
# *µ*Project #5 "A Joyful Noise"

Due Tuesday 3/4

**HCI-833 Applied Gadgets, Sensors and Activity Recognition in HCI**
**Spring 2014**

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**Purpose**
This *µ*project explores the use of a speaker to produce simple sound output.

**What to Build**
Build a device which plays three or more tones on a speaker. If you wish to play a short tune, the frequency and period table on the back may be helpful.

**Turning the Assignment In and Grading**
This assignment is turned in by having one of your classmates certify completion and turn in a "peer demo" sheet signed by them. This project is pass/fail. *µ*Projects will be accepted without late penalty until Monday March 31st (after which a 10% per day late penalty will be applied).

| Note | Frequency (Hz) | Period (usec) | 1/2 period | Note | Frequency (Hz) | Period (usec) | 1/2 period | Note | Frequency (Hz) | Period (usec) | 1/2 period |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $C_0$ | 16.35 | 61162 | 30581 | $C_3$ | 130.81 | 7645 | 3822 | $C_6$ | 1046.5 | 956 | 478 |
| $C^{\#}_0/D^{b}_0$ | 17.32 | 57737 | 28868 | $C^{\#}_3/D^{b}_3$ | 138.59 | 7216 | 3608 | $C^{\#}_6/D^{b}_6$ | 1108.73 | 902 | 451 |
| $D_0$ | 18.35 | 54496 | 27248 | $D_3$ | 146.83 | 6811 | 3405 | $D_6$ | 1174.66 | 851 | 426 |
| $D^{\#}_0/E^{b}_0$ | 19.45 | 51414 | 25707 | $D^{\#}_3/E^{b}_3$ | 155.56 | 6428 | 3214 | $D^{\#}_6/E^{b}_6$ | 1244.51 | 804 | 402 |
| $E_0$ | 20.6 | 48544 | 24272 | $E_3$ | 164.81 | 6068 | 3034 | $E_6$ | 1318.51 | 758 | 379 |
| $F_0$ | 21.83 | 45809 | 22904 | $F_3$ | 174.61 | 5727 | 2864 | $F_6$ | 1396.91 | 716 | 358 |
| $F^{\#}_0/G^{b}_0$ | 23.12 | 43253 | 21626 | $F^{\#}_3/G^{b}_3$ | 185 | 5405 | 2703 | $F^{\#}_6/G^{b}_6$ | 1479.98 | 676 | 338 |
| $G_0$ | 24.5 | 40816 | 20408 | $G_3$ | 196 | 5102 | 2551 | $G_6$ | 1567.98 | 638 | 319 |
| $G^{\#}_0/A^{b}_0$ | 25.96 | 38521 | 19260 | $G^{\#}_3/A^{b}_3$ | 207.65 | 4816 | 2408 | $G^{\#}_6/A^{b}_6$ | 1661.22 | 602 | 301 |
| $A_0$ | 27.5 | 36364 | 18182 | $A_3$ | 220 | 4545 | 2273 | $A_6$ | 1760 | 568 | 284 |
| $A^{\#}_0/B^{b}_0$ | 29.14 | 34317 | 17159 | $A^{\#}_3/B^{b}_3$ | 233.08 | 4290 | 2145 | $A^{\#}_6/B^{b}_6$ | 1864.66 | 536 | 268 |
| $B_0$ | 30.87 | 32394 | 16197 | $B_3$ | 246.94 | 4050 | 2025 | $B_6$ | 1975.53 | 506 | 253 |
| $C_1$ | 32.7 | 30581 | 15291 | $C_4$ | 261.63 | 3822 | 1911 | $C_7$ | 2093 | 478 | 239 |
| $C^{\#}_1/D^{b}_1$ | 34.65 | 28860 | 14430 | $C^{\#}_4/D^{b}_4$ | 277.18 | 3608 | 1804 | $C^{\#}_7/D^{b}_7$ | 2217.46 | 451 | 225 |
| $D_1$ | 36.71 | 27241 | 13620 | $D_4$ | 293.66 | 3405 | 1703 | $D_7$ | 2349.32 | 426 | 213 |
| $D^{\#}_1/E^{b}_1$ | 38.89 | 25714 | 12857 | $D^{\#}_4/E^{b}_4$ | 311.13 | 3214 | 1607 | $D^{\#}_7/E^{b}_7$ | 2489.02 | 402 | 201 |
| $E_1$ | 41.2 | 24272 | 12136 | $E_4$ | 329.63 | 3034 | 1517 | $E_7$ | 2637.02 | 379 | 190 |
| $F_1$ | 43.65 | 22910 | 11455 | $F_4$ | 349.23 | 2863 | 1432 | $F_7$ | 2793.83 | 358 | 179 |
| $F^{\#}_1/G^{b}_1$ | 46.25 | 21622 | 10811 | $F^{\#}_4/G^{b}_4$ | 369.99 | 2703 | 1351 | $F^{\#}_7/G^{b}_7$ | 2959.96 | 338 | 169 |
| $G_1$ | 49 | 20408 | 10204 | $G_4$ | 392 | 2551 | 1276 | $G_7$ | 3135.96 | 319 | 159 |
| $G^{\#}_1/A^{b}_1$ | 51.91 | 19264 | 9632 | $G^{\#}_4/A^{b}_4$ | 415.3 | 2408 | 1204 | $G^{\#}_7/A^{b}_7$ | 3322.44 | 301 | 150 |
| $A_1$ | 55 | 18182 | 9091 | $A_4$ | 440 | 2273 | 1136 | $A_7$ | 3520 | 284 | 142 |
| $A^{\#}_1/B^{b}_1$ | 58.27 | 17161 | 8581 | $A^{\#}_4/B^{b}_4$ | 466.16 | 2145 | 1073 | $A^{\#}_7/B^{b}_7$ | 3729.31 | 268 | 134 |
| $B_1$ | 61.74 | 16197 | 8098 | $B_4$ | 493.88 | 2025 | 1012 | $B_7$ | 3951.07 | 253 | 127 |
| $C_2$ | 65.41 | 15288 | 7644 | $C_5$ | 523.25 | 1911 | 956 | $C_8$ | 4186.01 | 239 | 119 |
| $C^{\#}_2/D^{b}_2$ | 69.3 | 14430 | 7215 | $C^{\#}_5/D^{b}_5$ | 554.37 | 1804 | 902 | $C^{\#}_8/D^{b}_8$ | 4434.92 | 225 | 113 |
| $D_2$ | 73.42 | 13620 | 6810 | $D_5$ | 587.33 | 1703 | 851 | $D_8$ | 4698.64 | 213 | 106 |
| $D^{\#}_2/E^{b}_2$ | 77.78 | 12857 | 6428 | $D^{\#}_5/E^{b}_5$ | 622.25 | 1607 | 804 | $D^{\#}_8/E^{b}_8$ | 4978.03 | 201 | 100 |
| $E_2$ | 82.41 | 12134 | 6067 | $E_5$ | 659.26 | 1517 | 758 | | | | |
| $F_2$ | 87.31 | 11453 | 5727 | $F_5$ | 698.46 | 1432 | 716 | | | | |
| $F^{\#}_2/G^{b}_2$ | 92.5 | 10811 | 5405 | $F^{\#}_5/G^{b}_5$ | 739.99 | 1351 | 676 | | | | |
| $G_2$ | 98 | 10204 | 5102 | $G_5$ | 783.99 | 1276 | 638 | | | | |
| $G^{\#}_2/A^{b}_2$ | 103.83 | 9631 | 4816 | $G^{\#}_5/A^{b}_5$ | 830.61 | 1204 | 602 | | | | |
| $A_2$ | 110 | 9091 | 4545 | $A_5$ | 880 | 1136 | 568 | | | | |
| $A^{\#}_2/B^{b}_2$ | 116.54 | 8581 | 4290 | $A^{\#}_5/B^{b}_5$ | 932.33 | 1073 | 536 | | | | |
| $B_2$ | 123.47 | 8099 | 4050 | $B_5$ | 987.77 | 1012 | 506 | | | | |