

# Project 1 Wrapper

James Root - CS 3600 - Spring 2021

## Question 1

One potential way to account for speed limits and traffic conditions would be to use these conditions as a multiplying factor upon the actual length heuristic of the road. This in turn would cause the heuristic to become more dependent upon time it takes to cross a stretch of road rather than the distance required. The actual multiplying factor may need to be tested and redeveloped multiple times in order to see what works the most effectively – whether it be a linear relationship, logistic relationship, or more complex relationship.

## Question 2

In this given case, it would be crucial to find an ideal balance between discouraging neighborhood travel and decreasing the overall time it takes for drivers to complete a route. If heuristic values of intersections were to be increased, the algorithm would increase the time it takes to travel through the neighborhoods. However, we may see the algorithm favor some routes in the neighborhood that minimize intersections. Meanwhile, if the speed limits were artificially increased, every path in the neighborhood would see a higher heuristic increase and would see a more effective reduction in neighborhood-crossing traffic. With this, it is important to note that users may take their own discretion and cut through the neighborhoods if they note an unusual increase in major freeway use. Without further adaptations to the algorithm, navigators with start or end points in a neighborhood may find the algorithm unfavorable, as they will be able to see more favorable routes to their destination. To combat this, the algorithm may need to have “bubbles” defined around start and end goals that reduce the penalty of neighborhood travel.

## Question 3

For the short term, AI routing systems make jobs more efficient, as the overall time it takes for tasks to be completed by the worker is reduced. For the most part, this is a positive impact. This mostly makes workers more efficient as they can rely on technology to assist them in completion of their tasks. It is important to weigh how routing systems increasing efficiency may either reduce the total amount of workers required to complete the same number of tasks for a company (which serves a negative impact for employees) or increase the overall output of a company (neutral for workers, positive for company). However, in the long term this may serve a negative impact on workers in certain industries. As automation takes the reigns of more navigation positions (automated tractor-trailers, etc.), routing algorithms would make automated positions more favorable since they are just as efficient for companies and would likely serve a cheaper cost.

## Question 4

One thing that comes to mind when considering how a routing system may change human behavior is how a human dependence on these systems may result in a less adventurous behavior for most humans. For example, if humans are always able to rely on systems to take them from point a to point b, they may never need to have their own understanding of their surroundings in their community and what places are close to each other. While this may seem like a non-influencing impact, human behavior may shift in a way that diminishes ideas of community, connections with neighbors, and economic

activity in surrounding businesses. Though this casts a dim future, this human behavior would likely only be provoked in a late-stage implementation of these routing systems – where cars are self-navigable and do not rely on any human observation or input.