I. The Geometry of Vectors
   A. Vectors are directed line segments
   B. Vector addition
   C. Scalar multiplication of a vector (generating a subspace)
   D. Vector subtraction
   E. Scalar product of two vectors

II. Vector Representation of Data
   A. Traditionally, observation points (or vectors) in variable space
   B. Instead, show variable vectors within observation space
   C. For convenience, assume that variables are centered, so means are all zero

III. Vectors and Simple Statistics
   A. Squared vector length is sum-of-squares for variable
   B. Cosine of angle between two vectors is the correlation

IV. Vectors and Regression Analysis
   A. Regression is the perpendicular projection from the tip of the Y vector into the subspace
      defined by X
   B. Vectors enable derivation of the OLS coefficient without calculus
   C. The analysis of variance for regression is depicted by a triangle of three vectors
   D. The vector representation generalizes to multiple regression. It remains the perpendicular
      projection from the tip of the dependent variable into a subspace spanned by the
      independent variable vectors

V. Insights from the Vector Representation
   A. Collinearity and the problem of partitioning explained variance
   B. Degrees of freedom and the dimensionality of subspaces