The aim of this thesis is to train a computer on Beatles' songs using the research project Magenta from the Google Brain Team to produce its own music, to derive backpropagation formulas for recurrent neural networks with LSTM cells used in the Magenta music composing model, to overview machine learning techniques and discuss its similarities with methods of mathematical statistics. In order to explore the qualities of the artificially composed music more thoroughly, we restrict ourselves to monophonic melodies only. We train three deep learning models with three different configurations (Basic, Lookback, and Attention) and compare generated results. Even though the artificially composed music is not as interesting as the original Beatles, it is quite likeable. According to our analysis based on musically informed metrics, artificial melodies differ from the original ones especially in lengths of notes and in pitch differences between consecutive notes. The artificially composed melodies tend to use shorter notes and higher pitch differences.