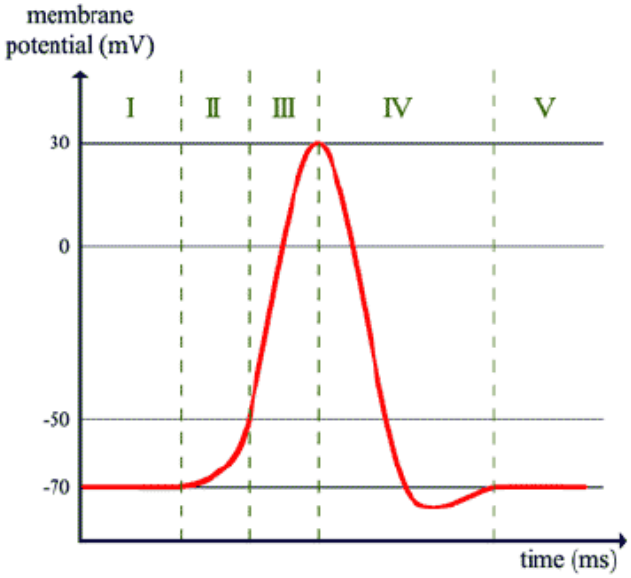
CS786 Quiz 1

Q1. **Neuron electrochemistry (25 points)**

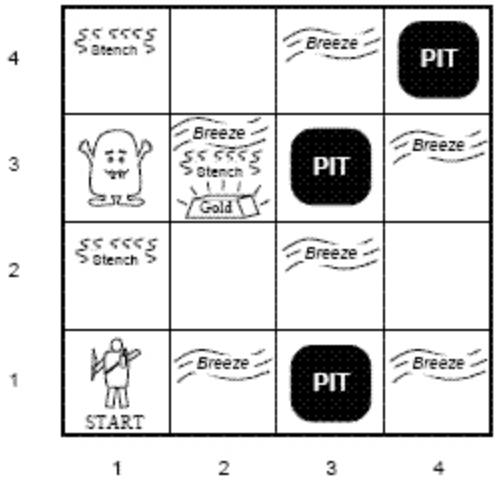


4. What is David Redish's explanation for cocaine addiction? What facets of addiction does this explanation cover? How does this explanation differentiate between addiction and habituation? **(10 points)**

Q2. **Association(25 points)**

Kamin blocking is a classic conditioning experiment wherein a dog (say) is conditioned with food in the presence of a light first, then with food in the presence of both the light and a sound. On testing, it turns out that the dog fails to respond when tested with just the sound. Can the Rescorla-Wagner model predict this effect? Assume a maximum association strength of 100, a attention and salience parameters of 0.8 each, and sketch out a quantitative explanation for why the model does (or doesn't) explain the effect. (20 marks)

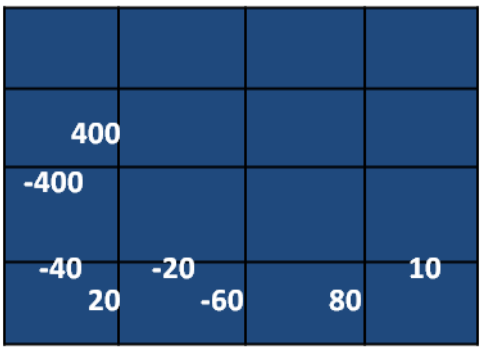
Q4. **Reinforcement (25 points)** See the diagram of wumpus world overleaf and answer the corresponding questions.



Wumpus world is a classic toy world from Russell & Norvig's AI book. In this question, we want to examine how (a) a Q-learner and (b) a SARSA-based agent, would fare if set loose in Wumpus world. The scoring rules are:

1. falling into a pit gives -100 points
2. encountering the wumpus gives -500 points
3. finding the gold gives +1000 points
4. encountering the stench of the wumpus gives -50 points
5. encountering a breeze gives -10 points

Let's say we always start from the cell marked START, and each episode terminates either once you find the gold, or have made 5 moves, can you sketch out a representative episode each for the Q-learner and the SARSA-based agent? Assume that your current knowledge of Q is represented by the diagram below.



*Notation: numbers are placed close to one of the four box boundaries of each box. The number denotes Q(**s**,**a**), where **s** is the box where the number is located, and **a** is the action that leads from **s** to the box that is adjacent to **s** along the boundary of **s** that is closest to the number. No number present means this particular state-action pair has not been observed yet by the agent.*