

**MA477: Data Science**  
**Lesson 14 Board Sheet — 12 February 2026**  
United States Military Academy, West Point  
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## 1 Linear Discriminate Analysis Lesson Objectives

- Understand separating hyperplanes and the maximum margin classifier.
- Understand the details of the support vector classifier (ISLP equations 9.12-9.15).
- Use sklearn modules to assess support vector machine (SVM) classifiers.

### Discussion Questions

We will organize this lecture around the following five questions:

1. Define and describe a hyperplane in two dimensional space?
2. How Can a Hyperplane Be Used for Classification?assumptions important?
3. If Many Separating Hyperplanes Exist, Which One Should We Choose?
4. How Do We Express the Margin Mathematically?
5. What Is the Maximal Margin Optimization Problem?