**Name: Stephen Griffin**

**ID: 18482934**

Given facts in the form: route(Source, Destination, Distance, M)

speed(f, 5).

* Speed on foot

speed(c, 80).

* Speed on car

speed(t, 100).

* Speed on train

speed(p, 500).

* Speed on plane

Functions Used + Explanations:

travel\_modes/3 – Checks if (Source to Destination) can be travelled via String Mode

travel\_modes/4 – validates if Mode is in String turned Char

time/4 – Calculates the time taken via a certain travelMode

best\_mode\_in\_list/2 – Selects the best mode available to be used for a route

best\_mode\_rec/3 – Selects the best recommended route (comparing speeds when traversing said route with different travelModes)

timeQueue/3/5 – Queue that stores time values which are accessed when comparing different travel modes

ogNode/3/5 – predicate that stores original nodes (parent nodes) and checks if the queue has an existing node (checks for parent nodes)

insertNode/5 – inserts node if time is faster and satisfies prior conditions (Valid travelMode, and lower time)

deleteNode/5 – deletes node when the case arrives (conflict / overwrite) which indicates that a faster route has been found

Dijkstra/6 – main Dijkstra predicate which handles the flow of the update, insert and deletion of nodes

updateNode/6 – loads the status of nodes and checks if node has been traversed (condition 1), node is in queue (condition 2), node about to be inserted (condition 3). After which updateNode\_operation is then performed to do the necessary operations such as (node to be deleted), or (node to be inserted).

generate/4 – prior loader predicate to load generatePath and to reverse the reading of the nodes (so that it’s in proper order)

generatePath/4 – generates the best path to travel from Source to Destination with the fastest time. Loads ogNode to get the starting parent.

Journey – journey predicate which takes in user input of form (S,D,M)

Examples of using the journey predicate:

journey(corkAirport, dublinAirport, fct).

journey(cork, corkAirport, fc).

journey(dublin, cork, fct).