Olas Ortwein
SWDV Capstone
Database Write-Up
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Database Design

For the course of this project, the ChordScale App will Utilize a Document Database Design (MongoDB) to persist the data necessary for the app's function. Due to the musical nature of the app, a relational database would become cumbersome and convoluted. Relational Tables could work for a portion of the app's function; however, the necessity of specific audio and the complexity of the ChordScale Algorithm that processes the data makes MongoDB the better choice for this app. The Database will store the JSON "keyDict" Dictionary that gives the app it's flexibility and robustness - the data that the app will process to deliver the user the proper information. These nested-dictionaries within ChordScale.keyDict contain all possible note choices dependent on the Root of the chord:

```
1    {
2      "C": {
3        "1": "C",
4        "b2": "C SHarp/Db",
5        "2": "D",
6        "b3": "Eb",
7        "3": "E",
8        "4": "F",
9        "b5": "F Sharp/Gb",
10       "5": "G",
11       "b6": "Ab/G Sharp",
12       "6": "A",
13       "b7": "Bb",
14       "7": "B"
15     },
16     "C Sharp": {
17       "1": "C Sharp",
18       "b2": "D",
19       "2": "D Sharp",
20       "b3": "E",
21       "3": "E Sharp/F",
22       "4": "F Sharp",
23       "b5": "G",
24       "5": "G Sharp",
25       "b6": "A",
26       "6": "A Sharp",
27       "b7": "B",
28       "7": "B Sharp/C"
29     },
```

```
30     "Db": {
31       "1": "Db",
32       "b2": "D",
33       "2": "Eb",
34       "b3": "E",
35       "3": "F",
36       "4": "Gb",
37       "b5": "G",
38       "5": "Ab",
39       "b6": "A",
40       "6": "Bb",
41       "b7": "Cb/B",
42       "7": "C"
43     },
44     "D": {
45       "1": "D",
46       "b2": "Eb",
47       "2": "E",
48       "b3": "F",
49       "3": "F Sharp",
50       "4": "G",
51       "b5": "Ab/G Sharp",
52       "5": "A",
53       "b6": "Bb",
54       "6": "B",
55       "b7": "C",
56       "7": "C Sharp"
57     },
```

```
58     "Eb": {
59       "1": "Eb",
60       "b2": "E",
61       "2": "F",
62       "b3": "Gb",
63       "3": "G",
64       "4": "Ab",
65       "b5": "A",
66       "5": "Bb",
67       "b6": "Cb/B",
68       "6": "C",
69       "b7": "Db",
70       "7": "D"
71     },
72     "E": {
73       "1": "E",
74       "b2": "F",
75       "2": "F Sharp",
76       "b3": "G",
77       "3": "G Sharp",
78       "4": "A",
79       "b5": "Bb",
80       "5": "B",
81       "b6": "C",
82       "6": "C Sharp",
83       "b7": "D",
84       "7": "D Sharp"
85     },
```

keyDict Continued:

```
 86    "F": {                        114    "Gb": {                       142    "Ab": {                       170    "Bb": {
 87        "1": "F",                 115        "1": "Gb",                143        "1": "Ab",                171        "1": "Bb",
 88        "b2": "Gb",               116        "b2": "G",                144        "b2": "A",                172        "b2": "B",
 89        "2": "G",                 117        "2": "Ab",                145        "2": "Bb",                173        "2": "C",
 90        "b3": "Ab",               118        "b3": "A",                146        "b3": "B",                174        "b3": "Db",
 91        "3": "A",                 119        "3": "Bb",                147        "3": "C",                 175        "3": "D",
 92        "4": "Bb",                120        "4": "Cb/B",              148        "4": "Db",                176        "4": "Eb",
 93        "b5": "B",                121        "b5": "C",                149        "b5": "D",                177        "b5": "E",
 94        "5": "C",                 122        "5": "Db",                150        "5": "Eb",                178        "5": "F",
 95        "b6": "Db",               123        "b6": "D",                151        "b6": "E",                179        "b6": "Gb/F Sharp",
 96        "6": "D",                 124        "6": "Eb",                152        "6": "F",                 180        "6": "G",
 97        "b7": "Eb",               125        "b7": "E",                153        "b7": "Gb",               181        "b7": "Ab",
 98        "7": "E"                  126        "7": "F"                  154        "7": "G"                  182        "7": "A"
 99    },                            127    },                            155    },                            183    },
100    "F Sharp": {                  128    "G": {                        156    "A": {                        184    "B": {
101        "1": "F Sharp",           129        "1": "G",                 157        "1": "A",                 185        "1": "B",
102        "b2": "G",                130        "b2": "Ab",               158        "b2": "Bb",               186        "b2": "C",
103        "2": "G Sharp",           131        "2": "A",                 159        "2": "B",                 187        "2": "C Sharp",
104        "b3": "A",                132        "b3": "Bb",               160        "b3": "C",                188        "b3": "D",
105        "3": "A#",                133        "3": "B",                 161        "3": "C Sharp",           189        "3": "D Sharp",
106        "4": "B",                 134        "4": "C",                 162        "4": "D",                 190        "4": "E",
107        "b5": "C",                135        "b5": "C Sharp/Db",       163        "b5": "Eb/D Sharp",       191        "b5": "F",
108        "5": "C Sharp",           136        "5": "D",                 164        "5": "E",                 192        "5": "F Sharp",
109        "b6": "D",                137        "b6": "Eb/D#",            165        "b6": "F",                193        "b6": "G",
110        "6": "D Sharp",           138        "6": "E",                 166        "6": "F Sharp",           194        "6": "G Sharp",
111        "b7": "E",                139        "b7": "F",                167        "b7": "G",                195        "b7": "A",
112        "7": "E Sharp/F"          140        "7": "F#"                 168        "7": "G Sharp"            196        "7": "A Sharp"
113    },                            141    },                            169    },                            197    }
                                                                                                               198 }
```

Due to time constraints, the mp3s will have to be embedded within the app in an assets folder - in lieu of the original plan to store the >1MB mp3s as BSON data. Instead, I will create a collection within the ChordScale database that contains the names and file-paths of every type of mp3 that will be utilized:

```
 1   {
 2         //Unique ID
 3         _id: (ObjectID),
 4
 5         //Scale, Chord, Chord Tone, Extention, or Note-to-Avoid
 6         "name": (String),
 7
 8         //Specific mp3 Path
 9         "path": (String)
10   }
```

All 350 mp3s that are needed for the app will be listed in the ChordScale.mp3s Collection in the database. Every MP3 name is specifically formatted with the same syntax in order to work with the ChordScale Algorithm and keyDict JSON Dictionary.