

**CIS 421 Artificial Intelligence**  
**Grading Assignment 6: Q-learning, Trolls and Ponies**

**Name:**

<b>Part 1</b>	Unsatisfactory	Satisfactory	Very Good	
<b>Code structure, format, and style</b>  10 points	<ul style="list-style-type: none"> <li>Code lacks good design (lacks modularity, poor use of variables/data structures, use of global variables)</li> <li>Inadequate comments</li> <li>No ID block</li> <li>Code is poorly formatted (bad indentation, text wrapping)</li> <li>Identifiers are not self-documenting</li> </ul> 0-5 points	Some lesser violations as described under Unsatisfactory.     6-9 points	Code is well designed, well formatted, and has adequate comments.     10 points	/10
<b>Visualization</b>  17 points	<ul style="list-style-type: none"> <li>World is not configured correctly</li> <li>Elements are not placed correctly</li> <li>Burglar position is not randomly generated</li> </ul> 0-7 points	<ul style="list-style-type: none"> <li>Lesser issues from among Unsatisfactory.</li> </ul> 8-16 points	Visualization is complete and correct     17 points	/17
<b>Environment dynamics</b>  18 points	<ul style="list-style-type: none"> <li>Burglar does not move</li> <li>Movement rules are incorrect</li> <li>Rewards are not part of the environment</li> </ul> 0 – 9 points	<ul style="list-style-type: none"> <li>Lesser issues from among Unsatisfactory</li> </ul> 10-17 points	Dynamics are correct     18 points	/18
<b>Part 1 Total</b>				/45

<b>Part 2</b>	Unsatisfactory	Satisfactory	Very Good	
<b>Variation 1: basic Q-learning and code design and style</b>  25 points	<ul style="list-style-type: none"> <li>Code lacks good design (lacks modularity, poor use of variables/data structures, use of global variables)</li> <li>Code lacks good formatting</li> <li>Agent does not perform well</li> <li>Program does not accommodate different environment files</li> </ul> 0-15 points	Some lesser violations as described under Unsatisfactory.     16-24 points	Code is well designed, well formatted; Q-learning is correctly implemented.     25 points	/25

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<b>Variation 2: different learning rates and discount factors</b>  10 points	<ul style="list-style-type: none"> <li>• Program does not accomodate different learning rates or discount factions</li> <li>• Not all results are reported</li> </ul> 0-4 points	<ul style="list-style-type: none"> <li>• Lesser issues from among Unsatisfactory.</li> </ul> 5-9 points	Different rates are correctly implemented  10 points	/10
<b>Variation 3: variable learning rate</b>  10 points	<ul style="list-style-type: none"> <li>• Program does not implement learning rate as some function of how often a state is visited</li> </ul> 0-4 points	<ul style="list-style-type: none"> <li>• Lesser issues from among Unsatisfactory</li> </ul> 5-9 points	Variable learning rate is correctly implemented  10 points	/10
<b>Discussion</b> 10 points	<ul style="list-style-type: none"> <li>• Missing or incomplete</li> </ul> 0-4 points	<ul style="list-style-type: none"> <li>• Lesser issues from among Unsatisfactory</li> </ul> 5-9 points	Included a discussion as described in handout  10 points	/10
<b>Extra credit: moving trolls</b>  10 points	<ul style="list-style-type: none"> <li>• Troll movement is not random</li> <li>• Environment does not update properly when trolls move</li> </ul> 0-4 points	<ul style="list-style-type: none"> <li>• Lesser issues from among Unsatisfactory</li> </ul> 5-9 points	Trolls move correctly  10 points	/10
<b>Part 2 Total</b>				/55

**Overall Total: /100**