<table>
<tr><th colspan="2">Question</th><th></th><th>Marks</th></tr>
<tr><td>1</td><td>1</td><td>All marks AO1 (understanding)

<table>
<tr><th></th><th>True or False?</th></tr>
<tr><td>Calculates the shortest path between a node and other nodes in a graph</td><td>True</td></tr>
<tr><td>Can be used to prove the Halting Problem cannot be solved</td><td>False</td></tr>
<tr><td>Can be used with both directed and undirected graphs</td><td>True</td></tr>
<tr><td>Can be used with both weighted and unweighted graphs</td><td>False</td></tr>
</table>

Mark as follows:

1 mark: three rows correct
2 marks: all rows correct.</td><td>2</td></tr>
<tr><td>1</td><td>2</td><td>Mark is for AO1 (knowledge)

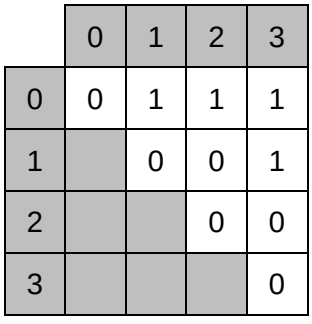
A subroutine that calls itself;</td><td>1</td></tr>
<tr><td>1</td><td>3</td><td>All marks AO2 (apply)

<table>
<tr><th><code>Count</code></th><th>Value returned</th></tr>
<tr><td><code>0</code></td><td></td></tr>
<tr><td><code>1</code></td><td><code>False</code></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>

Mark as follows:

1. Column for <code>Count</code> is correct I. repeated consecutive instances of values
I. blank cells
2. Value returned is <code>False</code>

Max 1 if any errors</td><td>2</td></tr>
</table>

1	**4**	**Mark is for AO2 (analyse)**  **A.** any suitable indicators used instead of 0 and 1 **A.** blank cell instead of 0 **R.** if usage inconsistent	**1**

1	5	**All marks AO2 (apply)**		6

			Visited				
Subroutine call	**V**	**P**	**[0]**	**[1]**	**[2]**	**[3]**	**N**
			False	False	False	False	
G(0, -1)	0	-1	True				1
G(1, 0)	1	0		True			0
							3
G(3, 1)	3	1				True	0
G(1, 0)							
G(0, -1)							
Final value returned:	True						

Mark as follows:

1. `Visited[0]` set to `True` and then not changed
2. `Visited[1]` set to `True` and then not changed, `Visited[3]` set to `True` and then not changed, `Visited[2]` always has value of `False`
3. Second subroutine call is `G(1, 0)` **I.** repeated consecutive instances of this call
4. Third and final subroutine call is `G(3, 1)` **I.** repeated consecutive instances of this call **I.** missing calls `G(1, 0)` and `G(0, -1)`
5. Value returned is `True`
6. `N` column contains correct values **A.** values of 3 in 2nd last cell for `N` and value of 1 in last cell for `N`, instead of the two blank cells

Max 5 if any errors

1	**6**	**Mark is for AO2 (analyse)** Determine if a graph contains a cycle or not;	**1**
1	**7**	**Mark is for AO2 (analyse)** Depth-first search;	**1**
1	**8**	**Mark is for AO2 (analyse)** The graph is a tree;	**1**