

## **PSYCO 354 Quiz 4**

**Define the term 'linearly separable problem'. Why is this concept important to connectionist cognitive science?**

**Name:**

**ID #:**

**A linearly separable problem is a pattern classification problem that can be solved by making a single straight cut through a pattern space (see Figure 4-2A in the text). This cut separates all of the input patterns that belong to the class from all of the input patterns that do not belong to the class; any pattern is represented as a single point in the pattern space.**

**Linearly separable problems are of importance to connectionist cognitive science because these problems are particularly easy, and therefore very simple networks – networks like perceptrons that do not have hidden units – can learn to solve them. However, many psychologically interesting problems are more complex, and are not linearly separable. Connectionists strove to develop new, more powerful, architectures to show that artificial neural networks could do more than merely solve linearly separable problems. This led to the discovery of modern techniques for training networks that include hidden units, and which are capable of solving linearly nonseparable categorization problems.**