**2.2.1. Aims**

According to the proposal given by the project tutors, the main goal is to develop 4 or more new robot instruments that will be controlled by a conductor. This should form a new standalone robot orchestra that can play at least 2 or more songs or melodies, but should be flexible and allow for new additions of songs or instruments in the future. As the title implies, this is a robot orchestra and it should operate at a high level of autonomy.

The orchestra should stick to a certain engineering aesthetic as it is meant to promote STEM aspects and to appeal to audiences that are not traditionally associated with engineering.

Other goals outlined by the proposal are to make sure the orchestra is easily transportable in order to take it to different places and events.

**2.2.2. Objectives**

After each member of the team got their general roles the following objectives were set:

1. Select four new instruments:

* Look at different songs that could incorporate 4 robot instruments using Anvil Studio which looks at the MIDI file break down.
* Pick two songs as well as the 4 instruments that will be playing those songs.

1. Design and construct the four instruments:

* Propose designs for the instruments as well as ideas for their communication with the conductor while considering transportation and modularity.
* Use CAD to design hardware and then produce prototypes.
* Design and test breadboard circuits and convert to PCBs.
* Print the PCBs make sure they work with the software like the breadboard circuits.
* Construct the hardware.
* Test the instruments and make sure they play all the notes that Anvil Studio shows they need to play and at the right tempo.

1. Design a conductor:

* Decide on an embedded system for the conductor.
* Design the conductor which will communicate with the instruments.
* Communicate with each instrument using the conductor.
* Receive “Play” and “Stop” from the GUI and send those commands to the instruments.

1. Synchronise the 4 instruments to play coherent music.