



## HANGZHOU ASIAN GAMES 2023: A BIG DATA ANALYSIS

**Namkil Kang**

Far East University, South Korea

The ultimate goal of this paper is to analyze 26 articles of Google written from 2022 to 2023 regarding Hangzhou Asian Games 2023. A point to note is that the five-word sentence was the most widely used (163 tokens), followed by the six-word sentence (153 tokens), the seven-word sentence (151 tokens), the eight-word sentence (148 tokens), and the four-word sentence (138 tokens), in that order. A further point to note is that in 26 articles of Google, the use of common nouns is 25.4% higher than that of proper nouns. A major point of this paper is that topic 11 was the most occurred one, followed by topic 8 (topic 9), topic 15, and topic 12, in descending order. With respect to the frequency result of key nouns, it is worthwhile noting that the key word *Games* was the most widely used (168 tokens), followed by the word *Hangzhou*, the word *athlete*, the word *event* (the word *Asian*), and the words *sport* and *China*, in that order. When it comes to n-cliques, they refer to the same group that allows two stage links among nodes. Many similar keywords form cohesive groups, depending on two stage links. Finally, a giant component, the core part of the whole networks, is provided to capture a close relationship among major keywords that occurred in 26 articles of Google. Quite interestingly, the words *Hangzhou*, *Asian Games*, *venue*, *competition*, etc. are linked to several other nouns that are closely related to one another.

**Keywords:** Hangzhou Asian Games 2023, topic, keyword, n-clique, Google, giant component

### 1. Introduction

The main purpose of this paper is to analyze 26 articles of Google written from 2022 to 2023 regarding Hangzhou Asian Games 2023. This study was conducted by the software package NetMiner. First, we aim to contemplate the frequency result of nouns and their proportion. Second, we aim at going over the frequency result of common nouns and proper nouns. Third, we probe into 17 topics that constitute 26 articles and their keywords. Also, we aim at inquiring into the use of 17 topics in 26 articles of Google. Fourth, we contemplate the frequency result of 35 key nouns that were used in 26 articles of Google. Fifth, we aim to observe n-cliques that refer to two stage links among nodes. We obtained 386 n-cliques, but we included 50 n-cliques for the reason of space. Words that occur within two stage links belong to the same group. Sixth, we obtained a giant component that is a set of nodes that are continuously linked. The so-called giant component refers to a lump.

### 2. Results

#### 2.1. Frequency result of nouns

The goal of this section is to consider the word formation of nouns that were used in 26 articles. Table 1 shows the word formation of nouns that occurred in 26 articles:

**Table 1 Frequency result of nouns**

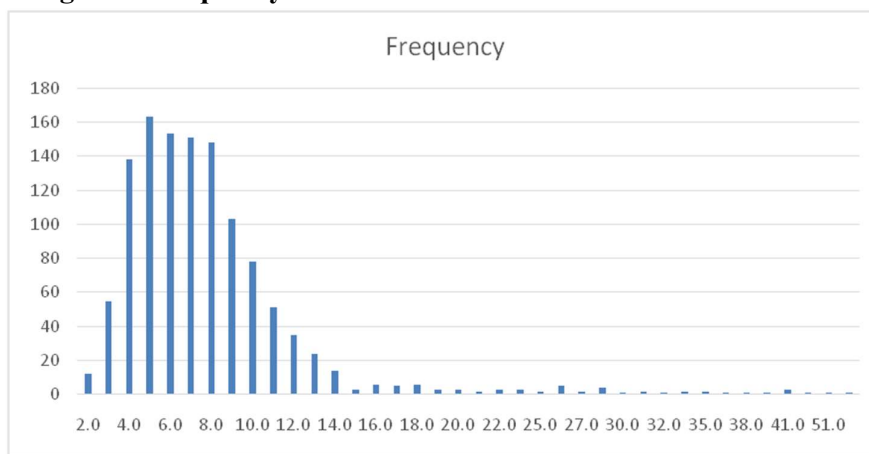
<b>Value</b>	<b>Frequency</b>	<b>Proportion</b>	<b>Cumulative Proportion</b>
2.0	12	0.01	0.01
3.0	55	0.046	0.056
4.0	138	0.116	0.172
5.0	163	0.137	0.31
6.0	153	0.129	0.438
7.0	151	0.127	0.565
8.0	148	0.124	0.69
9.0	103	0.087	0.776
10.0	78	0.066	0.842
11.0	51	0.043	0.885
12.0	35	0.029	0.914
13.0	24	0.02	0.934
14.0	14	0.012	0.946
15.0	3	0.003	0.949
16.0	6	0.005	0.954
17.0	5	0.004	0.958
18.0	6	0.005	0.963
19.0	3	0.003	0.966
20.0	3	0.003	0.968
21.0	2	0.002	0.97
22.0	3	0.003	0.972
23.0	3	0.003	0.975
25.0	2	0.002	0.976
26.0	5	0.004	0.981
27.0	2	0.002	0.982
29.0	4	0.003	0.986
30.0	1	0.001	0.987
31.0	2	0.002	0.988
32.0	1	0.001	0.989
34.0	2	0.002	0.991

35.0	2	0.002	0.992
36.0	1	0.001	0.993
38.0	1	0.001	0.994
40.0	1	0.001	0.995
41.0	3	0.003	0.997
49.0	1	0.001	0.998
51.0	1	0.001	0.999
52.0	1	0.001	1
Total	1189	1	

It is interesting to note that the five-word sentence obtained 163 tokens (the highest use and the highest proportion). More specifically, it occurred 163 times in 26 articles of Google. Its use is 163 tokens and its proportion is 0.137. It would be unfair not to point out that the six-word sentence obtained 153 tokens. Simply put, it occurred 153 times (the second highest). Note that the six-word sentence is followed by the seven-word sentence. The latter occurred 151 times (151 tokens) in 26 articles of Google (the third highest). It must be stressed that the eight-word sentence obtained 148 tokens in 26 articles of Google. That is to say, it appeared 148 times in 26 articles (the fourth highest). Finally, what is interesting about the four-word sentence is that it obtained 138 tokens. That is, it occurred 138 times in 26 articles of Google. We thus conclude that the five-word sentence was the most widely used (163 tokens).

The following graph shows the frequency result of nouns that were used in 26 articles of Google. As illustrated in Figure 1, the five-word sentence was the most widely used (163 tokens), followed by the six-word sentence (153 tokens), the seven-word sentence (151 tokens), the eight-word sentence (148 tokens), and the four-word sentence (138 tokens), in that order:

**Figure 1 Frequency result of nouns**



**2.2. Frequency result of common nouns and proper nouns**

This section is devoted to considering the frequency result of common nouns and proper nouns:

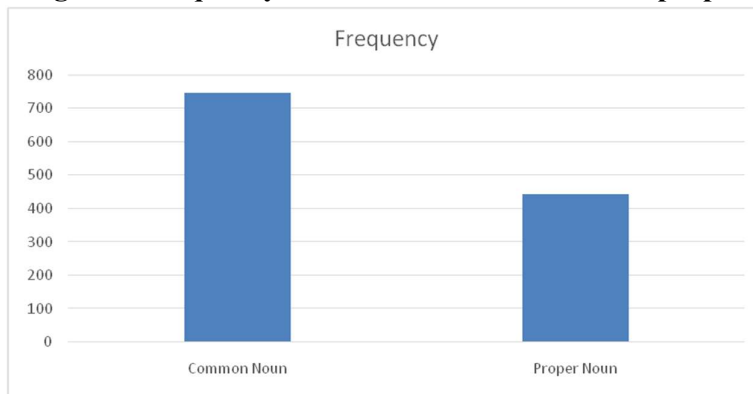
**Table 2 Use of nouns**

Value	Frequency	Proportion	Cumulative Proportion
<b>Common Noun</b>	746	0.627	0.627
<b>Proper Noun</b>	443	0.373	1
<b>Total</b>	1189	1	

It is worthwhile noting that common nouns had 746 tokens. To be more specific, they occurred 746 times (746 tokens) that account for 62.7%. On the other hand, in the case of proper nouns, they appeared 443 times (443 tokens) that account for 37.3%. We thus conclude that the use of common nouns is 25.4% higher than that of proper nouns.

The following graph shows the frequency result of common nouns and proper nouns that occurred in 26 articles of Google. As indicated in Figure 2, the use of common nouns is 746 tokens (62.7%), while that of proper nouns is 443 tokens (37.3%):

**Figure 2 Frequency result of common nouns and proper nouns**



### 2.3. 17 topics and their keywords

In section 2.3, we explore 17 topics that were used in 26 articles and their keywords. Table 3 shows 17 topics and keywords constituting them:

**Table 3 Topics**

	1st Keyword	2nd Keyword	3rd Keyword	4th Keyword	5th Keyword
<b>Topic-1</b>	Games	city	China	sport	Hangzhou
<b>Topic-2</b>	medal	event	China	Games	gold
<b>Topic-3</b>	year	country	event	team	Games
<b>Topic-4</b>	Games	athlete	medal	China	event

<b>Topic-5</b>	event	IOC	OCA	sport	Asia
<b>Topic-6</b>	athlete	China	sport	country	game
<b>Topic-7</b>	athlete	country	Asia	Games	ceremony
<b>Topic-8</b>	Games	Asian	Hangzhou	event	HAGOC
<b>Topic-9</b>	September	Games	Hangzhou	place	October
<b>Topic-10</b>	event	Asia	Asian	competition	China
<b>Topic-11</b>	venue	competition	team	event	Asian
<b>Topic-12</b>	sport	Asian	Hangzhou	China	Games
<b>Topic-13</b>	Hangzhou	Games	China	event	Asian
<b>Topic-14</b>	Games	Hangzhou	athlete	year	event
<b>Topic-15</b>	OCA	date	stakeholder	Chinese	Olympic Committee
<b>Topic-16</b>	athlete	Asian	Games	Asia	Hangzhou
<b>Topic-17</b>	Games	competition	year	athlete	HAGOC

It is noteworthy that the keywords *Games*, *city*, *China*, *sport*, and *Hangzhou* consist of topic 1. The fifth topic *Hangzhou* is the venue of the 2023 Asian Games. It is worth mentioning that the keywords *event*, *IOC*, *OCA*, *sport*, and *Asia* are made up of topic 5. As observed in Table 3, the word *event* was the most widely used in topic 5, thus counting as the most significant. Notice that topic 9 includes the keywords *September*, *Games*, *Hangzhou*, *place*, and *October*. The 2023 Asian Games last from 23<sup>rd</sup>September to 9<sup>th</sup> October and thus the keywords *September* and *October* were used as the first and fifth keywords. It is significant that topic 14 includes the keywords *Games*, *Hangzhou*, *athlete*, *year*, and *event*. As exemplified in Table 3, the word *athlete* was used as the third keyword, hence being deemed to be one of important games in the 23 Asian Games. Finally, it should be pointed out that topic 17 includes the keywords *Games*, *competition*, *year*, *athlete*, and *HAGOC*.

Now attention is paid to Table 4. Table 4 shows the frequency result of each topic:

**Table 4 Use of topics**

	Use of topics
<b>Topic-1</b>	21

<b>Topic-2</b>	22
<b>Topic-3</b>	14
<b>Topic-4</b>	13
<b>Topic-5</b>	19
<b>Topic-6</b>	11
<b>Topic-7</b>	21
<b>Topic-8</b>	35
<b>Topic-9</b>	35
<b>Topic-10</b>	17
<b>Topic-11</b>	51
<b>Topic-12</b>	30
<b>Topic-13</b>	16
<b>Topic-14</b>	19
<b>Topic-15</b>	31
<b>Topic-16</b>	11
<b>Topic-17</b>	9

Most importantly, topic 11 occurred 51 times in 26 articles of Google (the highest use). As indicated in Table 3, the keywords *venue*, *competition*, *team*, *event*, and *Asian* constitute topic 11. It should be noted that topic 11 is followed by topic 8 and topic 9. Topic 8 appeared 35 times in 26 articles (the second highest). Exactly the same can be said of topic 9 (the second highest). The keywords *Games*, *Asian*, *Hangzhou*, *event*, and *HAGOC* consist of topic 8. On the other hand, topic 9 includes the keywords *September*, *Games*, *Hangzhou*, *place*, and *October*. It must be emphasized that topic 15 occurred 31 times in 26 articles of Google (the fourth highest). Topic 15 includes the keywords *venue*, *competition*, *team*, *event*, and *Asian*. It is interesting that topic 12 turned up 30 times in 26 articles of Google (the fifth highest). Topic 12 includes the five keywords *sport*, *Asian*, *Hangzhou*, *China*, and *Games*. It therefore seems clear that topic 11 was the most occurred one, followed by topic 8 (topic 9), topic 15, and topic 12, in descending order. We thus conclude that topic 11 obtained 51 tokens (the highest use).

#### 2.4. Key nouns

This section focuses on investigating 35 key nouns that occurred in 26 articles of Google. Table 5 shows 35 key nouns that widely occurred in 26 articles:

**Table 5 Key nouns**

Number	Key words	Frequency
1	Games	168
2	Hangzhou	90
3	athlete	66
4	event	64
5	Asian	64
6	sport	46
7	China	46
8	venue	36
9	OCA	36
10	Asia	36
11	competition	35
12	september	35
13	year	34
14	country	26
15	city	26
16	Asian Games	24
17	team	23
18	place	20
19	medal	18
20	date	18
21	Olympic Council	17
22	October	17
23	game	16
24	stakeholder	14
25	person	14
26	e sports	14
27	ceremony	14
28	Olympic	14
29	IOC	14
30	Chinese	13
31	official	12
32	gold	12
33	India	12
34	HAGOC	12
35	edition	11

It is worth observing that as illustrated in Table 5, the key word *Games* occurred 168 times in 26 articles of Google. More specifically, it has the highest use (168 tokens). Put differently, it was the most widely used in 26 articles. It is worth noticing that the key word *Games* is

followed by the key word *HangZhou*. The latter turned up 90 times (the second highest) in 26 articles. This may be due to the fact that the venue of the 23 Asian Games is *Hangzhou*. It is worth saying that the word *athlete* occurred 66 times in 26 articles. This in turn indicates that the key word *athlete* counts as significant since it is one of important games in the 2023 Asian Games. It is vital that the word *event* appeared 64 times in 26 articles of Google. This is due to the fact that the 2023 Asian Games are the biggest event of Asia. It is more or less the same as the key word *Asian*. The word *Asian* turned up 64 times in 26 articles. Quite interestingly, the key words *sport* and *China* occurred 46 times in 26 articles (the sixth highest). It therefore seems reasonable to contend that the key word *Games* was the most widely used (168 tokens), followed by the word *Hangzhou*, the word *athlete*, the word *event* (the word *Asian*), and the words *sport* and *China*, in that order. More interestingly, the key word *Asian Games* appeared 24 times in 26 articles of Google. We thus conclude that the key word *Games* obtained the highest use (168 tokens) in 26 articles.

### 2.5. N-cliques

In this section, we aim at probing into n-cliques. The so-called n-clique refers to the same group that allows two stage links among nodes. We attempted to obtain 386 n-cliques, but we included 50 n-cliques for the reason of space. Nodes (words) within two stage links belong to the same group, called an n-clique. The 50 n-cliques show 50 groups that allow only two stage links:

**Table 6 Members of n-cliques**

N- CLIQUEs	MEMBERS
<b>n-Clique1</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Olympic, HAGOC, Paris, Para, Friday, competition, conflict, May, edition, game, medal, opening, pandemic, Jakarta, Guangzhou, schedule, team, torch, total, window
<b>n-Clique2</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Olympic, HAGOC, Paris, Committee
<b>n-Clique3</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Olympic, HAGOC, Olympic Committee, discussion, Committee
<b>n-Clique4</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Olympic, Asia, competition, game, medal, team, May, edition, Guangzhou, schedule, total



<b>n-Clique5</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Olympic, Asia, competition, game, medal, team, facility
<b>n-Clique6</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Olympic, Asia, Olympic Committee, discussion, facility, Committee
<b>n-Clique7</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Xinhua, Olympic Committee, Indonesia, Asia, discussion, China, facility, person, venue, Committee
<b>n-Clique8</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Indonesia, Asia, facility, venue, China, medal
<b>n-Clique9</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Indonesia, Asia, facility, venue, game, medal
<b>n-Clique10</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Indonesia, Asia, total, game, medal
<b>n-Clique11</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Indonesia, Friday, medal, game, Jakarta, total
<b>n-Clique12</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, Indonesia, Friday, medal, China
<b>n-Clique13</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, China, Asia, facility, venue, team, medal
<b>n-Clique14</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, China, Asia, Guangzhou, medal, team
<b>n-Clique15</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, China, Friday, medal, Guangzhou, team

<b>n- Clique16</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, venue, Asia, facility, team, game, medal, competition
<b>n- Clique17</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, venue, Asia, edition, competition, game, medal, schedule, team
<b>n- Clique18</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Ningbo, date, preparation, venue, Para, competition, edition, game, medal, schedule, team
<b>n- Clique19</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, game, competition, schedule, team, Asian Games, Guangzhou
<b>n- Clique20</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, game, competition, schedule, team, Asian Games, venue
<b>n- Clique21</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, game, competition, schedule, team, total, Guangzhou
<b>n- Clique22</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, game, Indonesia, total
<b>n- Clique23</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, game, Indonesia, venue
<b>n- Clique24</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, China, Asian Games, team, Guangzhou
<b>n- Clique25</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, China, Asian Games, team, venue
<b>n- Clique26</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Asia, China, Indonesia, venue
<b>n- Clique27</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Friday, game, competition, Guangzhou, schedule, team, Asian Games

<b>n- Clique28</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Friday, game, competition, Guangzhou, schedule, team, total
<b>n- Clique29</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Friday, game, Indonesia, total
<b>n- Clique30</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Friday, China, Guangzhou, Asian Games, team
<b>n- Clique31</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, official, medal, Friday, China, Indonesia
<b>n- Clique32</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Asian Games, medal, team, competition, edition, game, schedule, May, Guangzhou, Friday
<b>n- Clique33</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Asian Games, medal, team, competition, edition, game, schedule, May, Guangzhou, Asia
<b>n- Clique34</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, ceremony, place, Asian Games, medal, team, competition, edition, game, schedule, venue, Asia
<b>n- Clique35</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, game, competition, schedule, Asian Games, team, Guangzhou, official, e sports
<b>n- Clique36</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, game, competition, schedule, Asian Games, team, Guangzhou, May, edition
<b>n- Clique37</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, game, competition, schedule, Asian Games, team, venue, e sports, official
<b>n- Clique38</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, game, competition, schedule, Asian Games, team, venue, edition
<b>n- Clique39</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, game, Indonesia, official, venue

<b>n- Clique40</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, China, official, e sports, Asian Games, team, Guangzhou
<b>n- Clique41</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, China, official, e sports, Asian Games, team, venue
<b>n- Clique42</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Asia, China, official, Indonesia, venue
<b>n- Clique43</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, athlete, medal, Paris, Guangzhou, competition, edition, game, May, schedule, team
<b>n- Clique44</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, esports, Asia, medal, team, competition, game, schedule, Olympic, Guangzhou
<b>n- Clique45</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, esports, Asia, medal, team, competition, game, facility, Olympic
<b>n- Clique46</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, esports, Asia, medal, team, competition, game, facility, venue
<b>n- Clique47</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympics, city, esports, Asia, medal, team, China, facility, venue
<b>n- Clique48</b>	Games, Hangzhou, event, sport, Asian, year, September, October, Olympic Council, Asia, athlete, competition, game, official, Asian Games, team
<b>n- Clique49</b>	Games, Hangzhou, event, sport, Asian, year, September, October, esports, competition, esports, game, medal, team, schedule, Asian Games, venue, athlete, Asia
<b>n- Clique50</b>	Games, Hangzhou, event, sport, Asian, year, September, October, esports, competition, esports, game, medal, team, schedule, Asian Games, venue, match

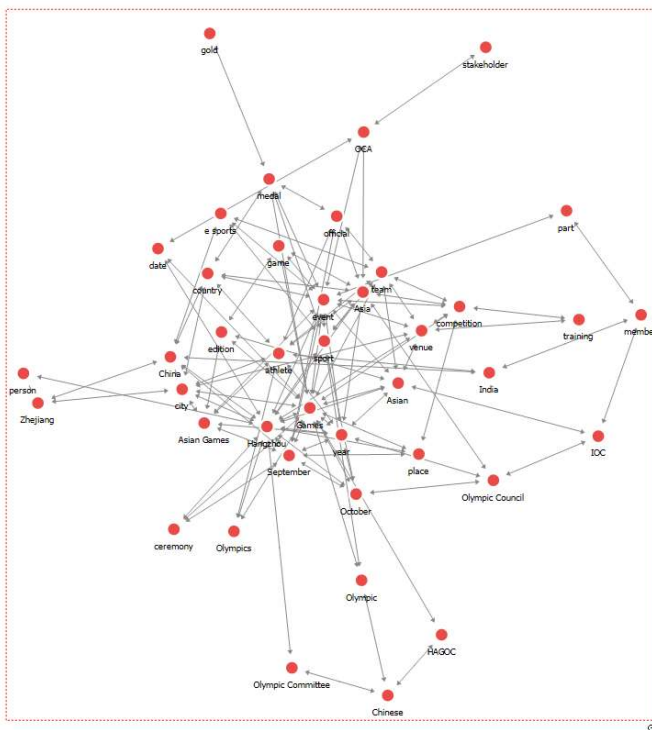
As illustrated in Table 6, 50 n-cliques form each group in which words that allow two stage links occur. It is worthwhile to consider n-clique 1. In this n-clique, the keywords *Games, Hangzhou, event, sport, Asian, year, September, October, city, ceremony, place*, etc. form a group, called n-clique 1. In this n-clique, keywords form a group within two stage links. That is to say, these keywords are ones closely related to one another. It is interesting to mention n-clique 10. In this n-clique, the keywords *Games, Hangzhou, event, sport, Asian, year, September, October, city, date, Asia, Ningbo, medal*, etc. form a group in which words allow only two stage links. It is appropriate to mention that n-clique 30 includes the keywords *Asian,*

*Games, team, China, Friday, medal, October, official, Guangzhou,* etc. These keywords are closely related to one another and thus they form a cohesive group, called n-clique 30. Finally, it is vital that the keywords *match, venue, Asian, Games, schedule, medal, team, competition, event, Hangzhou,* etc. form a cohesive group, called n-clique 50. The closely related keywords allow only two stage links among nodes and they form a cohesive group.

### 2.6. A giant component

In this section, we provide a giant component that refers to a set of nodes that are continuously linked. That is, we provide the map of a giant component:

**Figure 3** A giant component



This giant component is the core part of the whole networks. We eliminated the other components and included this giant component to capture a close relationship among major keywords that occurred in 26 articles of Google. Quite interestingly, the word *Hangzhou* is linked to the core words *venue, sport, event, athlete,* etc. More importantly, the word *Asian Games* is linked to the core nouns *Hangzhou, athlete, edition, and city.* It is interesting that the word *venue* is linked to the four nouns *Games, event, sport, and team.* On the other hand, the word *competition* is linked to the five nouns *training, team, event, Games, and venue.* To sum up, this giant component constitutes the core part that represents 26 articles of Google. The words *Hangzhou, Asian Games, venue, competition,* etc. are linked to several other nouns that are closely related to one another. We thus conclude that this giant component is the core part that constitutes 26 articles of Google. For the map of big data and similar words, see Kang (2023a, 2023b, 2023c, 2023d, 2023e, 2023f).

### 3. Conclusion

To sum up, we have analyzed 26 articles of Google written from 2022 to 2023 regarding Hangzhou Asian Games 2023. In section 2.1, we have argued that the five-word sentence was the most widely used (163 tokens), followed by the six-word sentence (153 tokens), the seven-word sentence (151 tokens), the eight-word sentence (148 tokens), and the four-word sentence (138 tokens), in that order. In section 2.2, we have further argued that in 26 articles of Google, the use of common nouns is 25.4% higher than that of proper nouns. In section 2.3, we have shown that topic 11 was the most occurred one, followed by topic 8 (topic 9), topic 15, and topic 12, in descending order. In section 2.4, we have contended that the key word *Games* was the most widely used (168 tokens), followed by the word *Hangzhou*, the word *athlete*, the word *event* (the word *Asian*), and the words *sport* and *China*, in that order. In section 2.5, we have explored 50 n-cliques. The so-called n-clique refers to the same group that allows two stage links among nodes. We attempted to obtain 386 n-cliques, but we included 50 n-cliques for the reason of space. In section 2.6, we have provided a giant component to capture a close relationship among major keywords that occurred in 26 articles of Google. Quite interestingly, the words *Hangzhou*, *Asian Games*, *venue*, *competition*, etc. are linked to several other nouns that are closely related to one another.

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