Day/Topic	Description
1. Introduction	Course introduction: What is machine learning? How can model accuracy be assessed? Course introduction and basic concepts of machine learning. Introduction to RStudio.
2. Linear regression	Quick one lecture refresher on linear regression and compare it to KNN.
3. Classification	We will see simple approaches to classification problems and compare them. Specifically, we will look at linear discriminant analysis, k nearest neighbor, and logit models.
4. Resampling	How good are our prediction models? Cross-validation provides an optimal approach to assess model quality. We will focus specifically on *k*-fold cross-validation. This is a cornerstone of most statistical learning approaches. We will also cover bootstrapping.
5. Model selection I	Model selection 1: When facing many potential explanatory factors we need to choose the "right" combination. This day will cover "best subset selection" which allows us to identify the optimal set of predictors. We will see different implementations (forward, backward).
6. Model selection II	Model selection 2: Beyond best subset selection we also have additional tools at our disposal. Lasso regression provides a flexible approach to deal with many potential explanatory variables. Ridge is Lasso's brother – both rely regularization but use different forms.
7. Polynomial models	Moving beyond linearity: Polynomial functions add a great deal of flexibility and we will see how we can combine these models with the various techniques from the first six days.
8. Tree-Based Methods	Prediction can also be based on non-standard models such as regression trees. We will see how to use regression trees and how we combine several regression trees into one prediction to boost predictive accuracy.
9. Unsupervised Learning	Unsupervised learning: A prominent tool within unsupervised learning techniques is principle component analysis. It is an easy way to reduce the dimensionality of the parameter space.

10. Final project	“Bringing it all together”: We will spend our last day on how to work through an applied example and how to combine the various elements successfully. Participants are encouraged to bring their own projects. Titanic & Referendum outcomes