**SUPPLEMENTARY MATERIAL**

**Table 1s:** Absolute and relative frequency of every notes for soprano roles

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Albigaille** | **Elvira** | **Lady** | **Gilda** | **Leonora1** | **Violetta** | **Elena** | **Maria** | **Amelia** | **Oscar** | **Leonora2** | **Elisabetta** | **Aida** | **Desdemona** | **Alice** | **Nannetta** |
| **C#6** | 0  (0) | 0  (0) | 1 (0.03) | 1 (0.04) | 1  (0.03) | 4  (0.08) | 1 (0.02) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **C6** | 5  (0.19) | 13 (0.43) | 6 (0.19) | 4 (0.14) | 8  (0.21) | 18 (0.36) | 7 (0.15) | 2 (0.09) | 4  (0.14) | 4 (0.21) | 0  (0) | 0  (0) | 4  (0.15) | 0  (0) | 2  (0.08) | 1  (0.07) |
| **B5** | 8  (0.30) | 14 (0.47) | 20 (0.62) | 10 (0.36) | 0  (0) | 1  (0.02) | 24  (0.50) | 3 (0.14) | 6  (0.21) | 4 (0.21) | 11  (0.42) | 4  (0.13) | 6  (0.22) | 3  (0.14) | 7  (0.27) | 3  (0.21) |
| **Bb5** | 17  (0.65) | 49 (1.63) | 31 (0.96) | 55 (1.97) | 53  (1.37) | 44 (0.89) | 23 (0.48) | 20 (0.90) | 43 (1.54) | 20  (1.03) | 13  (0.49) | 22  (0.71) | 33  (1.21) | 15  (0.70) | 2  (0.08) | 3  (0.21) |
| **A5** | 45  (1.71) | 86 (2.86) | 44 (1.36) | 37 (1.32) | 34  (0.88) | 58 (1.17) | 98 (2.03) | 21 (0.95) | 65 (2.32) | 38  (1.95) | 21  (0.80) | 24  (0.77) | 43  (1.57) | 11  (0.51) | 20  (0.77) | 18  (1.24) |
| **G#5** | 57  (2.16) | 35 (1.16) | 115 (3.57) | 108 (3.87) | 77  (1.99) | 82 (1.66) | 93 (1.93) | 35 (1.58) | 56  (2) | 36  (1.85) | 32  (1.21) | 45  (1.44) | 43  (1.57) | 23  (1.07) | 13  (0.50) | 25  (1.73) |
| **G5** | 120 (4.56) | 190 (6.32) | 91 (2.82) | 82 (2.94) | 122  (3.15) | 176 (3.56) | 156 (3.23) | 73 (3.30) | 80 (2.86) | 91 (4.67) | 46  (1.74) | 62  (1.99) | 84  (3.07) | 37  (1.72) | 45  (1.73) | 17  (1.17) |
| **F#5** | 109 (4.14) | 92 (3.06) | 134 (4.16) | 168 (6.02) | 49 (1.26) | 45 (0.91) | 157 (3.25) | 83 (3.75) | 70 (2.50) | 49 (2.52) | 90  (3.41) | 97  (3.11) | 94  (3.44) | 55  (2.56) | 63  (2.42) | 30  (2.07) |
| **F5** | 188 (7.14) | 302 (10.04) | 225 (6.98) | 139 (4.98) | 342 (8.83) | 378 (7.65) | 230 (4.77) | 120 (5.42) | 185 (6.60) | 192 (9.86) | 84  (3.19) | 152  (4.87) | 120  (4.39) | 110  (5.12) | 84  (3.22) | 34  (2.35) |
| **E5** | 210 (7.97) | 275 (9.14) | 228 (7.07) | 194 (6.95) | 156 (4.03) | 354 (7.16) | ***393 (8.15)*** | 106 (4.79) | 201  (7.18) | 94 (4.83) | 215  (8.15) | 138  (4.43) | 191  (6.98) | 167  (7.77) | 280  (10.75) | 133  (9.18) |
| **Eb5** | 199 (7.56) | 190 (6.32) | 238 (7.38) | ***371 (13.28)*** | 380 (9.81) | 435 (8.80) | 265 (5.49) | 203 (9.18) | 134  (4.78) | 167 (8.58) | 193  (7.32) | ***281***  ***(9.01)*** | 220  (8.04) | 108  (5.02) | 75  (2.88) | 69  (4.76) |
| **D5** | ***264 (10.02)*** | ***374 (12.43)*** | 194 (6.02) | 326 (11.67) | 259 (6.69) | 479 (9.69) | 300 (6.22) | ***260 (11.75)*** | ***228 (8.14)*** | 223 (11.45) | 192  (7.28) | 191  (6.13) | 227  (8.30) | 161  (7.49) | 179  (6.87) | 109  (7.52) |
| **C#5** | 144  (5.47) | 101 (3.36) | 244 (7.57) | 240 (8.59) | 255 (6.58) | 319 (6.45) | 284 (5.89) | 166 (7.50) | 192  (6.85) | 134  (6.88) | 164 (6.22) | 280  (8.98) | 205  (7.50) | 139  (6.47) | 174 (6.68) | 109  (7.52) |
| **C5** | 225 (8.54) | 316 (10.51) | 241 (7.47) | 201 (7.20) | **449 (11.59)** | ***692 (14)*** | 390 (8.08) | 212 (9.58) | 216 (7.71) | ***243 (12.48)*** | 260  (9.86) | 274  (8.79) | ***266***  ***(9.73)*** | ***176***  ***(8.19)*** | 230  (8.83) | 146  (10.08) |
| **B4** | 176 (6.68) | 118 (3.92) | 200 (6.20) | 203 (7.27) | 140 (3.61) | 316 (6.39) | 392 (8.13) | 113 (5.11) | 155 (5.53) | 90 (4.62) | ***305***  ***(11.57)*** | 147  (4.71) | 135  (4.94) | 152  (7.07) | ***333***  ***(12.78)*** | ***203***  ***(14.01)*** |
| **Bb4** | 101 (3.83) | 177 (5.88) | 217 (6.73) | 154 (5.51) | 367 (9.47) | 400  (8.09) | 318 (6.59) | 183 (8.27) | 216 (7.71) | 200  (10.27) | 167 (6.33) | 223  (7.15) | 183  (6.69) | 162  (7.53) | 84  (3.22) | 78  (5.38) |
| **A4** | 176 (6.68) | 175 (5.82) | 138 (4.28) | 95 (3.40) | 214 (5.52) | 258 (5.22) | 327 (6.78) | 120 (5.42) | 205 (7.32) | 107 (5.50) | 129 (4.89) | 251  (8.05) | 137  (5.01) | 121  (5.63) | 290 (11.13) | 137  (9.45) |
| **G#4** | 86  (3.26) | 58 (1.93) | ***286 (8.87)*** | 124 (4.44) | 304 (7.85) | 323 (6.54) | 270 (5.60) | 87 (3.93) | 160 (5.71) | 53  (2.72) | 134 (5.08) | 234  (7.50) | 143  (5.23) | 135  (6.28) | 120  (4.61) | 105  (7.25) |
| **G4** | 140 (5.32) | 137 (4.55) | 116 (3.60) | 79 (2.83) | 219 (5.65) | 224 (4.53) | 207 (4.29) | 129 (5.83) | 120 (4.28) | 79  (4.06) | 120 (4.55) | 210  (6.74) | 128  (4.68) | 88  (4.09) | 193  (7.41) | 62  (4.28) |
| **F#4** | 71  (2.70) | 53 (1.76) | 118 (3.66) | 76 (2.72) | 51  (1.32) | 69 (1.40) | 161 (3.34) | 92 (4.16) | 87 (3.11) | 25  (1.28) | 130 (4.93) | 129  (4.14) | 83  (3.03) | 121  (5.63) | 121  (4.64) | 73  (5.04) |
| **F4** | 111 (4.21) | 108 (3.59) | 180 (5.58) | 47 (1.68) | 126 (3.25) | 140 (2.83) | 218 (4.52) | 77 (3.48) | 170 (6.07) | 59  (3.03) | 115 (4.36) | 141  (4.52) | 140  (5.12) | 87  (4.05) | 79  (3.03) | 18  (1.24) |
| **E4** | 62  (2.35) | 43 (1.43) | 53 (1.64) | 38 (1.36) | 44  (1.14) | 60 (1.21) | 213 (4.42) | 21 (0.95) | 71  (2.53) | 10  (0.51) | 96  (3.64) | 71  (2.28) | 87  (3.18) | 96  (4.47) | 115  (4.41) | 41  (2.83) |
| **Eb4** | 40  (1.52) | 39 (1.30) | 45 (1.40) | 22 (0.79) | 120 (3.10) | 39 (0.79) | 132 (2.74) | 41 (1.85) | 33  (1.18) | 11  (0.56) | 45  (1.71) | 47  (1.51) | 59  (2.16) | 119  (5.53) | 23  (0.88) | 17  (1.17) |
| **D4** | 35  (1.33) | 28 (0.93) | 24 (0.74) | 7 (0.25) | 58  (1.50) | 21 (0.42) | 62 (1.29) | 26 (1.18) | 38  (1.36) | 16  (0.82) | 20  (0.76) | 39  (1.25) | 43  (1.57) | 25  (1.16) | 54  (2.07) | 5  (0.35) |
| **C#4** | 14  (0.53) | 11 (0.37) | 15 (0.47) | 5 (0.18) | 17  (0.44) | 1  (0.02) | 65 (1.35) | 13 (0.59) | 12  (0.43) | 1 (0.05) | 18  (0.68) | 26  (0.83) | 46  (1.68) | 21  (0.98) | 2  (0.08) | 1  (0.07) |
| **C4** | 23  (0.87) | 13 (0.43) | 13 (0.40) | 0  (0) | 24  (0.62) | 5  (0.10) | 21 (0.44) | 4 (0.18) | 35  (1.25) | 1  (0.05) | 26  (0.99) | 16  (0.51) | 14  (0.51) | 13  (0.60) | 5  (0.19) | 1  (0.07) |
| **B3** | 8  (0.30) | 2 (0.07) | 6 (0.19) | 7 (0.25) | 1  (0.03) | 1  (0.02) | 6 (0.12) | 0  (0) | 10  (0.36) | 0  (0) | 10  (0.38) | 10  (0.32) | 1  (0.04) | 3  (0.14) | 11  (0.42) | 10  (0.69) |
| **Bb3** | 0  (0) | 8 (0.27) | 2 (0.06) | 0  (0) | 2  (0.05) | 0  (0) | 5 (0.10) | 2 (0.09) | 6  (0.21) | 0  (0) | 1  (0.04) | 4  (0.13) | 0  (0) | 2  (0.09) | 1  (0.04) | 1  (0.07) |
| **A3** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 3 (0.06) | 0  (0) | 3  (0.11) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **G#3** | 0  (0) | 1 (0.03) | 0  (0) | 0  (0) | 2  (0.05) | 0  (0) | 1 (0.02) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **G3** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1 (0.02) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **F#3** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1 (0.02) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **Total** | 2634 | 3008 | 3225 | 2793 | 3874 | 4942 | 4824 | 2212 | 2801 | 1947 | 2637 | 3118 | 2735 | 2150 | 2605 | 1449 |

**NOTE:** Frequencies are reported as N(%)

**Table 2s:** Absolute and relative frequency of every notes for mezzosoprano and contralto roles

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Fenena** | **Maddalena** | **Azucena** | **Ulrica** | **Preziosilla** | **Eboli** | **Amneris** | **Quickly** |
| **C6** | 0  (0) | 0  (0) | 1  (0,04) | 0  (0) | 2  (0,12) | 0  (0) | 0  (0) | 0  (0) |
| **B5** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 7  (0,43) | 2  (0,08) | 2  (0,07) | 0  (0) |
| **Bb5** | 0  (0) | 0  (0) | 3  (0,13) | 0  (0) | 1  (0,06) | 5  (0,21) | 10  (0,37) | 0  (0) |
| **A5** | 8  (0,84) | 0  (0) | 9  (0,39) | 0  (0) | 5  (0,30) | 14  (0,59) | 7  (0,26) | 0  (0) |
| **G#5** | 2  (0,21) | 0  (0) | 1  (0,04) | 3  (0,27) | 12  (0,73) | 13  (0,55) | 19  (0,71) | 0  (0) |
| **G5** | 8  (0,84) | 0  (0) | 33  (1,43) | 12  (1,09) | 19  (1,16) | 27  (1,14) | 28  (1,04) | 3  (0,14) |
| **F#5** | 13  (1,36) | 1  (0,13) | 24  (1,04) | 11  (1) | 42  (2,56) | 23  (0,97) | 31  (1,15) | 3  (0,14) |
| **F5** | 20  (2,09) | 0  (0) | 60  (2,59) | 8  (0,72) | 24  (1,46) | 66  (2,79) | 74  (2,75) | 10  (0,48) |
| **E5** | 50  (5,22) | 3  (0,40) | 120  (5,19) | 41  (3,71) | 122  (7,44) | 95  (4,02) | 88  (3,27) | 48  (2,31) |
| **Eb5** | 54  (5,64) | 4  (0,53) | 79  (3,41) | 25  (2,26) | 87  (5,30) | 87  (3,68) | 101  (3,75) | 13  (0,63) |
| **D5** | 100  (10,44) | 48  (6,32) | 190  (8,21) | 40  (3,62) | 72  (4,39) | 121  (5,12) | 140  (5,20) | 60  (2,89) |
| **C#5** | 51  (5,32) | 28  (3,69) | 73  (3,15) | 73  (6,61) | 135  (8,23) | 178  (7,54) | 110  (4,08) | 58  (2,79) |
| **C5** | 68  (7,10) | 28  (3,69) | 256  (11,06) | 61  (5,52) | 131  (7,99) | 186  (7,87) | 212  (7,87) | 121  (5,83) |
| **B4** | 100  (10,44) | 48  (6,32) | 293  (12,66) | 84  (7,60) | ***227***  ***(13,84)*** | 186  (7,87) | 212  (7,87) | 151  (7,27) |
| **Bb4** | 56  (5,85) | 38  (5,01) | 103  (4,45) | 65  (5,88) | 81  (4,94) | 138  (5,84) | 125  (4,64) | 87  (4,19) |
| **A4** | ***145***  ***(15,14)*** | 162  (21,34) | ***300***  ***(12,96)*** | 89  (8,05) | 100  (6,10) | 167  (7,07) | **316**  **(11,73)** | 210  (10,12) |
| **G#4** | 16  (1,67) | ***173***  ***(22,79)*** | 130  (5,62) | 106  (9,59) | 94  (5,73) | 134  (5,67) | 175  (6,50) | 96  (4,62) |
| **G4** | 80  (8,35) | 33  (4,35) | 198  (8,56) | 75  (6,79) | 148  (9,02) | 166  (7,03) | 187  (6,94) | 236  (11,37) |
| **F#4** | 51  (5,32) | 48  (6,32) | 104  (4,49) | 76  (6,88) | 119  (7,26) | 126  (5,33) | 143  (5,31) | 127  (6,12) |
| **F4** | 66  (6,89) | 32  (4,22) | 78  (3,37) | ***110***  ***(9,95)*** | 29  (1,77) | ***266***  ***(11,26)*** | 199  (7,39) | 125  (6,02) |
| **E4** | 24  (2,51) | 44  (5,80) | 111  (4,80) | 81  (7,33) | 91  (5,55) | 172  (7,28) | 191  (7,09) | ***289***  ***(13,92)*** |
| **Eb4** | 9  (0,94) | 20  (2,64) | 54  (2,33) | 39  (3,53) | 36  (2,20) | 81  (3,43) | 102  (3,79) | 78  (3,76) |
| **D4** | 17  (1,77) | 17  (2,24) | 54  (2,33) | 22  (1,99) | 20  (1,22) | 51  (2,16) | 69  (2,56) | 97  (4,67) |
| **C#4** | 4  (0,42) | 17  (2,24) | 5  (0,22) | 27  (2,44) | 22  (1,34) | 34  (1,44) | 88  (3,27) | 53  (2,55) |
| **C4** | 13  (1,36) | 13  (1,71) | 16  (0,69) | 40  (3,62) | 3  (0,18) | 20  (0,85) | 32  (1,19) | 110  (5,30) |
| **B3** | 4  (0,42) | 2  (0,26) | 15  (0,65) | 6  (0,54) | 9  (0,55) | 2  (0,08) | 23  (0,85) | 68  (3,28) |
| **Bb3** | 0  (0) | 0  (0) | 0  (0) | 6  (0,54) | 0  (0) | 2  (0,08) | 5  (0,19) | 11  (0,53) |
| **A3** | 0  (0) | 0  (0) | 4  (0,17) | 3  (0,27) | 2  (0,12) | 0  (0) | 2  (0,07) | 11  (0,53) |
| **G#3** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 2  (0,07) | 3  (0,14) |
| **G3** | 0  (0) | 0  (0) | 0  (0) | 2  (0,18) | 0  (0) | 0  (0) | 0  (0) | 8  (0,39) |
| **Total** | 958 | 759 | 2314 | 1105 | 1640 | 2362 | 2693 | 2076 |

**NOTE:** Frequencies are reported as N(%)

**Table 3s:** Absolute and relative frequency of every notes for tenor roles

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Ismaele** | **Ernani** | **Macduff** | **Duca** | **Manrico** | **Alfredo** | **Arrigo** | **Gabrilele** | **Riccardo** | **Alvaro** | **Don Carlo** | **Radames** | **Cassio** | **Otello** | **Fenton** |
| **D5** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,02) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **C#5** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **C5** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 2  (0,04) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,03) | 0  (0) |
| **B4** | 0  (0) | 0  (0) | 0  (0) | 1  (0,04) | 0  (0) | 0  (0) | 2  (0,04) | 0  (0) | 0  (0) | 2  (0,08) | 7  (0,19) | 0  (0) | 1  (0,12) | 2  (0,06) | 1  (0,09) |
| **Bb4** | 1  (0,08) | 4  (0,12) | 7  (0,56) | 11  (0,39) | 1  (0,03) | 4  (0,13) | 31  (0,64) | 9  (0,51) | 11  (0,31) | 10  (0,39) | 30  (0,80) | 24  (0,97) | 2  (0,24) | 9  (0,29) | 5  (0,45) |
| **A4** | 21  (1,72) | 53  (1,59) | 10  (0,81) | 26  (0,91) | 31  (1,05) | 36  (1,19) | 79  (1,63) | 25  (1,41) | 49  (1,36) | 20  (0,79) | 34  (0,90) | 40  (1,62) | 20  (2,37) | 31  (1,01) | 19  (1,70) |
| **G#4** | 27  (2,22) | 45  (1,35) | 69  (5,56) | 105  (3,69) | 69  (2,34) | 64  (2,11) | 128  (2,63) | 59  (3,34) | 67  (1,87) | 69  (2,71) | 68  (1,81) | 44  (1,78) | 18  (2,13) | 59  (1,91) | 26  (2,33) |
| **G4** | 57  (4,68) | 233  (6,98) | 53  (4,27) | 114  (4,01) | 178  (6,03) | 145  (4,79) | 186  (3,83) | 54  (3,05) | 131  (3,65) | 96  (3,77) | 117  (3,11) | 105  (4,25) | 20  (2,37) | 85  (2,76) | 37  (3,31) |
| **F#4** | 155  (12,73) | 122  (3,65) | 90  (7,25) | 192  (6,75) | 135  (4,57) | 74  (2,44) | 206  (4,24) | 119  (6,73) | 98  (2,73) | 87  (3,42) | 139  (3,70) | 86  (3,48) | 39  (4,62) | 155  (5,03) | 55  (4,92) |
| **F4** | 80  (6,57) | 335  (10,03) | ***196***  ***(15,79)*** | 240  (8,44) | 268  (9,08) | 280  (9,25) | 487  (10,02) | 88  (4,97) | 301  (8,38) | 174  (6,83) | 201  (5,35) | 193  (7,82) | 61  (7,23) | 170  (5,52) | 53  (4,74) |
| **E4** | ***176***  ***(14,45)*** | 398  (11,92) | 95  (7,66) | 193  (6,78) | 250  (8,47) | 242  (7,99) | 447  (9,20) | 160  (9,04) | 288  (8,02) | 186  (7,30) | 281  (7,47) | 155  (6,28) | 59  (6,99) | 278  (9,02) | 107  (9,57) |
| **Eb4** | 92  (7,55) | 319  (9,55) | 103  (8,30) | ***468***  ***(16,45)*** | ***389***  ***(13,18)*** | 283  (9,35) | 339  (6,98) | 164  (9,27) | 335  (9,33) | 293  (11,50) | 428  (11,38) | 196  (7,94) | 74  (8,77) | 246  (7,98) | 99  (8,86) |
| **D4** | 153  (12,56) | ***449***  ***(13,45)*** | 72  (5,80) | 202  (7,10) | 325  (11,01) | 364  (12,02) | 461  (9,49) | 155  (8,76) | 261  (7,27) | 160  (6,28) | 265  (7,05) | 214  (8,67) | ***97***  ***(11,49)*** | 239  (7,76) | 105  (9,39) |
| **C#4** | 71  (5,83) | 151  (4,52) | 92  (7,41) | 343  (12,06) | 327  (11,08) | 200  (6,61) | 448  (9,22) | ***194***  ***(10,97)*** | 344  (9,58) | 242  (9,50) | 300  (7,98) | 205  (8,31) | 86  (10,19) | 289  (9,38) | 59  (5,28) |
| **C4** | 68  (5,58) | 389  (11,65) | 118  (9,51) | 182  (6,40) | 327  (11,08) | ***426***  ***(14,07)*** | ***591***  ***(12,17)*** | 144  (8,14) | ***430***  ***(11,97)*** | ***303***  ***(11,90)*** | ***440***  ***(11,70)*** | 243  (9,85) | 89  (10,55) | ***360***  ***(11,68)*** | ***122***  ***(10,91)*** |
| **B3** | 95  (7,80) | 210  (6,29) | 91  (7,33) | 133  (4,67) | 140  (4,74) | 165  (5,45) | 350  (7,20) | 161  (9,10) | 193  (5,37) | 186  (7,30) | 329  (8,75) | ***265***  ***(10,74)*** | 68  (8,06) | 266  (8,63) | 111  (9,93) |
| **Bb3** | 26  (2,13) | 182  (5,45) | 34  (2,74) | 206  (7,24) | 164  (5,56) | 285  (9,41) | 336  (6,92) | 99  (5,60) | 265  (7,38) | 202  (7,93) | 290  (7,71) | 191  (7,74) | 44  (5,21) | 172  (5,58) | 97  (8,68) |
| **A3** | 86  (7,06) | 114  (3,41) | 37  (2,98) | 115  (4,04) | 197  (3,29) | 150  (4,95) | 204  (4,20) | 110  (6,22) | 215  (5,99) | 94  (3,69) | 145  (3,86) | 148  (6,00) | 48  (5,69) | 155  (5,03) | 50  (4,47) |
| **G#3** | 8  (0,66) | 82  (2,46) | 69  (5,56) | 148  (5,20) | 102  (3,46) | 105  (3,47) | 235  (4,84) | 80  (4,52) | 223  (6,21) | 135  (5,30) | 226  (6,01) | 74  (3,00) | 27  (3,20) | 200  (6,49) | 71  (6,35) |
| **G3** | 34  (2,79) | 96  (2,88) | 37  (2,98) | 36  (1,27) | 117  (3,96) | 120  (3,96) | 100  (2,06) | 40  (2,26) | 119  (3,31) | 103  (4,04) | 249  (6,62) | 81  (3,28) | 34  (4,03) | 157  (5,10) | 52  (4,65) |
| **F#3** | 10  (0,82) | 53  (1,59) | 14  (1,13) | 48  (1,69) | 6  (0,20) | 27  (0,89) | 69  (1,42) | 72  (4,07) | 65  (1,81) | 80  (3,14) | 65  (1,73) | 63  (2,55) | 16  (1,90) | 80  (2,60) | 27  (2,42) |
| **F3** | 18  (1,48) | 48  (1,44) | 19  (1,53) | 32  (1,12) | 14  (0,47) | 48  (1,59) | 106  (2,18) | 9  (0,51) | 114  (3,17) | 64  (2,51) | 99  (2,63) | 67  (2,71) | 15  (1,78) | 48  (1,56) | 10  (0,89) |
| **E3** | 12  (0,99) | 19  (0,57) | 18  (1,45) | 15  (0,53) | 8  (0,27) | 6  (0,20) | 21  (0,43) | 5  (0,28) | 26  (0,72) | 21  (0,82) | 30  (0,80) | 29  (1,18) | 6  (0,71) | 42  (1,36) | 6  (0,54) |
| **Eb3** | 3  (0,25) | 6  (0,18) | 13  (1,05) | 22  (0,77) | 3  (0,10) | 4  (0,13) | 13  (0,27) | 2  (0,11) | 30  (0,84) | 12  (0,47) | 10  (0,27) | 19  (0,77) | 14  (1,66) | 25  (0,81) | 5  (0,45) |
| **D3** | 12  (0,99) | 8  (0,24) | 1  (0,08) | 2  (0,07) | 0  (0) | 0  (0) | 11  (0,23) | 2  (0,11) | 13  (0,36) | 4  (0,16) | 4  (0,11) | 6  (0,24) | 0  (0) | 5  (0,16) | 0  (0) |
| **C#3** | 4  (0,33) | 14  (0,42) | 1  (0,08) | 8  (0,28) | 1  (0,03) | 0  (0) | 3  (0,06) | 3  (0,17) | 9  (0,25) | 2  (0,08) | 1  (0,03) | 12  (0,49) | 2  (0,24) | 4  (0,13) | 1  (0,09) |
| **C3** | 5  (0,41) | 2  (0,06) | 1  (0,08) | 3  (0,11) | 0  (0) | 0  (0) | 2  (0,04) | 2  (0,85) | 3  (0,08) | 1  (0,04) | 2  (0,05) | 1  (0,04) | 4  (0,47) | 2  (0,06) | 0  (0) |
| **B2** | 4  (0,33) | 5  (0,15) | 1  (0,08) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,03) | 0  (0) |
| **Bb2** | 0  (0) | 2  (0,06) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,03) | 1  (0,04) | 0  (0) | 7  (0,28) | 0  (0) | 0  (0) | 0  (0) |
| **Total** | 1218 | 3339 | 1241 | 2845 | 2952 | 3028 | 4858 | 1769 | 3591 | 2547 | 3760 | 2468 | 844 | 3081 | 1118 |

**NOTE:** Frequencies are reported as N(%)

**Table 4s:** Absolute and relative frequency of every notes for baritone roles

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Nabucco** | **Carlo V** | **Macbeth** | **Rigoletto** | **Conte** | **Germont** | **Monforte** | **Paolo** | **Simone** | **Renato** | **Don Carlo** | **Melitone** | **Rodrigo** | **Amonasro** | **Iago** | **Falstaff** | **Ford** |
| **B4** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,03) | 0  (0) |
| **Bb4** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **A4** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 3  (0,09) | 3  (0,08) | 0  (0) |
| **G#4** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) |
| **G4** | 2  (0,08) | 3  (0,11) | 3  (0,10) | 7  (0,20) | 2  (0,08) | 0  (0) | 1  (0,03) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,06) | 4  (0,14) | 0  (0) | 3  (0,09) | 3  (0,08) | 10  (0,41) |
| **F#4** | 0  (0) | 5  (0,19) | 6  (0,20) | 3  (0,08) | 13  (0,49) | 4  (0,20) | 7  (0,24) | 0  (0) | 5  (0,19) | 9  (0,32) | 6  (0,32) | 8  (0,46) | 11  (0,39) | 4  (0,38) | 13  (0,37) | 10  (0,27) | 9  (0,37) |
| **F4** | 31  (1,23) | 62  (2,33) | 43  (1,42) | 60  (1,69) | 66  (2,50) | 42  (2,07) | 41  (1,38) | 4  (0,36) | 28  (1,04) | 55  (1,93) | 16  (0,86) | 16  (0,91) | 31  (1,11) | 18  (1,70) | 26  (0,74) | 27  (0,73) | 10  (0,41) |
| **E4** | 37  (1,47) | 97  (3,65) | 68  (2,25) | 57  (1,60) | 57  (2,16) | 11  (0,54) | 92  (3,11) | 2  (0,18) | 64  (2,38) | 64  (2,24) | 81  (4,36) | 58  (3,30) | 57  (2,04) | 19  (1,79) | 65  (1,84) | 93  (2,51) | 68  (2,81) |
| **Eb4** | 136  (5,40) | 136  (5,11) | 150  (4,97) | 179  (5,03) | 102  (3,87) | 126  (6,22) | 125  (4,22) | 22  (1,97) | 82  (3,04) | 93  (3,26) | 94  (5,06) | 56  (3,19) | 77  (2,76) | 52  (4,90) | 56  (1,59) | 63  (1,70) | 80  (3,30) |
| **D4** | 278  (11,03) | 294  (11,05) | 179  (5,93) | 132  (3,71) | 154  (5,84) | 159  (7,85) | 166  (5,61) | 28  (2,51) | 153  (5,68) | 174  (6,09) | 64  (3,44) | 120  (6,83) | 121  (4,33) | 53  (5,00) | 181  (5,13) | 187  (5,05) | 134  (5,53) |
| **C#4** | 303  (12,02) | 251  (9,43) | 323  (10,69) | 346  (9,73) | 198  (7,51) | 137  (6,76) | 267  (9,02) | 26  (2,33) | 225  (8,35) | 199  (6,97) | 227  (12,22) | 177  (10,07) | 208  (7,45) | 81  (7,63) | 266  (7,54) | 189  (5,10) | 84  (3,47) |
| **C4** | **402**  **(15,95)** | **457**  **(17,17)** | **524**  **(17,35)** | **672**  **(18,89)** | **381**  **(14,46)** | 326  (16,09) | 286  (9,66) | **174**  **(15,58)** | **472**  **(17,53**) | 357  (12,50) | 166  (8,93) | **192**  **(10,93)** | **304**  **(10,89)** | **142**  **(13,38)** | 326  (9,24) | 360  (9,72) | 188  (7,76) |
| **B3** | 184  (7,30) | 195  (7,33) | 309  (10,23) | 228  (6,41) | 120  (4,55) | 102  (5,03) | 216  (7,29) | 125  (11,19) | 210  (7,80) | 166  (5,81) | **250**  **(13,46)** | 168  (9,56) | 282  (10,10) | 68  (6,41) | **400**  **(11,33)** | 363  (9,80) | 236  (9,74) |
| **Bb3** | 377  (14,96) | 299  (11,24) | 264  (8,74) | 372  (10,46) | 346  (13,13) | **329**  **(16,24)** | 270  (9,12) | 75  (6,71) | 308  (11,44) | **366**  **(12,82)** | 115  (6,19) | 153  (8,71) | 249  (8,92) | 137  (12,91) | 183  (5,19) | 158  (4,27) | 107  (4,41) |
| **A3** | 198  (7,86) | 263  (9,88) | 263  (8,71) | 197  (5,54) | 245  (9,30) | 119  (5,87) | 267  (9,02) | 110  (9,85) | 293  (10,88) | 278  (9,74) | 146  (7,86) | 110  (6,26) | 294  (10,53) | 86  (8,11) | 372  (10,54) | **431**  **(11,64)** | 226  (9,32) |
| **G#3** | 175  (6,94) | 166  (6,24) | 240  (7,94) | 369  (10,37) | 254  (9,64) | 164  (8,09) | **315**  **(10,64)** | 69  (6,18) | 175  (6,50) | 156  (5,46) | 178  (9,58) | 162  (9,22) | 235  (8,42) | 82  (7,73) | 250  (7,08) | 240  (6,48) | 153  (6,31) |
| **G3** | 131  (5,20) | 179  (6,73) | 227  (7,51) | 212  (5,96) | 206  (7,82) | 160  (7,90) | 191  (6,45) | 151  (13,52) | 264  (9,80) | 219  (7,67) | 108  (5,8)1 | 127  (7,23) | 275  (9,85) | 88  (8,29) | 339  (9,61) | 393  (10,61) | 268  (11,06) |
| **F#3** | 64  (2,54) | 33  (1,24) | 60  (1,99) | 198  (5,57) | 60  (2,28) | 58  (2,86) | 184  (6,21) | 109  (9,76) | 119  (4,42) | 87  (3,05) | 113  (6,08) | 95  (5,41) | 144  (5,16) | 38  (3,58) | 275  (7,79) | 263  (7,10) | 223  (9,20) |
| **F3** | 108  (4,29) | 103  (3,87) | 193  (6,39) | 214  (6,02) | 201  (7,63) | 156  (7,70) | 217  (7,33) | 59  (5,28) | 127  (4,72) | 284  (9,95) | 77  (4,14) | 110  (6,26) | 152  (5,44) | 84  (7,92) | 291  (8,25) | 233  (6,29) | 123  (5,07) |
| **E3** | 25  (0,99) | 61  (2,29) | 57  (1,89) | 91  (2,56) | 66  (2,50) | 22  (1,09) | 110  (3,71) | 69  (6,18) | 70  (2,60) | 110  (3,85) | 129  (6,94) | 71  (4,04) | 157  (5,62) | 17  (1,60) | 189  (5,36) | 269  (7,26) | 167  (6,89) |
| **Eb3** | 28  (1,11) | 16  (0,60) | 46  (1,52) | 103  (2,90) | 74  (2,81) | 53  (2,62) | 97  (3,28) | 21  (1,88) | 51  (1,89) | 108  (3,78) | 47  (2,53) | 49  (2,79) | 108  (3,87) | 33  (3,11) | 108  (3,06) | 120  (3,24) | 100  (4,13) |
| **D3** | 31  (1,23) | 16  (0,60) | 30  (0,99) | 32  (0,90) | 21  (0,80) | 32  (1,58) | 18  (0,61) | 20  (1,79) | 27  (1,00) | 68  (2,38) | 13  (0,70) | 24  (1,37) | 27  (0,97) | 12  (1,13) | 60  (1,70) | 141  (3,81) | 98  (4,04) |
| **C#3** | 6  (0,24) | 7  (0,26) | 17  (0,56) | 50  (1,41) | 30  (1,14) | 18  (0,89) | 54  (1,82) | 13  (1,16) | 9  (0,33) | 21  (0,74) | 14  (0,75) | 32  (1,82) | 13  (0,47) | 36  (3,39) | 38  (1,08) | 57  (1,54) | 48  (1,98) |
| **C3** | 3  (0,12) | 15  (0,56) | 18  (0,60) | 22  (0,62) | 30  (1,14) | 6  (0,30) | 24  (0,81) | 28  (2,51) | 10  (0,37) | 26  (0,91) | 6  (0,32) | 18  (1,02) | 29  (1,04) | 6  (0,57) | 63  (1,79) | 83  (2,24) | 38  (1,57) |
| **B2** | 1  (0,04) | 0  (0) | 1  (0,03) | 7  (0,20) | 2  (0,08) | 1  (0,05) | 8  (0,27) | 12  (1,07) | 1  (0,04) | 7  (0,25) | 7  (0,38) | 7  (0,40) | 6  (0,21) | 2  (0,19) | 7  (0,20) | 8  (0,22) | 27  (1,11) |
| **Bb2** | 0  (0) | 2  (0,08) | 0  (0) | 6  (0,17) | 4  (0,15) | 1  (0,05) | 3  (0,10) | 0  (0) | 0  (0) | 2  (0,07) | 1  (0,05) | 0  (0) | 6  (0,21) | 2  (0,19) | 13  (0,37) | 4  (0,11) | 10  (0,41) |
| **A2** | 0  (0) | 1  (0,04) | 0  (0) | 0  (0) | 1  (0,04) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 6  (0,21) | 0  (0) | 2  (0,11) | 1  (0,04) | 1  (0,09) | 1  (0,03) | 2  (0,05) | 7  (0,29) |
| **G#2** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 2  (0,08) | 0  (0) | 2  (0,07) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,04) | 0  (0) | 0  (0) | 1  (0,03) | 5  (0,21) |
| **G2** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,06) | 0  (0) | 0  (0) | 0  (0) | 1  (0,03) | 3  (0,12) |
| **F#2** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,03) | 0  (0) | 1  (0,04) |
| **F2** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,04) |
| **Total** | 2520 | 2661 | 3021 | 3557 | 2635 | 2026 | 2961 | 1117 | 2693 | 2855 | 1858 | 1757 | 2792 | 1061 | 3529 | 3703 | 2424 |

**NOTE:** Frequencies are reported as N(%)

**Table 5s:** Absolute and relative frequency of every notes for bass roles

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Zaccaria** | **Silva** | **Banco** | **Sparafucile** | **Ferrando** | **Procida** | **Fiesco** | **Guardiano** | **Filippo** | **Inquisitore** | **Ramfis** |
| **F#4** | 4  (0,22) | 6  (0,21) | 0  (0) | 1  (0,14) | 0  (0) | 0  (0) | 0  (0) | 2  (0,14) | 2  (0,11) | 0  (0) | 0  (0) |
| **F4** | 4  (0,22) | 6  (0,21) | 0  (0) | 2  (0,29) | 5  (0,28) | 10  (0,28) | 2  (0,15) | 0  (0) | 3  (0,16) | 4  (0,85) | 3  (0,21) |
| **E4** | 28  (1,52) | 17  (0,61) | 5  (0,61) | 4  (0,57) | 20  (1,13) | 27  (0,75) | 7  (0,52) | 15  (1,06) | 11  (0,58) | 2  (0,42) | 16  (1,10) |
| **Eb4** | 20  (1,08) | 64  (2,28) | 5  (0,61) | 8  (1,15) | 17  (0,96) | 31  (0,86) | 5  (0,37) | 12  (0,84) | 16  (0,85) | 3  (0,64) | 22  (1,51) |
| **D4** | 146  (7,91) | 52  (1,86) | 5  (0,61) | 35  (5,02) | 19  (1,07) | 66  (1,83) | 23  (1,71) | 19  (1,34) | 62  (3,28) | 21  (4,45) | 25  (1,71) |
| **C#4** | 75  (4,06) | 90  (3,21) | 19  (2,30) | 49  (7,03) | 39  (2,20) | 194  (5,38) | 43  (3,19) | 39  (2,74) | 73  (3,86) | 34  (7,20) | 49  (3,36) |
| **C4** | 128  (6,93) | 270  (9,64) | 56  (6,78) | 30  (4,30) | 96  (5,41) | 238  (6,59) | 108  (8,01) | 41  (2,89) | 131  (6,92) | 43  (9,11) | 62  (4,25) |
| **B3** | **297**  **(16,09)** | 213  (7,60) | 55  (6,66) | 65  (9,33) | 137  (7,72) | 237  (6,57) | 100  (7,42) | 136  (9,57) | 82  (4,33) | 36  (7,63) | 88  (6,03) |
| **Bb3** | 122  (6,61) | **369**  **(13,17)** | 80  (9,69) | 43  (6,17) | 43  (2,42) | 197  (5,46) | 102  (7,57) | 56  (3,94) | 203  (10,72) | 49  (10,38) | 130  (8,90) |
| **A3** | 290  (15,71) | 258  (9,21) | 79  (9,56) | **98**  **(14,06)** | **220**  **(12,39)** | 335  (9,28) | 113  (8,38) | 143  (10,06) | 164  (8,66) | **52**  **(11,02)** | 134  (9,18) |
| **G#3** | 68  (3,68) | 164  (5,86) | **119**  **(14,41)** | 24  (3,44) | 144  (8,11) | **406**  **(11,25)** | 132  (9,79) | **144**  **(10,13)** | 145  (7,66) | 26  (5,51) | **144**  **(9,86)** |
| **G3** | 179  (9,70) | 248  (8,85) | 84  (10,17) | 34  (4,88) | 206  (11,61) | 150  (4,16) | **137**  **(10,16)** | 109  (7,67) | 178  (9,40) | 29  (6,14) | 124  (8,49) |
| **F#3** | 136  (7,37) | 168  (6,00) | 53  (6,42) | 38  (5,45) | 149  (8,39) | 272  (7,54) | 122  (9,05) | 92  (6,47) | 66  (3,49) | 33  (6,99) | 93  (6,37) |
| **F3** | 48  (2,60) | 221  (7,89) | 61  (7,38) | 70  (10,04) | 106  (5,97) | 284  (7,87) | 63  (4,67) | 56  (3,94) | **227**  **(11,99)** | 24  (5,08) | 136  (9,32) |
| **E3** | 67  (3,63) | 181  (6,46) | 64  (7,75) | 49  (7,03) | 168  (9,46) | 254  (7,04) | 63  (4,67) | 133  (9,36) | 112  (5,92) | 37  (7,84) | 98  (6,71) |
| **Eb3** | 22  (1,19) | 109  (3,89) | 29  (3,51) | 14  (2,01) | 126  (7,10) | 184  (5,10) | 115  (8,53) | 72  (5,07) | 109  (5,76) | 15  (3,18) | 88  (6,03) |
| **D3** | 135  (7,31) | 79  (2,82) | 20  (2,42) | 65  (9,33) | 59  (3,32) | 172  (4,77) | 62  (4,60) | 108  (7,60) | 84  (4,44) | 15  (3,18) | 86  (5,89) |
| **C#3** | 13  (0,70) | 56  (2,00) | 33  (4,00) | 19  (2,73) | 50  (2,82) | 160  (4,43) | 60  (4,45) | 39  (2,74) | 58  (3,06) | 10  (2,12) | 50  (3,42) |
| **C3** | 20  (1,08) | 86  (3,07) | 27  (3,27) | 40  (5,74) | 73  (4,11) | 178  (4,93) | 50  (3,71) | 88  (6,19) | 93  (4,91) | 32  (6,78) | 33  (2,26) |
| **B2** | 22  (1,19) | 26  (0,93) | 26  (3,15) | 6  (0,86) | 43  (2,42) | 87  (2,41) | 18  (1,34) | 58  (4,08) | 9  (0,48) | 3  (0,64) | 17  (1,16) |
| **Bb2** | 8  (0,43) | 51  (1,82) | 1  (0,12) | 0  (0) | 35  (1,97) | 54  (1,50) | 9  (0,67) | 14  (0,99) | 37  (1,95) | 2  (0,42) | 33  (2,26) |
| **A2** | 7  (0,38) | 52  (1,86) | 3  (0,36) | 1  (0,14) | 6  (0,34) | 44  (1,22) | 2  (0,15) | 22  (1,55) | 11  (0,58) | 0  (0) | 18  (1,23) |
| **G#2** | 1  (0,05) | 7  (0,25) | 1  (0,12) | 0  (0) | 14  (0,79) | 15  (0,42) | 2  (0,15) | 4  (0,28) | 5  (0,26) | 1  (0,21) | 5  (0,34) |
| **G2** | 3  (0,16) | 7  (0,25) | 0  (0) | 0  (0) | 0  (0) | 4  (0,11) | 6  (0,45) | 17  (1,20) | 9  (0,48) | 0  (0) | 3  (0,21) |
| **F#2** | 3  (0,16) | 0  (0) | 0  (0) | 1  (0,14) | 0  (0) | 4  (0,11) | 2  (0,15) | 0  (0) | 0  (0) | 0  (0) | 2  (0,14) |
| **F2** | 0  (0) | 1  (0,04) | 1  (0,12) | 1  (0,14) | 0  (0) | 5  (0,14) | 2  (0,15) | 2  (0,14) | 3  (0,16) | 0  (0) | 1  (0,07) |
| **E2** | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 0  (0) | 1  (0,03) | 0  (0) | 0  (0) | 0  (0) | 1  (0,21) | 0  (0) |
| **Total** | 1846 | 2801 | 826 | 697 | 1775 | 3609 | 1348 | 1421 | 1893 | 472 | 1460 |

**NOTE:** Frequencies are reported as N(%)