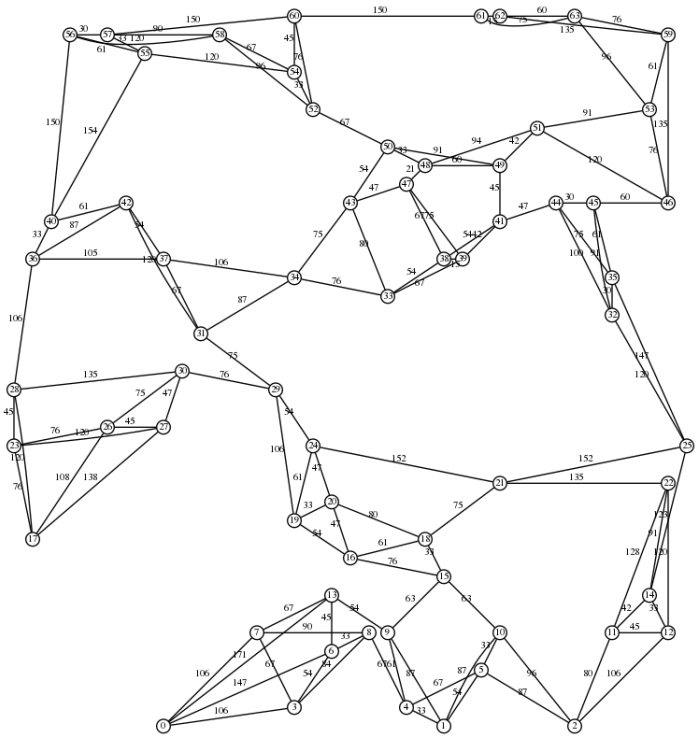
First Assignment
Computer Game AI
COMP09041

Issue Date: Tuesday, January 29th, 2019
Due Date: **5pm, Friday, February 22nd, 2019**

Pathfinding



Navigate a route through the weighted, undirected graph shown above. Start from node **0**, with node **60** as the goal. Assume the edge labels represent the actual travel costs, accounting for varied terrain. Use an appropriate algorithm

to determine the best path via consecutive connected nodes. Try to minimise the travel cost.

Algorithms

The A* algorithm is ideal for solving such a problem; as is IDA*. You are however free to use any algorithm you choose; though grades will follow ambition. Write a C/C++ program to calculate a good route between nodes **0** and **60**. Feel free to build upon the code supplied in the lab session of week #2.

Resources

You are supplied with a Graphviz-compatible "dot" file (random64_4_1485816605.dot) representing the problem. You can view the file using Notepad++. The following line from the file indicates that node **32** has position coordinates (525,330):

```
32[fontsize="8",pos="525,330"];
```

Meanwhile, this line indicates there is a connection between nodes **32** and **35**, with a weight of **30**:

```
32--35 [fontsize="8",label="30"];
```

You can either write your own parser, or use an existing "dot" parser. You may also simplify the file syntax to your taste; or even just transfer relevant numeric values directly into your C/C++ code. The `fontsize="8"` entries are only used to create the png file, and may be ignored. You may enhance your program by allowing the end user of your program to choose the start and end node themselves.

Submission

Your submission should include your source code, along with a simple text file (i.e. readme.txt) including your results; and explaining your choice of algorithm (or algorithms) in around 500 words. Do not submit binary files. You should work in pairs. You can share *ideas* between teams, but *do not share code*; plagiarism is handled formally by a specialist panel.

Marking Scheme

The assignment is worth 20% of the marks awarded for the entire COMP09041 module. The following provides a breakdown of the marking scheme for this assignment:

Explanation and choice of algorithm	40%
Quality and readabilty of code	30%
Written report	20%
Path result	10%