided we have collated information on the transport links to each Munro. We have created a dataset which, for each Munro, gives information on the rail, air and road transport access. For each Munro we also have its coordinate information and the height information of the Munro in feet and meters. For each Munro, the rail transport information includes the name and coordinates of the nearest train station along with the station's closest line and the maximum off-peak passengers by route. Furthermore, for each Munro, the air transport information includes the location of the nearest airport and the number of passengers arriving to this airport per continent per year. Finally, for each Munro, the dataset tells us the location of the closest road and the average traffic flow per day of that road. The comparative volumes of passenger and traffic numbers are high-level but indicate the scope for analysis and modelling the scope for modal shift to more sustainable transport means of accessing the mountains.



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The figure above displays some of the information found in the dataset we have created. The green triangles represent Munros and the blue airplanes represent airports, where the size of

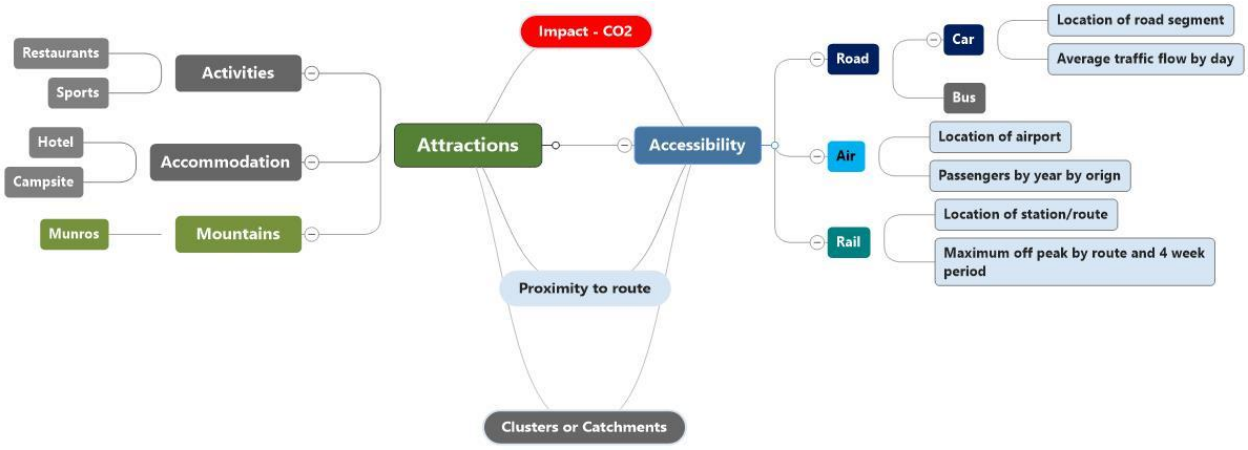
the plane is proportional to the size of the airport in terms of passenger traffic. Furthermore, the red lines represent roads and the dark blue lines represent the train lines in closest proximity to the mountains.

An online map is available here: https://arcg.is/y5y0S2

Using this data we could inform tourists, either from overseas or within Scotland, the best air, road and train options to get to their desired Munro. This would help tourists seamlessly get to their desired Munro, where they would invest in the surrounding local economy, which would encourage them to continue on their Munro bagging journey. Road and Rail networks share similar geographic corridors, not surprising given the terrain, and an analysis of investment opportunities within the rail network to benefit tourists and residents may encourage a modal shift and increased sustainability of travel.

There is still a lot of work to be done with this dataset. We would have loved to create more detailed maps which are interactive and show the best rail, road and air options for each individual traveler but unfortunately we are limited on time. We would have also loved to have incorporated the co2 emission values for each of the potential travelers respective trips. This would have allowed them to consider the ecological cost of each journey before booking but, once again, we were limited by time and available data. Clustering of Munros would also help focus attention on specific catchments for mountain access.

We have also thought about further improving this model to extend past Munros and we would like to incorporate accommodation sites or other activities into our model by calculating the best air, rail and road route to each destination, reinforcing the concept of a cluster-based catchment approach. The proposed model for our overall plans can be seen below.



As you can see we aimed to incorporate accessibility and travel data to the locations of attractions in order to give prospective tourists recommendations of places to go and the easiest way to reach these destinations.

The data table is attached as Appendix 1.