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**Week 15 Assignment**

**Hand Sign**

Every vocalist has hand signals to direct something on the concert (example: [Mariah Carey](https://www.youtube.com/watch?v=VVW6d6AO-7M), [Agnez Mo](https://www.youtube.com/shorts/TYz7Y5JIMQw), [Ari Lasso](https://www.youtube.com/shorts/tynOPV4dhJ4), etc). Try to examine these videos to prove that every hand gesture of vocalist means directing any kind of properties such the tempo, pitch, note, volume. Since the amount of hand signals of vocalist are huge (it is hard to be counted precisely), please use t-test to solve it. Make the list of any hand signals.

List of videos:

1. <https://www.youtube.com/watch?v=MeVl09sVIes>
2. <https://www.youtube.com/watch?v=N77ivUK8DyM>
3. <https://www.youtube.com/watch?v=Q5bX5K76Hag>
4. <https://www.youtube.com/watch?v=_0HdaSW4E-w>
5. <https://www.youtube.com/watch?v=9ldOuVuas1c>
6. <https://www.youtube.com/watch?v=Ri7-vnrJD3k>
7. <https://www.youtube.com/watch?v=UcWal5F-WcQ>
8. <https://www.youtube.com/watch?v=hGNewhSUFjU>
9. <https://www.youtube.com/watch?v=sKGRcjzODVY>
10. <https://www.youtube.com/watch?v=NKYS8iWIYpg>

| No | Artist | Title | Time (seconds) |
| --- | --- | --- | --- |
| 0 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 45 |
| 1 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 68 |
| 2 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 94 |
| 3 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 100 |
| 4 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 117 |
| 5 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 141 |
| 6 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 145 |
| 7 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 169 |
| 8 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 176 |
| 9 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 185 |
| 10 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 225 |
| 11 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 236 |
| 12 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 264 |
| 13 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 284 |
| 14 | Ungu | Cinta Dalam Hati | 0 |
| 15 | Céline Dion | The Power of Love | 18 |
| 16 | Céline Dion | The Power of Love | 38 |
| 17 | Céline Dion | The Power of Love | 61 |
| 18 | Céline Dion | The Power of Love | 72 |
| 19 | Céline Dion | The Power of Love | 96 |
| 20 | Céline Dion | The Power of Love | 100 |
| 21 | Céline Dion | The Power of Love | 118 |
| 22 | Céline Dion | The Power of Love | 122 |
| 23 | Céline Dion | The Power of Love | 136 |
| 24 | Céline Dion | The Power of Love | 170 |
| 25 | Céline Dion | The Power of Love | 187 |
| 26 | Céline Dion | The Power of Love | 196 |
| 27 | Céline Dion | The Power of Love | 204 |
| 28 | Ariel NOAH | Tegar (Tribute to Rossa) | 21 |
| 29 | Ariel NOAH | Tegar (Tribute to Rossa) | 81 |
| 30 | Ariel NOAH | Tegar (Tribute to Rossa) | 89 |
| 31 | Ariel NOAH | Tegar (Tribute to Rossa) | 125 |
| 32 | Ariel NOAH | Tegar (Tribute to Rossa) | 156 |
| 33 | Ariel NOAH | Tegar (Tribute to Rossa) | 188 |
| 34 | Ariel NOAH | Tegar (Tribute to Rossa) | 203 |
| 35 | Ariel NOAH | Tegar (Tribute to Rossa) | 208 |
| 36 | Coldplay | Viva La Vida (Live in Madrid 2011) | 70 |
| 37 | Coldplay | Viva La Vida (Live in Madrid 2011) | 99 |
| 38 | Coldplay | Viva La Vida (Live in Madrid 2011) | 110 |
| 39 | Coldplay | Viva La Vida (Live in Madrid 2011) | 118 |
| 40 | Coldplay | Viva La Vida (Live in Madrid 2011) | 120 |
| 41 | Coldplay | Viva La Vida (Live in Madrid 2011) | 125 |
| 42 | Coldplay | Viva La Vida (Live in Madrid 2011) | 139 |
| 43 | Coldplay | Viva La Vida (Live in Madrid 2011) | 188 |
| 44 | Coldplay | Viva La Vida (Live in Madrid 2011) | 235 |
| 45 | Coldplay | Viva La Vida (Live in Madrid 2011) | 248 |
| 46 | Coldplay | Viva La Vida (Live in Madrid 2011) | 255 |
| 47 | Coldplay | Viva La Vida (Live in Madrid 2011) | 265 |
| 48 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 24 |
| 49 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 57 |
| 50 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 62 |
| 51 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 66 |
| 52 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 73 |
| 53 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 85 |
| 54 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 93 |
| 55 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 117 |
| 56 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 125 |
| 57 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 136 |
| 58 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 158 |
| 59 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 169 |
| 60 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 189 |
| 61 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 211 |
| 62 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 220 |
| 63 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 223 |
| 64 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 237 |
| 65 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 46 |
| 66 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 52 |
| 67 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 72 |
| 68 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 102 |
| 69 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 111 |
| 70 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 122 |
| 71 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 137 |
| 72 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 152 |
| 73 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 168 |
| 74 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 187 |
| 75 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 216 |
| 76 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 233 |
| 77 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 310 |
| 78 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 323 |
| 79 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 341 |
| 80 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 361 |
| 81 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 405 |
| 82 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 416 |
| 83 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 430 |
| 84 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 455 |
| 85 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 473 |
| 86 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 494 |
| 87 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 512 |
| 88 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 50 |
| 89 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 53 |
| 90 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 104 |
| 91 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 172 |
| 92 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 196 |
| 93 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 228 |
| 94 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 240 |
| 95 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 250 |
| 96 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 272 |
| 97 | Jemimah | Cinta Dalam Hati (Ungu) | 20 |
| 98 | Jemimah | Cinta Dalam Hati (Ungu) | 85 |
| 99 | Jemimah | Cinta Dalam Hati (Ungu) | 111 |
| 100 | Jemimah | Cinta Dalam Hati (Ungu) | 159 |
| 101 | Jemimah | Cinta Dalam Hati (Ungu) | 169 |
| 102 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 29 |
| 103 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 40 |
| 104 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 68 |
| 105 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 81 |
| 106 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 106 |
| 107 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 153 |
| 108 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 169 |
| 109 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 319 |
| 110 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 347 |
| 111 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 352 |
| 112 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 360 |
| 113 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 366 |
| 114 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 377 |
| 115 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 393 |
| 116 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 402 |
| 117 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 433 |

**Hypothesis**

* Null hypothesis (H0): The hand signals used by the artist do not have a significant impact on directing properties such as tempo, pitch, note, and volume during concerts.
* Alternative hypothesis (H1): The hand signals used by the artist have a significant impact on directing properties such as tempo, pitch, note, and volume during concerts.

**Mean, std, samples**

Mean of the total time divided by the number of artists:

Mean = Total time / Total artist

Mean = 21277 / 10

Mean = 2127.7

Standard deviation for all dataset = 117.6017193

Standard deviation for each artist:

std1 Reza Artamevia (Feat. Rendy Pandugo) 70.32029492

std2 Ungu 0

std3 Céline Dion 58.07045303

std4 Ariel NOAH 62.57083486

std5 Coldplay 66.66374994

std6 Adele 65.36366196

std7 Katy Perry 152.1129443

std8 Rossa Feat Padi Reborn 80.31665725

std9 Jemimah 54.03850479

std10 Ari Lasso 144.618342

Amount of sample = 119

**Reza Artamevia (Feat. Rendy Pandugo) – Biar Menjadi Kenangan:**

Hand Signal Timestamps (seconds): 45, 68, 94, 100, 117, 141, 145, 169, 176, 185, 225, 236, 264, 284

Total timestamps: 14

Mean: 160.6428571

**Ungu – Cinta Dalam Hati:**

Hand Signal Timestamps (seconds): 0

Total timestamps: 1

Mean: 0

**Céline Dion – The Power of Love:**

Hand Signal Timestamps (seconds): 18, 38, 61, 72, 96, 100, 118, 122, 136, 170, 187, 196, 204

Total timestamps: 13

Mean: 116.7692308

**Ariel NOAH – Tegar (Tribute to Rossa):**

Hand Signal Timestamps (seconds): 21, 81, 89, 125, 156, 188, 203, 208

Total timestamps: 8

Mean: 133.875

**Coldplay – Viva La Vida (Live in Madrid 2011):**

Hand Signal Timestamps (seconds): 70, 99, 110, 118, 120, 125, 139, 188, 235, 248, 255, 265

Total timestamps: 12

Mean: 164.3333333

**Adele – Set Fire To The Rain (Live at The Royal Albert Hall):**

Hand Signal Timestamps (seconds): 24, 57, 62, 66, 73, 85, 93, 117, 125, 136, 158, 169, 189, 211, 220, 223, 237

Total timestamps: 17

Mean: 132.0588235

**Katy Perry – Roar & Firework (Live at The Coronation Concert):**

Hand Signal Timestamps (seconds): 46, 52, 72, 102, 111, 122, 137, 152, 168, 187, 216, 233, 310, 323, 341, 361, 405, 416, 430, 455, 473, 494, 512

Total timestamps: 23

Mean: 266

**Rossa Feat Padi Reborn – Terlanjur Cinta (Padi Reborn Sang Penghibur):**

Hand Signal Timestamps (seconds): 50, 53, 104, 172, 196, 228, 240, 250, 272

Total timestamps: 9

Mean: 173.8888889

**Jemimah – Cinta Dalam Hati (Ungu):**

Hand Signal Timestamps (seconds): 20, 85, 111, 159, 169

Total timestamps: 5

Mean: 108.8

**Ari Lasso – Hampa (Live Perform ITS EXPO 2017):**

Hand Signal Timestamps (seconds): 29, 40, 68, 81, 106, 153, 169, 319, 347, 352, 360, 366, 377, 393, 402, 433

Total timestamps: 16

Mean: 249.6875

**Z-Score**

| No | Artist | Title | Time (s) | z-score (use general std) | z-score (use each std) |
| --- | --- | --- | --- | --- | --- |
| 0 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 45 | -17.16381255 | -1.6445161 |
| 1 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 68 | -16.95080841 | -1.317441249 |
| 2 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 94 | -16.71002111 | -0.9477044603 |
| 3 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 100 | -16.65445481 | -0.862380586 |
| 4 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 117 | -16.49701696 | -0.620629609 |
| 5 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 141 | -16.27475176 | -0.2793341121 |
| 6 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 145 | -16.23770756 | -0.2224515293 |
| 7 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 169 | -16.01544236 | 0.1188439677 |
| 8 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 176 | -15.95061501 | 0.2183884876 |
| 9 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 185 | -15.86726556 | 0.346374299 |
| 10 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 225 | -15.49682357 | 0.9152001272 |
| 11 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 236 | -15.39495202 | 1.07162723 |
| 12 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 264 | -15.13564262 | 1.46980531 |
| 13 | Reza Artamevia (Feat. Rendy Pandugo) | Biar Menjadi Kenangan | 284 | -14.95042162 | 1.754218224 |
| 14 | Ungu | Cinta Dalam Hati | 0 | -17.5805598 | 0 |
| 15 | Céline Dion | The Power of Love | 18 | -17.4138609 | -1.700851735 |
| 16 | Céline Dion | The Power of Love | 38 | -17.2286399 | -1.356442505 |
| 17 | Céline Dion | The Power of Love | 61 | -17.01563576 | -0.9603718907 |
| 18 | Céline Dion | The Power of Love | 72 | -16.91376421 | -0.7709468143 |
| 19 | Céline Dion | The Power of Love | 96 | -16.69149901 | -0.3576557386 |
| 20 | Céline Dion | The Power of Love | 100 | -16.65445481 | -0.2887738927 |
| 21 | Céline Dion | The Power of Love | 118 | -16.48775591 | 0.02119441414 |
| 22 | Céline Dion | The Power of Love | 122 | -16.45071171 | 0.0900762601 |
| 23 | Céline Dion | The Power of Love | 136 | -16.32105701 | 0.3311627209 |
| 24 | Céline Dion | The Power of Love | 170 | -16.00618131 | 0.9166584116 |
| 25 | Céline Dion | The Power of Love | 187 | -15.84874346 | 1.209406257 |
| 26 | Céline Dion | The Power of Love | 196 | -15.76539401 | 1.36439041 |
| 27 | Céline Dion | The Power of Love | 204 | -15.69130561 | 1.502154102 |
| 28 | Ariel NOAH | Tegar (Tribute to Rossa) | 21 | -17.38607775 | -1.803955473 |
| 29 | Ariel NOAH | Tegar (Tribute to Rossa) | 81 | -16.83041476 | -0.8450422648 |
| 30 | Ariel NOAH | Tegar (Tribute to Rossa) | 89 | -16.75632636 | -0.7171871704 |
| 31 | Ariel NOAH | Tegar (Tribute to Rossa) | 125 | -16.42292856 | -0.1418392454 |
| 32 | Ariel NOAH | Tegar (Tribute to Rossa) | 156 | -16.13583601 | 0.3535992456 |
| 33 | Ariel NOAH | Tegar (Tribute to Rossa) | 188 | -15.83948241 | 0.8650196233 |
| 34 | Ariel NOAH | Tegar (Tribute to Rossa) | 203 | -15.70056666 | 1.104747925 |
| 35 | Ariel NOAH | Tegar (Tribute to Rossa) | 208 | -15.65426141 | 1.184657359 |
| 36 | Coldplay | Viva La Vida (Live in Madrid 2011) | 70 | -16.93228631 | -1.41506191 |
| 37 | Coldplay | Viva La Vida (Live in Madrid 2011) | 99 | -16.66371586 | -0.9800428778 |
| 38 | Coldplay | Viva La Vida (Live in Madrid 2011) | 110 | -16.56184431 | -0.8150356586 |
| 39 | Coldplay | Viva La Vida (Live in Madrid 2011) | 118 | -16.48775591 | -0.6950304082 |
| 40 | Coldplay | Viva La Vida (Live in Madrid 2011) | 120 | -16.46923381 | -0.6650290957 |
| 41 | Coldplay | Viva La Vida (Live in Madrid 2011) | 125 | -16.42292856 | -0.5900258142 |
| 42 | Coldplay | Viva La Vida (Live in Madrid 2011) | 139 | -16.29327386 | -0.3800166261 |
| 43 | Coldplay | Viva La Vida (Live in Madrid 2011) | 188 | -15.83948241 | 0.3550155323 |
| 44 | Coldplay | Viva La Vida (Live in Madrid 2011) | 235 | -15.40421307 | 1.060046378 |
| 45 | Coldplay | Viva La Vida (Live in Madrid 2011) | 248 | -15.28381942 | 1.25505491 |
| 46 | Coldplay | Viva La Vida (Live in Madrid 2011) | 255 | -15.21899207 | 1.360059504 |
| 47 | Coldplay | Viva La Vida (Live in Madrid 2011) | 265 | -15.12638157 | 1.510066067 |
| 48 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 24 | -17.3582946 | -1.653194149 |
| 49 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 57 | -17.05267995 | -1.148326475 |
| 50 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 62 | -17.00637471 | -1.071831373 |
| 51 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 66 | -16.96933051 | -1.010635291 |
| 52 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 73 | -16.90450316 | -0.903542148 |
| 53 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 85 | -16.79337056 | -0.7199539028 |
| 54 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 93 | -16.71928216 | -0.5975617393 |
| 55 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 117 | -16.49701696 | -0.2303852489 |
| 56 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 125 | -16.42292856 | -0.1079930854 |
| 57 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 136 | -16.32105701 | 0.06029613936 |
| 58 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 158 | -16.11731391 | 0.3968745889 |
| 59 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 169 | -16.01544236 | 0.5651638137 |
| 60 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 189 | -15.83022136 | 0.8711442224 |
| 61 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 211 | -15.62647826 | 1.207722672 |
| 62 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 220 | -15.54312881 | 1.345413856 |
| 63 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 223 | -15.51534566 | 1.391310917 |
| 64 | Adele | Set Fire To The Rain (Live at The Royal Albert Hall) | 237 | -15.38569097 | 1.605497203 |
| 65 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 46 | -17.1545515 | -1.446293746 |
| 66 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 52 | -17.0989852 | -1.406849371 |
| 67 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 72 | -16.91376421 | -1.275368121 |
| 68 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 102 | -16.63593271 | -1.078146247 |
| 69 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 111 | -16.55258326 | -1.018979685 |
| 70 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 122 | -16.45071171 | -0.9466649972 |
| 71 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 137 | -16.31179596 | -0.84805406 |
| 72 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 152 | -16.17288021 | -0.7494431228 |
| 73 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 168 | -16.02470341 | -0.6442581231 |
| 74 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 187 | -15.84874346 | -0.519350936 |
| 75 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 216 | -15.58017301 | -0.328703124 |
| 76 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 233 | -15.42273517 | -0.2169440619 |
| 77 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 310 | -14.70963432 | 0.2892587491 |
| 78 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 323 | -14.58924067 | 0.3747215614 |
| 79 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 341 | -14.42254177 | 0.4930546861 |
| 80 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 361 | -14.23732077 | 0.6245359357 |
| 81 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 405 | -13.82983458 | 0.9137946848 |
| 82 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 416 | -13.72796303 | 0.9861093721 |
| 83 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 430 | -13.59830833 | 1.078146247 |
| 84 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 455 | -13.36678208 | 1.242497809 |
| 85 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 473 | -13.20008318 | 1.360830933 |
| 86 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 494 | -13.00560113 | 1.498886246 |
| 87 | Katy Perry | Roar & Firework (Live at The Coronation Concert) | 512 | -12.83890223 | 1.61721937 |
| 88 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 50 | -17.1175073 | -1.542505542 |
| 89 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 53 | -17.08972415 | -1.505153389 |
| 90 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 104 | -16.61741061 | -0.8701668033 |
| 91 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 172 | -15.98765921 | -0.02351802171 |
| 92 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 196 | -15.76539401 | 0.2752991953 |
| 93 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 228 | -15.46904042 | 0.6737221513 |
| 94 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 240 | -15.35790782 | 0.8231307598 |
| 95 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 250 | -15.26529732 | 0.9476379336 |
| 96 | Rossa Feat Padi Reborn | Terlanjur Cinta (Padi Reborn Sang Penghibur) | 272 | -15.06155422 | 1.221553716 |
| 97 | Jemimah | Cinta Dalam Hati (Ungu) | 20 | -17.3953388 | -1.643272706 |
| 98 | Jemimah | Cinta Dalam Hati (Ungu) | 85 | -16.79337056 | -0.4404266937 |
| 99 | Jemimah | Cinta Dalam Hati (Ungu) | 111 | -16.55258326 | 0.04071171119 |
| 100 | Jemimah | Cinta Dalam Hati (Ungu) | 159 | -16.10805286 | 0.928967228 |
| 101 | Jemimah | Cinta Dalam Hati (Ungu) | 169 | -16.01544236 | 1.114020461 |
| 102 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 29 | -17.31198935 | -1.525999378 |
| 103 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 40 | -17.2101178 | -1.449937104 |
| 104 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 68 | -16.95080841 | -1.256324042 |
| 105 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 81 | -16.83041476 | -1.166432263 |
| 106 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 106 | -16.59888851 | -0.9935634582 |
| 107 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 153 | -16.16361916 | -0.6685701043 |
| 108 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 169 | -16.01544236 | -0.557934069 |
| 109 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 319 | -14.62628487 | 0.4792787626 |
| 110 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 347 | -14.36697547 | 0.6728918245 |
| 111 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 352 | -14.32067022 | 0.7074655855 |
| 112 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 360 | -14.24658182 | 0.7627836032 |
| 113 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 366 | -14.19101552 | 0.8042721164 |
| 114 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 377 | -14.08914397 | 0.8803343908 |
| 115 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 393 | -13.94096718 | 0.9909704261 |
| 116 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 402 | -13.85761773 | 1.053203196 |
| 117 | Ari Lasso | Hampa (Live Perform ITS EXPO 2017) | 433 | -13.57052518 | 1.267560515 |

**Conclusion**

To find a 90% confidence, assume =0.1 (10% significant level) → value df 1.645

If the calculated z-score falls within the range of -1.645 to 1.645 (z-value), the null hypothesis (H0) is accepted. Otherwise, if the calculated z-score is outside the range, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted.

Based on the calculation before and the comparison between z-score and z-value, by using confidence level 90%, 96.6% data are inside the range. So,  H0 is accepted.