This project investigates the prospect of utilizing hidden Markov models (HMMs) to perform anomaly detection on large datasets. Hidden Markov models are statistical models in which the system in question is considered to be a Markov process. After standardizing the data, the project’s methodology was comprised of three major tasks in relation to building and training hidden Markov models (implemented using R), and using them to detect anomalies in a given dataset: feature engineering, building a hidden Markov model, and interpreting the results for the purpose of anomaly detection. Through principal component analysis (PCA), it was determined that the features global active power and global intensity were optimal for model training. Using the model, the degree of anomalies present in the data was determined by computing the log-likelihood for each observation sequence found in the data. The expectation was that a hidden Markov model would perform adequately at minimum, given the current extensive application of Markov models to similar statistical problems. These expectations were met accordingly, with the model facilitating anomaly detection in all three of the datasets.