**Results:**

When n=5

|  |  |
| --- | --- |
| Topic Model | Coherence Score |
| LDA | 0.394 |
| NMF | 0.569 |
| LSA | 0.509 |

When n=4

|  |  |
| --- | --- |
| Topic Model | Coherence Score |
| LDA | 0.384 |
| NMF | 0.656 |
| LSA | 0.607 |

When n=3

|  |  |
| --- | --- |
| Topic Model | Coherence Score |
| LDA | 0.366 |
| NMF | 0.670 |
| LSA | 0.711 |

Results from NMF:

Case 1: When Topics = 4:

**Topic 1: Fandom Engagement and Multimedia Content**

* **Main Terms**: sserafim (abbreviation for "Le Sserafim"), le (common word in K-pop discussions), fearless (song by Le Sserafim), lesserafim (alternative spelling of Le Sserafim), sle (abbreviation or typo), today (current events), photo (images), youtube (video platform), korea (country of origin), lesserafimfearless (fan tag or identifier), june (month), sakura (member of Le Sserafim), issue (topic or problem), imlesserafim (fan tag or identifier), view (perspective or count)
* **Types of Support**:
  + **Emotional Support**: fearless, sakura, lesserafimfearless, imlesserafim
  + **Informational Support**: sserafim, le, korea, issue, view
  + **Instrumental Support**: photo, youtube

This topic revolves around fan engagement and multimedia content related to Le Sserafim. Emotional support is seen in fan tags and members, while informational support includes current events and issues discussed within the fandom. Multimedia platforms like YouTube and photo sharing provide instrumental support.

**Topic 2: Music Charts and Performance Metrics**

* **Main Terms**: melon (Korean music chart), bug (another chart or common term), nie (Korean music chart), flo (Korean music chart), uls (likely abbreviation for a chart term), kst (Korean Standard Time), lesserafim (K-pop group), fearless (song by Le Sserafim), peak (top performance), chart (ranking), new (recent releases), pm (time indicator), daily (frequency), week (time period), hit (popular song)
* **Types of Support**:
  + **Emotional Support**: fearless, lesserafim
  + **Informational Support**: melon, bug, genie, flo, uls, kst, chart, peak
  + **Instrumental Support**: daily, week, pm, new, hit

This topic focuses on music charts and performance metrics. Emotional support is seen in the songs and groups, while informational support is detailed in the different charts and rankings. Instrumental support includes time indicators and frequency of chart updates.

**Topic 3: Trading and Merchandise**

* **Main Terms**: wts (Want to Sell), lfb (Looking for Buyers), ph (Philippines), pc (photocard, price count), hybe (HYBE Corporation), insight (knowledge or understanding), onhand (available), enhypen (another K-pop group under HYBE), payo (Pay on Delivery), php (currency of the Philippines), set (collection), dm (Direct Message), photocards (collectible items), jake (member of Enhypen), ld (likely abbreviation)
* **Types of Support**:
  + **Instrumental Support**: wts, lfb, ph, pc, onhand, payo, php, set, dm, photocards
  + **Informational Support**: hybe, insight, enhypen, jake

This topic revolves around trading and merchandise activities within the K-pop community. Instrumental support is provided by terms related to buying and selling, while informational support is offered by the names of companies and group members.

**Topic 4: Music Releases and Member Activities**

* **Main Terms**: kazuha (member of Le Sserafim), lesserafim (K-pop group), arrival (new release), preview (teaser or sample), bank (potentially music bank, a music show), music (songs), imlesserafim (fan tag or identifier), le (common word), sserafim (abbreviation for Le Sserafim), sakura (member of Le Sserafim), love (affection), http (links), vote (fan participation), amp (amplifier or abbreviation for 'and'), eunchae (member of Le Sserafim), yunjin (member of Le Sserafim)
* **Types of Support**:
  + **Emotional Support**: kazuha, sakura, eunchae, yunjin, love
  + **Informational Support**: lesserafim, arrival, preview, bank, music, http, vote, amp
  + **Instrumental Support**: http
  + **Appraisal:** love.

This topic is about music releases and member activities. Emotional support is prominent with mentions of members and expressions of love, while informational support includes previews, new releases, and music shows.

Case 2: When Topics = 3:

**Topic 1: LE SSERAFIM and Multimedia Content**

* **Main Terms:**
  + lesserafim (alternative spelling of LE SSERAFIM)
  + sserafim (abbreviation for LE SSERAFIM)
  + le (common word in K-pop discussions)
  + kazuha (member of LE SSERAFIM)
  + fearless (song by LE SSERAFIM)
  + imlesserafim (fan tag or identifier)
  + music (general term for songs or albums)
  + bank (likely referring to Music Bank)
  + preview (short sample or teaser)
  + arrival (new release or arrival of music)
  + sakura (member of LE SSERAFIM)
  + sle (possibly abbreviation or typo, not fully clear)
  + today (current events)
  + photo (images)
  + korea (country of origin)
* **Types of Support:**
  + **Emotional Support:** fearless, kazuha, imlesserafim, sakura (support for the members and their music)
  + **Informational Support:** lesserafim, sserafim, le, music, korea (providing information about the group and their background)
  + **Instrumental Support:** preview, photo, bank (promotional tools and platforms for performances and content)
  + **Appraisal Support:** today, arrival (evaluations of current events and new releases)
* **Description:** This topic revolves around the K-pop girl group LE SSERAFIM, focusing on their members (Kazuha, Sakura), their song "Fearless," multimedia content (photos, previews), and their appearances on music shows like "Music Bank." It includes fan engagement through hashtags and mentions of current events and new releases in Korea.

**Topic 2: Music Charts and Performance Metrics**

* **Main Terms:**
  + melon (South Korean music streaming service)
  + bug (music streaming platform)
  + genie (South Korean music streaming service)
  + flo (South Korean music streaming service)
  + uls (Unique Listeners)
  + kst (Korea Standard Time)
  + fearless (song by LE SSERAFIM)
  + lesserafim (alternative spelling of LE SSERAFIM)
  + peak (highest position on music charts)
  + chart (ranking of songs or albums)
  + new (new releases)
  + pm (afternoon or post meridiem)
  + week (weekly rankings)
  + daily (daily rankings)
  + hit (popular songs)
* **Types of Support:**
  + **Informational Support:** melon, bug, genie, flo, uls, kst, chart, new, pm, week, daily (providing updates on music platforms, performance metrics, and rankings)
  + **Emotional Support:** fearless, lesserafim (enthusiasm for the song and group’s performance)
  + **Appraisal Support:** peak, hit (evaluations of the song's success)
* **Description:** This topic focuses on music charts and rankings on different platforms (Melon, Genie, Flo), specific metrics (Unique Listeners, peak positions), and the performance of the song "Fearless." It involves tracking new entries, weekly and daily updates, and the overall popularity of songs in the charts.

**Topic 3: Trading and Fan Activities**

* **Main Terms:**
  + wts (Want to Sell)
  + lfb (Looking for Buy)
  + ph (Philippines or physical copies)
  + pc (photocard, product cost)
  + hybe (HYBE Corporation)
  + insight (information or understanding)
  + onhand (items available or in possession)
  + enhypen (another K-pop group)
  + payo (possibly PayPal, often used in trading)
  + php (Philippine Peso)
  + set (a complete collection of items)
  + dm (direct message)
  + photocards (collectible items included in albums)
  + jake (member of Enhypen)
* **Types of Support:**
  + **Instrumental Support:** wts, lfb, onhand, payo, php, set, dm (terms used in trading communities)
  + **Informational Support:** hybe, insight, enhypen, pc, photocards, jake (providing information about trading activities, groups, and collectibles)
* **Description:** This topic is related to fan trading and activities. Terms like "Want to Sell" (WTS), "Looking for Buy" (LFB), and "onhand" are common in fan trading communities. It also references HYBE Corporation, another K-pop group (Enhypen), and trading-related items like photocards and sets. The topic includes fan interactions through direct messages and trading platforms.

Results from LDA (Latent Dirichlet Allocation):

Case 1: When Topics =5:

**Topic 0: Controversies and Discussions Around Idols**

* **Main Terms:** garam, week, think, best, center, vote, hybe, female, visual, idol
* **Likely Focus:** This topic appears to focus on discussions about specific idols, including Garam, and their roles or positions (e.g., center, visual). It also includes voting and evaluations of the best idols.
* **Support Indicators:**
  + **Informational Support:** think, best, center, vote, visual (providing opinions and evaluations).
  + **Emotional Support:** garam (likely discussions around controversies or support for the idol).
  + **Appraisal Support:** best, vote, visual, idol (assessing and evaluating idols).

A screenshot of a computer

Description automatically generated

**Topic 1: General Sentiments and Community Engagement**

* **Main Terms:** hybe, garam, just, stan, people, set, inc, group, girl, love
* **Likely Focus:** This topic centers on general sentiments within the community, including discussions about HYBE, Garam, and the group dynamics. It also mentions the act of being a dedicated fan (stan) and expressions of love and support.
* **Support Indicators:**
  + **Emotional Support:** garam, stan, love (showing support and dedication to idols).
  + **Informational Support:** hybe, group, girl, inc (providing information about the entertainment company and group dynamics).

**Topic 2: LE SSERAFIM and Fan Trading**

* **Main Terms:** lesserafim, sserafim, fearless, le, sakura, hybe, ph, wts, pc, lfb
* **Likely Focus:** This topic revolves around the K-pop girl group LE SSERAFIM, their song "Fearless," and fan trading activities, including "want to sell" (WTS), "looking for buy" (LFB), and photocards (PC).
* **Support Indicators:**
  + **Emotional Support:** fearless, sakura, lesserafim (support for the group's music and members).
  + **Instrumental Support:** wts, lfb, pc (facilitating fan trading activities).
  + **Informational Support:** lesserafim, sserafim, le, hybe, ph (providing information about the group and trading).

**Topic 3: Music Platforms and Chart Performance**

* **Main Terms:** hybe, melon, garam, fearless, lesserafim, wts, bug, genie, kst, flo
* **Likely Focus:** This topic focuses on the performance of music on various platforms (Melon, Genie, Flo) and chart tracking. It also includes discussions about Garam and fan trading (WTS).
* **Support Indicators:**
  + **Informational Support:** hybe, melon, fearless, lesserafim, bug, genie, kst, flo (providing updates on music platforms and chart performance).
  + **Instrumental Support:** wts (facilitating fan trading activities).

**Topic 4: Fan Trading and Engagement**

* **Main Terms:** hybe, wts, lesserafim, le, lfb, sserafim, ph, kazuha, insight, pc
* **Likely Focus:** This topic is centered around fan trading activities, including "want to sell" (WTS), "looking for buy" (LFB), and photocards (PC). It also involves discussions about the group LE SSERAFIM and its members, including Kazuha.
* **Support Indicators:**
  + **Instrumental Support:** wts, lfb, pc (facilitating fan trading activities).
  + **Informational Support:** hybe, lesserafim, le, sserafim, ph, insight (providing information about the group and trading).
  + **Emotional Support:** kazuha (support for the member).

Case 2: When Topics = 4:

**Topic 1: Trading and Merchandise**

Main terms: sserafim (abbreviation for "Le Sserafim", a K-pop group), le (a common word in K-pop discussions), fearless (song by Le Sserafim), wts (Want to Sell), lfb (Looking for Buyers), ph (Philippines), lesserafim (alternative spelling of Le Sserafim), hybe (HYBE Corporation, a K-pop entertainment company), pc (photocard, price count), insight (knowledge or understanding)

* **Instrumental Support**: wts (facilitating sales), lfb (facilitating purchases), ph (community localization), pc (merchandise)
* **Informational Support**: hybe (industry information), insight (strategic discussions)
* **Emotional Support**: fearless (song with emotional resonance), lesserafim (fan identity), sserafim (fan identity), le (common discussion term), pc (personal collectibles)

This topic revolves around trading and merchandise activities within the K-pop community. Terms like "wts" and "lfb" indicate buying and selling activities, while "hybe" and "insight" suggest informational support related to these transactions.

**Topic 2: Fandom and Artist Support**

Main terms: lesserafim (K-pop group), hybe (HYBE Corporation), garam (a member of Le Sserafim), le (common word), sserafim (abbreviation for Le Sserafim), just (common expression), love (affection), im (common word), bts (another K-pop group under HYBE), imlesserafim (fan tag or identifier)

* **Emotional Support**: love (expressing affection), just (emotional expression), im (fan identity)
* **Informational Support**: hybe (industry information), lesserafim (group information), sserafim (group information), le (common discussion term), garam (member information), imlesserafim (fan identity), bts (group information)

This topic focuses on fan communities and their support for artists. Terms like "love" and "just" reflect emotional support, while "hybe", "lesserafim", and "bts" indicate informational support related to the artists.

**Topic 3: Member and Group Dynamics**

Main terms: garam (a member of Le Sserafim), hybe (HYBE Corporation), ld (likely abbreviation), can (common word), jake (member of Enhypen), enhypen (another K-pop group under HYBE), just (common expression), member (group member), even (common word), think (common word)

* **Emotional Support**: just (emotional expression), even (common expression), think (emotional reflection)
* **Informational Support**: hybe (industry information), garam (member information), ld (likely abbreviation), can (common word), jake (member information), enhypen (group information), member (group dynamics)

This topic deals with the dynamics within K-pop groups and their members. Emotional support is seen in terms like "just", "even", and "think", while informational support is reflected in "hybe", "garam", "enhypen", and the names of specific members.

**Topic 4: Music and Chart Performance**

Main terms: melon (Korean music chart), lesserafim (K-pop group), fearless (song by Le Sserafim), hybe (HYBE Corporation), taehyung (member of BTS), bug (common word), genie (Korean music chart), garam (member of Le Sserafim), flo (Korean music chart), uls (likely abbreviation)

* **Emotional Support**: taehyung (emotional connection to a BTS member), fearless (song with emotional resonance), lesserafim (group with emotional significance)
* **Informational Support**: hybe (industry information), melon (music chart information), bug (common word), genie (music chart information), flo (music chart information), uls (likely abbreviation), garam (member information)

This topic is about the music and chart performance of K-pop artists. Emotional support is seen in terms like "taehyung" and "fearless", while informational support is represented by music charts and streaming services like "melon", "bug", and "genie".

A screenshot of a computer screen

Description automatically generated

Case 3: When Topics =3:

**Topic 0: Controversies and Community Discussions**

* **Main Terms:** hybe, garam, just, people, even, said, victim, like, group, taehyung
* **Likely Focus:** This topic revolves around controversies and community discussions, possibly involving issues related to HYBE, individuals (like Taehyung), and community responses or reactions ("said," "victim").
* **Support Indicators:**
  + **Emotional Support:** garam, taehyung (discussion or support for individuals)
  + **Informational Support:** hybe, people, group (information sharing or discussions about the company and community)
  + **Appraisal Support:** even, said, victim (evaluations or opinions on events or situations)

**Topic 1: LE SSERAFIM and Music Promotion**

* **Main Terms:** sserafim, fearless, lesserafim, le, garam, week, chart, hybe, love, ive
* **Likely Focus:** This topic focuses on the K-pop group LE SSERAFIM, their music ("Fearless"), promotion activities (week, chart), and community sentiment (love, ive).
* **Support Indicators:**
  + **Emotional Support:** fearless, lesserafim, love (enthusiasm or support for the group and their music)
  + **Informational Support:** sserafim, le, week, chart (information about the group's activities and music performance)
  + **Appraisal Support:** garam, ive (evaluations or opinions about specific aspects related to the group)

**Topic 2: Trading and Activities**

* **Main Terms:** wts, lesserafim, lfb, hybe, ph, le, sserafim, pc, fearless, insight
* **Likely Focus:** This topic centers around fan trading activities and interactions within the K-pop community, including terms like "Want to Sell" (WTS), "Looking for Buy" (LFB), and fan engagement with merchandise (pc, ph).
* **Support Indicators:**
  + **Instrumental Support:** wts, lfb, pc, ph (facilitating fan trading activities)
  + **Informational Support:** hybe, lesserafim, le, sserafim, insight (providing information about the group and fan activities)
  + **Emotional Support:** fearless (enthusiasm or support for the group's merchandise and activities) A screenshot of a computer

    Description automatically generated

Results from LSA (Latent semantic analysis):

Case 1: When Topics = 4:

**Topic 0: LE SSERAFIM and Music Shows**

* **Main Terms:** lesserafim (alternative spelling of LE SSERAFIM), sserafim (abbreviation for LE SSERAFIM), le (common word in K-pop discussions), fearless (song by LE SSERAFIM), kazuha (member of LE SSERAFIM), imlesserafim (fan tag or identifier), melon (South Korean music streaming service), sakura (member of LE SSERAFIM), music bank (South Korean music TV program)
* **Types of Support:**
  + **Emotional Support:** fearless, kazuha, sakura, imlesserafim (fan tags and support for the members and song)
  + **Informational Support:** lesserafim, sserafim, le, melon, music bank (providing information about the group, their music, and performances)
  + **Instrumental Support:** music bank (platform for live performances and promotion)
* **Description:** This topic revolves around the K-pop girl group LE SSERAFIM, focusing on their members (Kazuha, Sakura), their song "Fearless," and their appearances on music shows like "Music Bank." It includes fan engagement through hashtags and mentions of the Melon music platform.

**Topic 1: Music Charts and Rankings**

* **Main Terms:** melon (South Korean music streaming service), bug (music streaming platform), genie (South Korean music streaming service), flo (South Korean music streaming service), uls (Unique Listeners), kst (Korea Standard Time), peak (highest position on music charts), fearless (song by LE SSERAFIM), chart (ranking of songs or albums), new (new releases)
* **Types of Support:**
  + **Informational Support:** melon, bug, genie, flo, uls, kst, peak, chart, new (providing updates on chart performances and rankings)
  + **Emotional Support:** fearless (enthusiasm for the song's performance)
* **Description:** This topic focuses on music charts and rankings on different platforms (Melon, Genie, Flo), specific metrics (Unique Listeners, peak positions), and the performance of the song "Fearless." It involves tracking new entries and updates in the charts.

**Topic 2: Trading and Fan Activities**

* **Main Terms:** wts (Want to Sell), lfb (Looking for Buy), ph (Philippines or physical copies), melon (South Korean music streaming service), hybe (HYBE Corporation), pc (photocard), insight (information or understanding), onhand (items available or in possession), enhypen (another K-pop group), bug (music streaming platform)
* **Types of Support:**
  + **Instrumental Support:** wts, lfb, onhand (terms used in trading communities)
  + **Informational Support:** melon, hybe, pc, insight, enhypen, bug (providing information about products, trades, and other groups)
* **Description:** This topic is related to fan trading and activities. Terms like "Want to Sell" (WTS), "Looking for Buy" (LFB), and "onhand" are common in fan trading communities. It also references the Melon platform, HYBE Corporation, and another K-pop group, Enhypen, indicating a broad interest in fan interactions and trading within the community.

**Topic 3: Music Releases and Platforms**

* **Main Terms:** kazuha (member of LE SSERAFIM), arrival (new release or arrival of music), preview (short sample or teaser), bank (likely referring to Music Bank), music (general term for songs or albums), melon (South Korean music streaming service), imlesserafim (fan tag or identifier), bug (music streaming platform), genie (South Korean music streaming service), flo (South Korean music streaming service)
* **Types of Support:**
  + **Informational Support:** arrival, preview, bank, music, melon, bug, genie, flo (providing updates on new releases and where to find them)
  + **Emotional Support:** kazuha, imlesserafim (fan tags and excitement for releases)
* **Description:** This topic centers on music releases and previews, particularly involving Kazuha from LE SSERAFIM. It mentions various music platforms (Melon, Genie, Flo) and music shows (Music Bank), indicating interest in how new releases are promoted and distributed. Fans express anticipation and excitement through hashtags and previews.

Case 2: When Topics = 3:

**Topic 0:**

* **Main Terms:** lesserafim, sserafim, le, fearless, kazuha, imlesserafim, melon, sakura, music bank
* **Likely Focus:** This topic appears to be centered around the K-pop group LE SSERAFIM and their activities. It includes terms related to the group members (Kazuha, Sakura), their music ("Fearless"), and appearances on music shows like "Music Bank."
* **Support Indicators:**
  + **Emotional Support:** fearless, kazuha, imlesserafim, sakura (emotional attachment and support for the group and its members)
  + **Informational Support:** lesserafim, sserafim, le, melon, music bank (providing information about the group, their music, and performances)
  + **Instrumental Support:** music bank (platform for performances and promotional activities)

**Topic 1:**

* **Main Terms:** melon, bug, genie, flo, uls, kst, peak, fearless, chart, new
* **Likely Focus:** This topic focuses on music charts and streaming platforms. It includes terms related to music streaming services (Melon, Genie, Flo), metrics (Unique Listeners, Korea Standard Time), and terms indicating chart performance ("peak," "chart").
* **Support Indicators:**
  + **Informational Support:** melon, bug, genie, flo, uls, kst, peak, chart, new (providing updates and metrics related to music chart performances)
  + **Emotional Support:** fearless (enthusiasm or support for a particular song or artist)

**Topic 2:**

* **Main Terms:** wts, lfb, ph, melon, hybe, pc, insight, onhand, enhypen, bug
* **Likely Focus:** This topic appears to be related to fan activities and trading within the K-pop community. It includes terms like "Want to Sell" (WTS), "Looking for Buy" (LFB), and references to merchandise (pc, onhand) and another K-pop group (Enhypen).
* **Support Indicators:**
  + **Instrumental Support:** wts, lfb, pc, onhand (terms used in trading and selling activities)
  + **Informational Support:** melon, hybe, insight, enhypen, bug (providing information about platforms, groups, and merchandise)