**Digital Musical Trigger Gloves.**

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Assignment 1 – Portfolio.

**Construction of coding for digital gloves.**

When deciding the right programming language to use for the coding, C# was chosen, as it is an easy environment to program and visualise in, and also has access to a variety of audio libraries in order to make the notes activate.

A form was created with a visualisation of the left and right hands, and buttons were created to replicate the triggers, placed in the correct visual place, as they would be on each hand.

True and false information was used to determine whether a trigger on a finger/thumb was depressed or not. From having true/false (on/off) information on the left hand triggers, this set the parameters for the notes chosen by the right hand. Information to determine note off was also used in the right hand to make the note stop after the trigger had been released. Initially, this was tested using the computer keyboard to replicate the triggers on the fingers, (left hand triggers were replicated as keys Q, W, E, R, C, X and Z, right hand triggers were replicated using keys U, I, O, P, N and M, )but there is a limit on how many keys can be depressed simultaneously in order to create the more complex note calculations. This is commonly known as ‘rollover’. The coding would be correct to make the notes happen when applied to the actual gloves, but the keyboard was useful to test the theory of the coding as it was created.

Initial coding used information given for each musical key (A, A minor, Bb, Bb minor, etc), but it was then decided that an overall calculation might be a better option, rather than telling each right hand function individually. There were quite a few bugs appearing in initial coding, either through the program not having the capability to do what was required, or an event was needed to make something happen that was not expected. Once notes had been triggered, it was problematic to make the notes stop once a trigger had been released. This problem was easily overcome when the coding for the right hand related to each individual musical key, as note stop information was given for each note start command. Once an overall calculation was used, it was more problematic to get an individual note to stop once the trigger had been released, but an overall note off command was constructed, relating to both right and left hand triggers. (If there was no left hand information, nothing could be played in the right hand, but also if a right hand trigger was released, the note should also stop).

To hear the notes being created, midi.net library was used, which assigns a number to each note. These numbers correspond with the generally used midi note numbering system that uses A4 at 440Hz as number 69. A0 starts at number 21. A basic piano sound was used for testing, but once operative, any other available midi sound could be used.