**IoT Project Proposal Year 1 Semester 2**

**Name:** Jack Power

**Student No.:** 20080169

**Project Title:** Automatic Guitar Tuner.

**Purpose:** A sensor will detect the pitch of the string to be tuned and a motor will adjust the tension until the string is in tune. This allows the user to tune to a range of tunings with ease.

**Customer Feature List:**

1. Select desired pitch with buttons.
2. LCD screen displays desired note and current pitch.

**Context Diagram:**

Compare Hz

tensionAdjustment

currentPitch

selection

Convert to Hz

screenFeedback

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Direction** | **Type** | **Description** |
| currentPitch | Input | Analogue | Current pitch of string in Hertz. |
| selection | Input | Digital | Target pitch to be tuned to as note, converted to Hertz.  Selected by the user to be the desired note. |
| tensionAdjustment | Output | Analogue | Motor turns machine head to adjust tension. |
| screenFeedback | Output | Visual Information | Information is communicated to the user through a screen. |

**Non-Functional Requirements:**

* The string vibrates audibly for about 2 seconds, the tuner must be able to make multiple analyses of the pitch every time it is plucked to reach the target selection. This means that the pitch analysis cannot take more than 0.2 secs.
* The required torque to drive the gearing of the machine head is smaller than 0.05Nm.
* System must be constructed and mounted to be able to read pitch and then turn any machine head on the instrument.