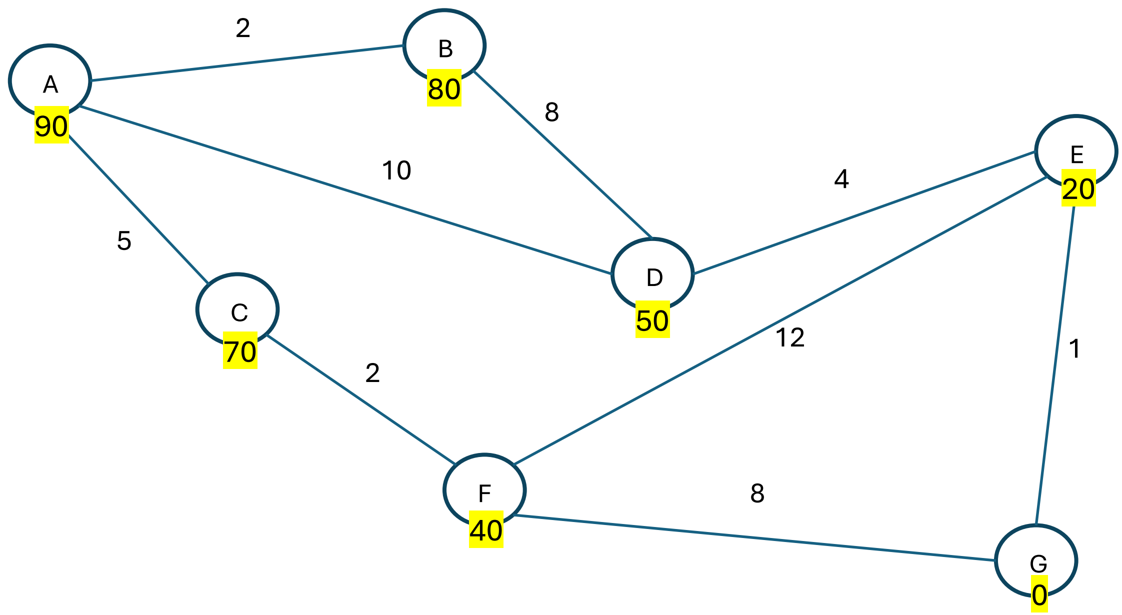
2.3.1 A* Algorithm Questions



1. The diagram above is of a weighted graph. Use the A* algorithm to find the shortest path from node A to G. You may use the table below to give your answer.

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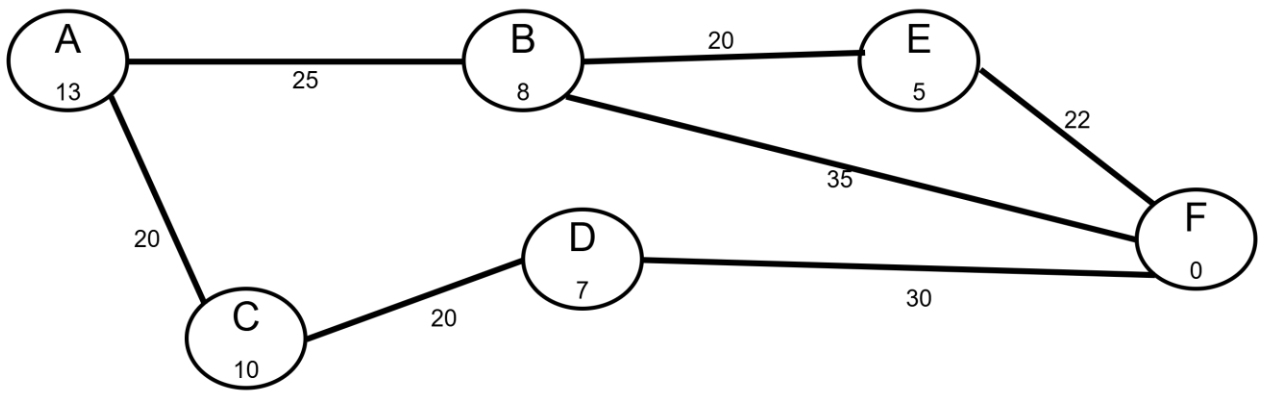
Node	Distance	Heuristic	Distance + Heuristic	Previous node

Final path = ____________________________________

Distance travelled = ______________________________

[7]

2.3.1 A* Algorithm Questions



2. The diagram above is of a weighted graph. Use the A* algorithm to find the shortest path from node A to F. You may use the table below to give your answer.

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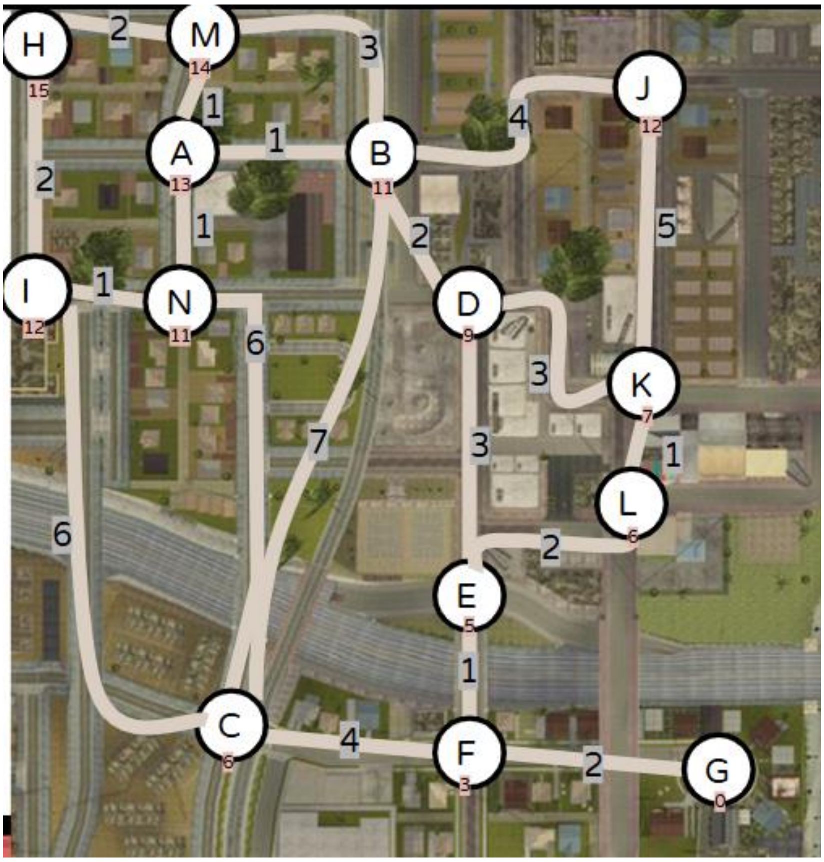
Node	Distance	Heuristic	Distance + Heuristic	Previous node

Final path = ______________________________

Distance travelled = ________________________

[7]

2.3.1 A* Algorithm Questions



Node	Distance	Heuristic	Distance + Heuristic	Previous node
A				
B				
C				
D				
E				
F				
H				
I				
J				
K				
L				
M				
N				
Grove St				

Final path = ______________________________

Distance travelled = ________________________

END OF QUESTION PAPER

2.3.1 A* Algorithm Questions

Mark scheme

<table>
<tr><th>Qs</th><th>Answer/Indicative content</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>1</td><td>1 mark for final path A-D-E
1 mark for final distance of 15
1 mark for each section working shown.
1 mark for showing that D as a possible path for B but crossed out
<table>
<tr><th>Node</th><th>D</th><th>H</th><th>D+H</th><th>Previous node</th><th>Marking Guidance</th></tr>
<tr><td>A</td><td>0</td><td>90</td><td>90</td><td>- / N/A / blank / None</td><td>1 Mark</td></tr>
<tr><td>B</td><td>2 ~~18~~</td><td>80</td><td>82 ~~98~~</td><td>A ~~B~~</td><td></td></tr>
<tr><td>C</td><td>5</td><td>70</td><td>75</td><td>A</td><td></td></tr>
<tr><td>D</td><td>10</td><td>50</td><td>60</td><td>A</td><td></td></tr>
<tr><td>E</td><td>14</td><td>20</td><td>34</td><td>D</td><td>1 Mark</td></tr>
<tr><td>F</td><td>26</td><td>40</td><td>46</td><td>E</td><td>**1 Mark**</td></tr>
<tr><td>G</td><td>15</td><td>0</td><td>15</td><td>E</td><td>1 Mark</td></tr>
</table></td><td>7</td><td></td></tr>
<tr><td>2</td><td>1 mark for final path A-B-F
1 mark for final distance of 60
1 mark for each section working shown.
<table>
<tr><th>Node</th><th>D</th><th>H</th><th>D+H</th><th>PN</th><th>Guidance</th></tr>
<tr><td>A</td><td>0</td><td>13</td><td>13</td><td>-</td><td>1 mark</td></tr>
<tr><td>B</td><td>25</td><td>8</td><td>33</td><td>A</td><td></td></tr>
<tr><td>C</td><td>20</td><td>10</td><td>30</td><td>A</td><td>1 mark</td></tr>
<tr><td>D</td><td>40</td><td>7</td><td>47</td><td>C</td><td>1 mark</td></tr>
<tr><td>E</td><td>45</td><td>5</td><td>50</td><td>B</td><td>1 mark</td></tr>
<tr><td>F</td><td>60 ~~65~~</td><td>0</td><td>60 ~~67~~</td><td>B ~~E~~</td><td>1 mark</td></tr>
</table></td><td>7</td><td></td></tr>
<tr><td>3</td><td>No Grading. Just for fun! Go to our YouTube channel to see the solution.</td><td></td><td></td></tr>
<tr><td></td><td>**Total**</td><td>**12**</td><td></td></tr>
</table>