**IT3160E INTRODUCTION TO ARTIFICIAL INTELLIGENCE**

**CAPSTONE PROJECT**

**Class: 131117**

**Lecturer: Than Quang Khoat**

1. **GROUP INFO**

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1. **PROBLEM DESCRIPTION**

Problem: Route Planning

*Overview*

We’re a writing a program to find the shortest route between two Vietnamese cities (e.g. Hanoi and Hai Phong). The intelligent vehicle can only travel between 2 adjacent cities, and the objective is to minimize the number of kms between two cities. We’ll generate ourselves a map of the northern side of Vietnam using <https://www.distantias.com/distance-calculator-vietnam.html>

*Input*

The cities list and distance list between cities will then be read from an excel file having the following format:



The starting city and ending city will be fixed randomly.

*Output*

The program will have several outputs:

* Time complexity (number of nodes expanded in order to solve the route planning problem)
* Space complexity (number of nodes kept in memory)
* The path used to solve the route planning problem (solution) if there was a solution
* The cumulated number of km of the solution (if any)

*Algorithms*

We’re planning to use Breadth first search, Greedy best first search and A\* search algorithm with the heuristic function h(n) = the estimated straight-line distance (flying distance) from n to the goal city.

There’ll also be deep analysis and comparison between the three algorithms and visualization for the solution.

*Applications*

Optimized Travelling, Delivery and many more.