In this talk, we present our analysis of Birds of a Feather (BoaF), a recently-invented perfect-information solitaire card game that was the subject of an undergraduate research challenge for an international conference in Artificial Intelligence. While the large majority of BoaF deals are solvable, the set of unsolvable deals share certain characteristics that can be determined from the adjacency matrix of the corresponding "compatibility graph". We create a binary decision tree based on just three variables to predict whether a given deal is solvable. Our predictive model, tested on 30,000 random deals, correctly classifies over 99.9% of our data.