1. a clear statement of the design, creative, or business issue that the student is attempting to tackle through an original work; (b) background on the artistic genre or technological area in which the student is attempting to make a contribution (i.e. what has been done in this area of creative arts or technological design in the past and how this frames the student’s approach); (c) discussion of how the design, technological, business, or artistic product was conceived; (d) presentation of the results; and (e) an evaluation of its contribution to the discipline.

The purpose of this document is to provide a thorough description of the architecture implemented in my Capstone research project. The objective of the project was to automate melody generation. This can be seen as addressing the business need of sourcing an expert for the task of musical composition. This objective was achieved by gathering a corpus of midi files from which melodies were extracted, with some natural heuristics being used to predict which tracks contained in the songs can rightfully be considered melodies. These melodies were then rhythmically quantized to 1/32nd note granularity. They were then used to formulate a state-action space from which trajectories can be sampled.

Each state corresponds to a 1/32nd beat time slice of a melody and is described by a tuple, with the first element of the tuple being a feature vector and the second element a set of actions. The features used to define the states were 104 bit binary vectors. The first 12 bits correspond to an indicator function denoting the relative distance of the event producing the current state from the songs current most frequently occurring pitch (referred to from here on out as the songs pitch mode.)

In order to fully specify a feature, the currently held pitch, the direction of each of the previous eight events in the song, the most frequently occurring pitch in the song thus far, the most frequently occurring pitch in the current measure thus far and the absolute beat within the song must all be known. This data is maintained during the runtime of the program in an object called the SongContext

