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Assignment 3 part 1:
Artcles taken: 101

query:  Heath Ledger
TF-IDF:
Time taken to make the search:
CPU times: user 20.2 ms, sys: 2.02 ms, total: 22.2 ms
Wall time: 22.2 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.09 s, sys: 12.1 ms, total: 1.1 s
Wall time: 1.09 s
Articles closest to given word ranked:
(1, ('Abraham Lincoln', 0.99999833))
(2, ('Lil Wayne', 0.99999833))
(3, ('Angelina Jolie', 0.99999833))
(4, ('Michael Jackson', 0.99999833))
(5, ('Breaking Bad', 0.99999833))
(6, ('Madonna', 0.99999833))
(7, ('Kobe Bryant', 0.99999833))
(8, ('September 11 attacks', 0.99999833))
(9, ('Donald Trump', 0.99999833))
(10, ('Lionel Messi', 0.99999833))
(11, ('Star Wars', 0.9999983))
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(12, ('United Kingdom', 0.9999982))
(13, ('World War II', 0.9999982))
(14, ('Sex', 0.99999815))
(15, ('Winston Churchill', 0.99999815))
(16, ('The Walking Dead (TV series)', 0.99999815))
(17, ('Vietnam War', 0.99999815))
(18, ('How I Met Your Mother', 0.9999981))
(19, ('LeBron James', 0.9999981))
(20, ('Periodic Table', 0.999998))

10 closest search terms to the query:
('manager', 0.99999833)
('cancer', 0.99999833)
('der', 0.99999833)
('inter', 0.9999983)
('mater', 0.9999983)
('debater', 0.9999982)
('weather', 0.9999982)
('beater', 0.9999982)
('water', 0.99999815)
('counter', 0.99999815)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 11
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 13
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 18
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 2
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 12
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 3
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 4
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 14
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 15
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 5

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James
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tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 19

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Ryan Reynolds
TF-IDF:
Time taken to make the search:
CPU times: user 38.3 ms, sys: 4.04 ms, total: 42.3 ms
Wall time: 37.9 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
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CPU times: user 1.17 s, sys: 35.7 ms, total: 1.21 s
Wall time: 1.18 s
Articles closest to given word ranked:
(1, ('Winston Churchill', 0.99994594))
(2, ('Lil Wayne', 0.9999458))
(3, ('LeBron James', 0.9999458))
(4, ('Kobe Bryant', 0.9999458))
(5, ('Lionel Messi', 0.9999458))
(6, ('Madonna', 0.9999456))
(7, ('Michael Jackson', 0.99994546))
(8, ('Sex', 0.99994546))
(9, ('The Walking Dead (TV series)', 0.99994546))
(10, ('Periodic Table', 0.99994546))
(11, ('World War II', 0.99994546))
(12, ('Star Wars', 0.99994546))
(13, ('Vietnam War', 0.99994504))
(14, ('Angelina Jolie', 0.999945))
(15, ('Breaking Bad', 0.999945))
(16, ('Donald Trump', 0.9999449))
(17, ('Abraham Lincoln', 0.99994457))
(18, ('How I Met Your Mother', 0.9999445))
(19, ('United Kingdom', 0.9999445))
(20, ('September 11 attacks', 0.9999445))

10 closest search terms to the query:
('marigold', 0.99994594)
('gold', 0.9999458)
('maverick', 0.9999456)
('similar', 0.99994546)
('percentage', 0.9999453)
('massive', 0.99994504)
('golden', 0.999945)
('singapore', 0.9999449)
('favorable', 0.9999449)
('filmmaker', 0.99994487)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 12
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 11
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 18
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 2
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 19
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 14
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 7
Article: Sex
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Rank in tf-idf: 8
Rank in Word2Vec: 8
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 1
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 15


Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 3

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Jennifer Lopez
TF-IDF:
Time taken to make the search:
CPU times: user 20.6 ms, sys: 2.03 ms, total: 22.7 ms
Wall time: 22.4 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')
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10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.06 s, sys: 8.86 ms, total: 1.07 s
Wall time: 1.07 s
Articles closest to given word ranked:
(1, ('How I Met Your Mother', 0.99997365))
(2, ('Madonna', 0.99997365))
(3, ('United Kingdom', 0.9999659))
(4, ('Sex', 0.9999659))
(5, ('Winston Churchill', 0.99996495))
(6, ('World War II', 0.99996495))
(7, ('Star Wars', 0.9999644))
(8, ('Abraham Lincoln', 0.99996424))
(9, ('Angelina Jolie', 0.99996424))
(10, ('Breaking Bad', 0.99996424))
(11, ('LeBron James', 0.99996424))
(12, ('The Walking Dead (TV series)', 0.99996424))
(13, ('September 11 attacks', 0.99996424))
(14, ('Donald Trump', 0.99996424))
(15, ('Periodic Table', 0.99996424))
(16, ('Lionel Messi', 0.99996424))
(17, ('Vietnam War', 0.99996424))
(18, ('Kobe Bryant', 0.9999638))
(19, ('Lil Wayne', 0.99996376))
(20, ('Michael Jackson', 0.9999637))

10 closest search terms to the query:
('jennifer', 0.99997365)
('conifer', 0.9999659)
('prelude', 0.99996495)
('isolder', 0.9999644)
('presence', 0.99996424)
('modern', 0.99996424)
('morally', 0.99996424)
('preserve', 0.9999641)
('presidency', 0.99996406)
('manhattan', 0.99996406)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 7
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 6
Article: How I Met Your Mother
Rank in tf-idf: 3
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Rank in Word2Vec: 1
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 19
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 3
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 9
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 20
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 4
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 5
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 10

Selected Algo: tf-idf
Article selected: LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 11

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Ronald Reagan
TF-IDF:
Time taken to make the search:
CPU times: user 32.8 ms, sys: 3.01 ms, total: 35.9 ms
Wall time: 36.3 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')

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(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.1 s, sys: 19 ms, total: 1.12 s
Wall time: 1.12 s
Articles closest to given word ranked:
(1, ('Michael Jackson', 0.9999974))
(2, ('September 11 attacks', 0.99999607))
(3, ('Donald Trump', 0.99999607))
(4, ('Kobe Bryant', 0.99999595))
(5, ('Lionel Messi', 0.99999595))
(6, ('Star Wars', 0.99999595))
(7, ('Angelina Jolie', 0.9999959))
(8, ('LeBron James', 0.9999959))
(9, ('Abraham Lincoln', 0.9999958))
(10, ('United Kingdom', 0.9999958))
(11, ('Sex', 0.9999958))
(12, ('Winston Churchill', 0.9999958))
(13, ('Madonna', 0.9999958))
(14, ('The Walking Dead (TV series)', 0.9999958))
(15, ('Vietnam War', 0.9999958))
(16, ('World War II', 0.9999958))
(17, ('Lil Wayne', 0.99999577))
(18, ('Breaking Bad', 0.99999565))
(19, ('How I Met Your Mother', 0.9999955))
(20, ('Periodic Table', 0.99999547))

10 closest search terms to the query:
('reagan', 0.9999974)
('congressional', 0.99999607)
('maternal', 0.99999595)
('mater', 0.99999595)
('professional', 0.9999959)
('remain', 0.9999958)
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('provisional', 0.9999958)
('reginald', 0.99999577)
('register', 0.99999577)
('resident', 0.99999577)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 6
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 16
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 19
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 17
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 10
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 7
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 1
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 11
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 12
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 18

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 8

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive
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query:  Sylvester Stallone
TF-IDF:
Time taken to make the search:
CPU times: user 24.2 ms, sys: 2.03 ms, total: 26.2 ms
Wall time: 25.5 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.08 s, sys: 15.1 ms, total: 1.09 s
Wall time: 1.08 s
Articles closest to given word ranked:
(1, ('Winston Churchill', 0.99999833))
(2, ('Donald Trump', 0.99999833))
(3, ('Abraham Lincoln', 0.9999983))
(4, ('Lil Wayne', 0.9999983))
(5, ('United Kingdom', 0.9999983))
(6, ('Angelina Jolie', 0.9999983))
(7, ('Michael Jackson', 0.9999983))
(8, ('Breaking Bad', 0.9999983))
(9, ('LeBron James', 0.9999983))
(10, ('Madonna', 0.9999983))
(11, ('The Walking Dead (TV series)', 0.9999983))
(12, ('Kobe Bryant', 0.9999983))
(13, ('September 11 attacks', 0.9999983))
(14, ('Periodic Table', 0.9999983))
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(15, ('Lionel Messi', 0.9999983))
(16, ('Vietnam War', 0.9999983))
(17, ('World War II', 0.9999983))
(18, ('Sex', 0.99999803))
(19, ('Star Wars', 0.99999803))
(20, ('How I Met Your Mother', 0.99999785))


10 closest search terms to the query:
('protester', 0.99999833)
('come', 0.9999983)
('recreational', 0.99999815)
('recover', 0.9999981)
('instance', 0.9999981)
('fester', 0.9999981)
('professionally', 0.99999803)
('content', 0.99999803)
('recently', 0.99999803)
('material', 0.99999803)


Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 19
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 17
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 20
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 4
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 5
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 6
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 7
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 18
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 1
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 8


Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James


tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 9
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10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Jennifer Lawrence
TF-IDF:
Time taken to make the search:
CPU times: user 19.5 ms, sys: 3.02 ms, total: 22.5 ms
Wall time: 22.6 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.08 s, sys: 11 ms, total: 1.09 s
Wall time: 1.08 s
Articles closest to given word ranked:
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(1, ('September 11 attacks', 0.99999815))
(2, ('United Kingdom', 0.9999981))
(3, ('Sex', 0.9999981))
(4, ('Winston Churchill', 0.9999981))
(5, ('Breaking Bad', 0.9999981))
(6, ('LeBron James', 0.9999981))
(7, ('The Walking Dead (TV series)', 0.9999981))
(8, ('Kobe Bryant', 0.9999981))
(9, ('Donald Trump', 0.9999981))
(10, ('Vietnam War', 0.9999981))
(11, ('World War II', 0.9999981))
(12, ('Star Wars', 0.9999981))
(13, ('Abraham Lincoln', 0.9999978))
(14, ('How I Met Your Mother', 0.99999774))
(15, ('Lil Wayne', 0.99999774))
(16, ('Angelina Jolie', 0.99999774))
(17, ('Michael Jackson', 0.99999774))
(18, ('Madonna', 0.99999774))
(19, ('Periodic Table', 0.99999774))
(20, ('Lionel Messi', 0.99999774))

10 closest search terms to the query:
('lawrence', 0.99999815)
('conference', 0.9999981)
('difference', 0.9999981)
('indifference', 0.9999978)
('reference', 0.99999774)
('residence', 0.99999774)
('presence', 0.9999977)
('preference', 0.9999977)
('conifer', 0.9999976)
('recurrence', 0.9999976)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 12
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 11
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 14
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 15
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 2
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 16
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 17
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 3
Article: Winston Churchill
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Rank in tf-idf: 9
Rank in Word2Vec: 4
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 5

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 6

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Mahatma Gandhi
TF-IDF:
Time taken to make the search:
CPU times: user 21.7 ms, sys: 2.01 ms, total: 23.8 ms
Wall time: 23.8 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
```

```
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.08 s, sys: 29.2 ms, total: 1.1 s
Wall time: 1.09 s
Articles closest to given word ranked:
(1, ('Winston Churchill', 0.9999811))
(2, ('Michael Jackson', 0.9999744))
(3, ('Abraham Lincoln', 0.9999743))
(4, ('LeBron James', 0.99997425))
(5, ('Star Wars', 0.9999742))
(6, ('Vietnam War', 0.99997413))
(7, ('Lil Wayne', 0.9999741))
(8, ('United Kingdom', 0.9999741))
(9, ('Angelina Jolie', 0.9999741))
(10, ('Sex', 0.9999741))
(11, ('The Walking Dead (TV series)', 0.9999741))
(12, ('Kobe Bryant', 0.9999741))
(13, ('September 11 attacks', 0.9999741))
(14, ('Donald Trump', 0.9999741))
(15, ('World War II', 0.9999741))
(16, ('Breaking Bad', 0.99997395))
(17, ('Madonna', 0.99997395))
(18, ('Lionel Messi', 0.9999739))
(19, ('Periodic Table', 0.99997383))
(20, ('How I Met Your Mother', 0.9999736))

10 closest search terms to the query:
('gandhi', 0.9999811)
('primal', 0.9999744)
('landowner', 0.9999743)
('undefeated', 0.99997425)
('publisher', 0.9999742)
('contentious', 0.99997413)
('landlord', 0.99997413)
('land', 0.9999741)
('primary', 0.9999741)
('landing', 0.9999741)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 5
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 15
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 20
Article: Lil Wayne
Rank in tf-idf: 4
```

```
Rank in Word2Vec: 7
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 8
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 9
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 2
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 10
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 1
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 16

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 4

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Emma Watson
TF-IDF:
Time taken to make the search:
CPU times: user 22.1 ms, sys: 2.02 ms, total: 24.1 ms
Wall time: 24.2 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
```

```
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.05 s, sys: 6.61 ms, total: 1.06 s
Wall time: 1.06 s
Articles closest to given word ranked:
(1, ('Abraham Lincoln', 0.9999982))
(2, ('How I Met Your Mother', 0.9999982))
(3, ('Lil Wayne', 0.9999982))
(4, ('Breaking Bad', 0.9999982))
(5, ('LeBron James', 0.9999982))
(6, ('The Walking Dead (TV series)', 0.9999982))
(7, ('Kobe Bryant', 0.9999982))
(8, ('Donald Trump', 0.9999982))
(9, ('Star Wars', 0.9999982))
(10, ('World War II', 0.99999756))
(11, ('Angelina Jolie', 0.99999744))
(12, ('Winston Churchill', 0.99999744))
(13, ('September 11 attacks', 0.99999744))
(14, ('Periodic Table', 0.99999744))
(15, ('Vietnam War', 0.99999744))
(16, ('Madonna', 0.99999726))
(17, ('Michael Jackson', 0.99999714))
(18, ('Lionel Messi', 0.999997))
(19, ('United Kingdom', 0.99999696))
(20, ('Sex', 0.99999684))

10 closest search terms to the query:
('son', 0.9999982)
('ron', 0.99999756)
('matteson', 0.9999975)
('reason', 0.99999744)
('stinson', 0.9999974)
('jason', 0.9999973)
('person', 0.9999973)
('nelson', 0.99999726)
('lesson', 0.99999726)
```

```
('wilson', 0.99999726)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 9
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 10
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 2
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 3
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 19
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 11
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 17
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 20
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 12
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 4

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 5

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  John Lennon
TF-IDF:
Time taken to make the search:
```

```
CPU times: user 23.2 ms, sys: 2.03 ms, total: 25.3 ms
Wall time: 25.4 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.09 s, sys: 11.7 ms, total: 1.1 s
Wall time: 1.1 s
Articles closest to given word ranked:
(1, ('Lil Wayne', 0.99999607))
(2, ('Abraham Lincoln', 0.999996))
(3, ('How I Met Your Mother', 0.999996))
(4, ('Angelina Jolie', 0.999996))
(5, ('Michael Jackson', 0.999996))
(6, ('Sex', 0.999996))
(7, ('Winston Churchill', 0.999996))
(8, ('Kobe Bryant', 0.999996))
(9, ('Donald Trump', 0.999996))
(10, ('Vietnam War', 0.999996))
(11, ('World War II', 0.999996))
(12, ('Star Wars', 0.999996))
(13, ('Periodic Table', 0.99999565))
(14, ('Breaking Bad', 0.9999954))
(15, ('LeBron James', 0.9999954))
(16, ('The Walking Dead (TV series)', 0.9999954))
(17, ('United Kingdom', 0.99999523))
```

```
(18, ('Madonna', 0.99999523))
(19, ('Lionel Messi', 0.99999523))
(20, ('September 11 attacks', 0.9999951))

10 closest search terms to the query:
('shannon', 0.99999607)
('non', 0.999996)
('cannon', 0.999996)
('bannon', 0.9999957)
('ron', 0.9999957)
('ion', 0.99999565)
('gon', 0.9999956)
('son', 0.9999954)
('dion', 0.9999954)
('ambition', 0.99999523)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 12
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 11
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 3
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 1
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 17
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 4
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 5
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 6
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 7
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 14

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 15

10 Closest Search terms using tf-idf of the selected article:
1 junior
```

```
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Robin Williams
TF-IDF:
Time taken to make the search:
CPU times: user 20.3 ms, sys: 2 ms, total: 22.3 ms
Wall time: 22.4 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.06 s, sys: 6.62 ms, total: 1.07 s
Wall time: 1.08 s
Articles closest to given word ranked:
(1, ('Lil Wayne', 0.9999952))
(2, ('LeBron James', 0.9999952))
(3, ('September 11 attacks', 0.9999952))
```

```
(4, ('Star Wars', 0.9999952))
(5, ('Abraham Lincoln', 0.9999912))
(6, ('Vietnam War', 0.9999912))
(7, ('The Walking Dead (TV series)', 0.9999904))
(8, ('Madonna', 0.99998975))
(9, ('Donald Trump', 0.99998975))
(10, ('Lionel Messi', 0.99998975))
(11, ('Angelina Jolie', 0.9999896))
(12, ('Winston Churchill', 0.9999896))
(13, ('Michael Jackson', 0.99998945))
(14, ('Periodic Table', 0.99998945))
(15, ('Breaking Bad', 0.99998933))
(16, ('Sex', 0.9999892))
(17, ('United Kingdom', 0.999989))
(18, ('Kobe Bryant', 0.999989))
(19, ('World War II', 0.9999889))
(20, ('How I Met Your Mother', 0.9999888))

10 closest search terms to the query:
('williams', 0.9999952)
('william', 0.9999912)
('gilliam', 0.9999904)
('billion', 0.99998975)
('willing', 0.9999896)
('contribution', 0.99998945)
('billionth', 0.99998945)
('constantly', 0.99998933)
('participation', 0.99998933)
('nationwide', 0.99998933)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 4
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 19
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 20
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 1
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 17
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 11
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 13
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 16
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 12
Article: Breaking Bad
```

```
Rank in tf-idf: 10
Rank in Word2Vec: 15

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 2

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Mark Wahlberg
TF-IDF:
Time taken to make the search:
CPU times: user 21.9 ms, sys: 3 ms, total: 24.9 ms
Wall time: 24.9 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
```

```
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.06 s, sys: 10.8 ms, total: 1.07 s
Wall time: 1.07 s
Articles closest to given word ranked:
(1, ('Angelina Jolie', 0.9999742))
(2, ('September 11 attacks', 0.9999735))
(3, ('Donald Trump', 0.999973))
(4, ('Abraham Lincoln', 0.99997294))
(5, ('Star Wars', 0.9999729))
(6, ('How I Met Your Mother', 0.99997264))
(7, ('Lil Wayne', 0.99997264))
(8, ('United Kingdom', 0.99997264))
(9, ('Winston Churchill', 0.99997264))
(10, ('Breaking Bad', 0.99997264))
(11, ('Kobe Bryant', 0.99997264))
(12, ('Vietnam War', 0.9999726))
(13, ('Madonna', 0.9999725))
(14, ('The Walking Dead (TV series)', 0.9999725))
(15, ('Lionel Messi', 0.9999725))
(16, ('World War II', 0.9999725))
(17, ('LeBron James', 0.99997246))
(18, ('Michael Jackson', 0.9999724))
(19, ('Sex', 0.9999724))
(20, ('Periodic Table', 0.9999719))

10 closest search terms to the query:
('strasberg', 0.9999742)
('proven', 0.9999735)
('pastor', 0.999973)
('stark', 0.99997294)
('lightsaber', 0.9999729)
('funeral', 0.99997264)
('greenberg', 0.99997264)
('commence', 0.99997264)
('province', 0.9999726)
('serial', 0.9999726)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 5
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 16
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 6
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 7
Article: United Kingdom
Rank in tf-idf: 5
```

Rank in Word2Vec: 8
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 1
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 18
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 19
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 9
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 10

Selected Algo: tf-idf
Article selected: LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 17

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Nelson Mandela
TF-IDF:
Time taken to make the search:
CPU times: user 21 ms, sys: 2.02 ms, total: 23 ms
Wall time: 22.8 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')

```
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.07 s, sys: 8.88 ms, total: 1.08 s
Wall time: 1.07 s
Articles closest to given word ranked:
(1, ('Angelina Jolie', 0.99999434))
(2, ('Winston Churchill', 0.99999434))
(3, ('Vietnam War', 0.9999942))
(4, ('Breaking Bad', 0.99999416))
(5, ('Donald Trump', 0.99999416))
(6, ('The Walking Dead (TV series)', 0.9999941))
(7, ('Star Wars', 0.9999941))
(8, ('How I Met Your Mother', 0.99999404))
(9, ('LeBron James', 0.99999404))
(10, ('Kobe Bryant', 0.99999404))
(11, ('Lionel Messi', 0.9999939))
(12, ('World War II', 0.9999939))
(13, ('Lil Wayne', 0.99999386))
(14, ('United Kingdom', 0.99999386))
(15, ('Michael Jackson', 0.99999386))
(16, ('Madonna', 0.99999386))
(17, ('Abraham Lincoln', 0.9999938))
(18, ('September 11 attacks', 0.9999938))
(19, ('Sex', 0.9999936))
(20, ('Periodic Table', 0.99999356))

10 closest search terms to the query:
('wander', 0.99999434)
('clandestinely', 0.99999434)
('alexander', 0.9999943)
('commander', 0.9999942)
('nelson', 0.99999416)
('pander', 0.99999416)
('anderson', 0.9999941)
('contestant', 0.9999941)
('contender', 0.99999404)
('controversially', 0.999994)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
```

```
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 7
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 12
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 8
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 13
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 14
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 1
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 15
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 19
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 2
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 4

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 9

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Demi Lovato
TF-IDF:
Time taken to make the search:
CPU times: user 21.8 ms, sys: 2.04 ms, total: 23.9 ms
Wall time: 23.4 ms
```

```
Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.07 s, sys: 17.1 ms, total: 1.09 s
Wall time: 1.08 s
Articles closest to given word ranked:
(1, ('Winston Churchill', 0.99995166))
(2, ('World War II', 0.99995166))
(3, ('Abraham Lincoln', 0.9999512))
(4, ('Donald Trump', 0.9999512))
(5, ('Vietnam War', 0.9999512))
(6, ('How I Met Your Mother', 0.9999508))
(7, ('Lil Wayne', 0.9999508))
(8, ('Michael Jackson', 0.9999508))
(9, ('Breaking Bad', 0.9999508))
(10, ('LeBron James', 0.9999508))
(11, ('The Walking Dead (TV series)', 0.9999508))
(12, ('September 11 attacks', 0.9999508))
(13, ('Periodic Table', 0.9999508))
(14, ('Star Wars', 0.9999508))
(15, ('United Kingdom', 0.99995005))
(16, ('Kobe Bryant', 0.99995005))
(17, ('Lionel Messi', 0.99995))
(18, ('Sex', 0.9999499))
(19, ('Angelina Jolie', 0.99994916))
(20, ('Madonna', 0.99994916))
```

```
10 closest search terms to the query:
('pact', 0.99995166)
('proposal', 0.9999512)
('base', 0.9999508)
('propose', 0.9999505)
('proposed', 0.99995047)
('renovate', 0.99995023)
('uncle', 0.9999501)
('franchise', 0.99995005)
('deputy', 0.99995005)
('profile', 0.99995)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 14
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 2
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 6
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 7
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 15
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 19
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 8
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 18
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 1
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 9

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 10

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
```

```
    5 clinch
    6 break
    7 strange
    8 foul
    9 lando
   10 alive


query:  Megan Fox
TF-IDF:
Time taken to make the search:
CPU times: user 20.7 ms, sys: 3.02 ms, total: 23.7 ms
Wall time: 23.5 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.07 s, sys: 16.9 ms, total: 1.08 s
Wall time: 1.08 s
Articles closest to given word ranked:
(1, ('The Walking Dead (TV series)', 0.99995667))
(2, ('How I Met Your Mother', 0.9999555))
(3, ('Kobe Bryant', 0.9999525))
(4, ('Abraham Lincoln', 0.99995166))
(5, ('Madonna', 0.99995166))
(6, ('Donald Trump', 0.99995166))
```

```
(7, ('Winston Churchill', 0.9999511))
(8, ('United Kingdom', 0.99995095))
(9, ('September 11 attacks', 0.99995095))
(10, ('Lionel Messi', 0.9999508))
(11, ('Vietnam War', 0.9999508))
(12, ('Lil Wayne', 0.9999507))
(13, ('World War II', 0.9999507))
(14, ('Breaking Bad', 0.9999506))
(15, ('Michael Jackson', 0.99995047))
(16, ('LeBron James', 0.99995047))
(17, ('Sex', 0.99995035))
(18, ('Angelina Jolie', 0.9999503))
(19, ('Star Wars', 0.9999503))
(20, ('Periodic Table', 0.99995023))

10 closest search terms to the query:
('negan', 0.99995667)
('megan', 0.9999555)
('hannigan', 0.9999527)
('cox', 0.9999525)
('michigan', 0.99995166)
('lifetime', 0.9999511)
('conspiracy', 0.99995095)
('interpol', 0.99995095)
('deter', 0.99995095)
('respect', 0.9999508)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 19
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 13
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 2
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 12
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 8
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 18
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 15
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 17
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 7
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 14
```

```
Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 16

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Taj Mahal
TF-IDF:
Time taken to make the search:
CPU times: user 20.5 ms, sys: 2.02 ms, total: 22.6 ms
Wall time: 22.6 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
```

```
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.1 s, sys: 5.66 ms, total: 1.1 s
Wall time: 1.11 s
Articles closest to given word ranked:
(1, ('Breaking Bad', 0.99999756))
(2, ('Donald Trump', 0.99999756))
(3, ('September 11 attacks', 0.9999965))
(4, ('Abraham Lincoln', 0.9999964))
(5, ('Angelina Jolie', 0.9999964))
(6, ('Winston Churchill', 0.9999964))
(7, ('Vietnam War', 0.9999964))
(8, ('How I Met Your Mother', 0.99999636))
(9, ('Lil Wayne', 0.99999636))
(10, ('LeBron James', 0.99999636))
(11, ('Madonna', 0.99999636))
(12, ('The Walking Dead (TV series)', 0.99999636))
(13, ('World War II', 0.99999636))
(14, ('Star Wars', 0.99999636))
(15, ('United Kingdom', 0.9999963))
(16, ('Sex', 0.9999963))
(17, ('Michael Jackson', 0.9999962))
(18, ('Kobe Bryant', 0.9999962))
(19, ('Lionel Messi', 0.9999962))
(20, ('Periodic Table', 0.9999961))

10 closest search terms to the query:
('hal', 0.99999756)
('mahal', 0.99999756)
('conditional', 0.99999654)
('al', 0.9999965)
('paternal', 0.9999964)
('conventional', 0.9999964)
('coal', 0.9999964)
('critical', 0.99999636)
('mental', 0.99999636)
('recreational', 0.99999636)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 14
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 13
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 8
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 9
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 15
Article: Angelina Jolie
Rank in tf-idf: 6
```

Rank in Word2Vec: 5
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 17
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 16
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 6
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 1

Selected Algo: tf-idf
Article selected: LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 10

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Burj Khalifa
TF-IDF:
Time taken to make the search:
CPU times: user 19.7 ms, sys: 2.04 ms, total: 21.8 ms
Wall time: 21.8 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')

```
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.07 s, sys: 7.74 ms, total: 1.07 s
Wall time: 1.07 s
Articles closest to given word ranked:
(1, ('Lil Wayne', 0.9999863))
(2, ('Winston Churchill', 0.9999744))
(3, ('September 11 attacks', 0.9999664))
(4, ('Abraham Lincoln', 0.9999661))
(5, ('The Walking Dead (TV series)', 0.9999661))
(6, ('Donald Trump', 0.9999661))
(7, ('Lionel Messi', 0.99996585))
(8, ('Star Wars', 0.99996585))
(9, ('LeBron James', 0.9999657))
(10, ('United Kingdom', 0.99996567))
(11, ('Vietnam War', 0.99996567))
(12, ('Michael Jackson', 0.99996555))
(13, ('How I Met Your Mother', 0.9999655))
(14, ('Angelina Jolie', 0.9999655))
(15, ('Breaking Bad', 0.9999655))
(16, ('Madonna', 0.9999655))
(17, ('Periodic Table', 0.9999655))
(18, ('Sex', 0.9999654))
(19, ('Kobe Bryant', 0.9999654))
(20, ('World War II', 0.9999653))

10 closest search terms to the query:
('khalifa', 0.9999863)
('halifax', 0.9999744)
('arlington', 0.9999664)
('lincoln', 0.9999661)
('alienate', 0.99996597)
('alien', 0.99996585)
('violate', 0.9999657)
('coalition', 0.99996567)
('qualification', 0.99996567)
('costarred', 0.99996555)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 8
```

```
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 20
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 13
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 1
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 10
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 14
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 12
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 18
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 2
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 15

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 9

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Great Wall of China
TF-IDF:
Time taken to make the search:
CPU times: user 21.7 ms, sys: 2.04 ms, total: 23.8 ms
Wall time: 23.5 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
```

```
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.1 s, sys: 11.9 ms, total: 1.11 s
Wall time: 1.09 s
Articles closest to given word ranked:
(1, ('Lil Wayne', 0.9999976))
(2, ('Angelina Jolie', 0.9999976))
(3, ('Winston Churchill', 0.9999976))
(4, ('Breaking Bad', 0.9999976))
(5, ('United Kingdom', 0.99999756))
(6, ('Michael Jackson', 0.99999756))
(7, ('The Walking Dead (TV series)', 0.99999756))
(8, ('Kobe Bryant', 0.9999975))
(9, ('Abraham Lincoln', 0.99999744))
(10, ('How I Met Your Mother', 0.99999744))
(11, ('Sex', 0.99999744))
(12, ('LeBron James', 0.99999744))
(13, ('Madonna', 0.99999744))
(14, ('September 11 attacks', 0.99999744))
(15, ('Donald Trump', 0.99999744))
(16, ('Periodic Table', 0.99999744))
(17, ('Lionel Messi', 0.99999744))
(18, ('Vietnam War', 0.99999744))
(19, ('World War II', 0.99999744))
(20, ('Star Wars', 0.99999744))

10 closest search terms to the query:
('professionally', 0.9999976)
```

```
('recreational', 0.9999976)
('internationally', 0.99999756)
('emotionally', 0.99999756)
('threatening', 0.99999756)
('economically', 0.99999756)
('intentionally', 0.9999975)
('stance', 0.99999744)
('create', 0.99999744)
('recent', 0.99999744)


Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 20
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 19
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 10
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 1
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 5
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 2
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 6
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 11
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 3
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 4


Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 12

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
```

```
8 foul
9 lando
10 alive


query:  Berlin Wall
TF-IDF:
Time taken to make the search:
CPU times: user 23.1 ms, sys: 2.05 ms, total: 25.1 ms
Wall time: 24.2 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.09 s, sys: 17.5 ms, total: 1.11 s
Wall time: 1.09 s
Articles closest to given word ranked:
(1, ('Winston Churchill', 0.9999977))
(2, ('The Walking Dead (TV series)', 0.9999975))
(3, ('Vietnam War', 0.99999744))
(4, ('World War II', 0.99999744))
(5, ('Angelina Jolie', 0.9999972))
(6, ('Lil Wayne', 0.9999971))
(7, ('LeBron James', 0.9999971))
(8, ('Kobe Bryant', 0.9999971))
(9, ('September 11 attacks', 0.9999971))
```

```
(10, ('Donald Trump', 0.9999971))
(11, ('Lionel Messi', 0.9999971))
(12, ('Michael Jackson', 0.999997))
(13, ('Abraham Lincoln', 0.99999696))
(14, ('United Kingdom', 0.99999696))
(15, ('Sex', 0.99999696))
(16, ('Breaking Bad', 0.99999696))
(17, ('Madonna', 0.99999696))
(18, ('Periodic Table', 0.99999696))
(19, ('Star Wars', 0.99999696))
(20, ('How I Met Your Mother', 0.99999654))

10 closest search terms to the query:
('sterling', 0.9999977)
('sperling', 0.9999975)
('stall', 0.99999744)
('commander', 0.9999972)
('sentence', 0.9999971)
('ball', 0.9999971)
('changeling', 0.999997)
('wall', 0.999997)
('confinement', 0.999997)
('contingent', 0.999997)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 19
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 4
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 20
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 6
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 14
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 5
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 12
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 15
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 1
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 16

Selected Algo: tf-idf
Article selected:  LeBron James
```

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 7

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Machu Picchu
TF-IDF:
Time taken to make the search:
CPU times: user 22.4 ms, sys: 4.06 ms, total: 26.5 ms
Wall time: 24.9 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

```
Word2Vec:
Time taken to make the search:
CPU times: user 1.07 s, sys: 3.75 ms, total: 1.08 s
Wall time: 1.08 s
Articles closest to given word ranked:
(1, ('Abraham Lincoln', 0.9999495))
(2, ('LeBron James', 0.99994916))
(3, ('Kobe Bryant', 0.99994916))
(4, ('Vietnam War', 0.99994916))
(5, ('Donald Trump', 0.99994874))
(6, ('World War II', 0.99994874))
(7, ('Winston Churchill', 0.9999486))
(8, ('Madonna', 0.9999485))
(9, ('How I Met Your Mother', 0.99994844))
(10, ('United Kingdom', 0.99994844))
(11, ('Angelina Jolie', 0.99994844))
(12, ('Michael Jackson', 0.99994844))
(13, ('Breaking Bad', 0.99994844))
(14, ('The Walking Dead (TV series)', 0.99994844))
(15, ('September 11 attacks', 0.99994844))
(16, ('Lionel Messi', 0.99994844))
(17, ('Lil Wayne', 0.99994814))
(18, ('Periodic Table', 0.99994814))
(19, ('Sex', 0.99994725))
(20, ('Star Wars', 0.99994725))

10 closest search terms to the query:
('massachusetts', 0.9999495)
('trail', 0.99994916)
('boston', 0.99994874)
('manchukuo', 0.99994874)
('democratic', 0.9999486)
('unavailable', 0.99994856)
('manchuria', 0.99994856)
('cheerleading', 0.9999485)
('establish', 0.99994844)
('establishment', 0.9999484)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 20
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 6
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 9
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 17
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 10
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 11
Article: Michael Jackson
Rank in tf-idf: 7
```

Rank in Word2Vec: 12
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 19
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 7
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 13

Selected Algo: tf-idf
Article selected: LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 2

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Stonehenge
TF-IDF:
Time taken to make the search:
CPU times: user 21 ms, sys: 2.02 ms, total: 23 ms
Wall time: 22.9 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')

```
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.11 s, sys: 14 ms, total: 1.12 s
Wall time: 1.12 s
Articles closest to given word ranked:
(1, ('Breaking Bad', 0.9999938))
(2, ('Star Wars', 0.9999938))
(3, ('United Kingdom', 0.9999937))
(4, ('Michael Jackson', 0.9999936))
(5, ('Abraham Lincoln', 0.99999356))
(6, ('Lil Wayne', 0.99999356))
(7, ('Angelina Jolie', 0.99999356))
(8, ('Winston Churchill', 0.99999356))
(9, ('LeBron James', 0.99999356))
(10, ('Madonna', 0.99999356))
(11, ('The Walking Dead (TV series)', 0.99999356))
(12, ('Kobe Bryant', 0.99999356))
(13, ('September 11 attacks', 0.99999356))
(14, ('Donald Trump', 0.99999356))
(15, ('Periodic Table', 0.99999356))
(16, ('Lionel Messi', 0.99999356))
(17, ('Vietnam War', 0.99999356))
(18, ('World War II', 0.99999356))
(19, ('How I Met Your Mother', 0.9999935))
(20, ('Sex', 0.9999935))

10 closest search terms to the query:
('criminally', 0.9999938)
('revenge', 0.9999938)
('historically', 0.9999937)
('manslaughter', 0.9999936)
('come', 0.99999356)
('criminal', 0.99999356)
('master', 0.99999356)
('regard', 0.99999356)
('traditionally', 0.99999356)
('personally', 0.99999356)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 2
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 18
```

Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 19
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 6
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 3
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 7
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 4
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 20
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 8
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 1

Selected Algo: tf-idf
Article selected: LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 9

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Colosseum
TF-IDF:
Time taken to make the search:
CPU times: user 19.1 ms, sys: 3 ms, total: 22.1 ms
Wall time: 22.1 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')

```
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.08 s, sys: 12.9 ms, total: 1.1 s
Wall time: 1.09 s
Articles closest to given word ranked:
(1, ('Abraham Lincoln', 0.9999857))
(2, ('How I Met Your Mother', 0.9999857))
(3, ('Lil Wayne', 0.9999857))
(4, ('United Kingdom', 0.9999857))
(5, ('Michael Jackson', 0.9999857))
(6, ('Sex', 0.9999857))
(7, ('Winston Churchill', 0.9999857))
(8, ('LeBron James', 0.9999857))
(9, ('Madonna', 0.9999857))
(10, ('The Walking Dead (TV series)', 0.9999857))
(11, ('Kobe Bryant', 0.9999857))
(12, ('September 11 attacks', 0.9999857))
(13, ('Donald Trump', 0.9999857))
(14, ('Periodic Table', 0.9999857))
(15, ('Lionel Messi', 0.9999857))
(16, ('Vietnam War', 0.9999857))
(17, ('World War II', 0.9999857))
(18, ('Star Wars', 0.9999857))
(19, ('Breaking Bad', 0.99998546))
(20, ('Angelina Jolie', 0.99998516))

10 closest search terms to the query:
('may', 0.9999857)
('remainder', 0.99998546)
('walmart', 0.99998546)
('helicopter', 0.9999854)
```

```
('remain', 0.99998516)
('maine', 0.99998516)
('compelling', 0.99998516)
('masher', 0.99998516)
('interviewer', 0.9999851)
('fraser', 0.9999851)


Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 18
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 17
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 2
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 3
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 4
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 20
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 5
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 6
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 7
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 19


Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 8

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive
```

```
query:  White House
TF-IDF:
Time taken to make the search:
CPU times: user 20.5 ms, sys: 4.03 ms, total: 24.6 ms
Wall time: 24.4 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.08 s, sys: 15.3 ms, total: 1.1 s
Wall time: 1.08 s
Articles closest to given word ranked:
(1, ('Abraham Lincoln', 0.9999983))
(2, ('Lil Wayne', 0.9999983))
(3, ('United Kingdom', 0.9999983))
(4, ('Michael Jackson', 0.9999983))
(5, ('Winston Churchill', 0.9999983))
(6, ('Madonna', 0.9999983))
(7, ('September 11 attacks', 0.9999983))
(8, ('Donald Trump', 0.9999983))
(9, ('How I Met Your Mother', 0.999998))
(10, ('Angelina Jolie', 0.999998))
(11, ('Sex', 0.999998))
(12, ('Breaking Bad', 0.999998))
```

```
(13, ('LeBron James', 0.999998))
(14, ('The Walking Dead (TV series)', 0.999998))
(15, ('Periodic Table', 0.999998))
(16, ('Lionel Messi', 0.999998))
(17, ('Vietnam War', 0.999998))
(18, ('World War II', 0.999998))
(19, ('Star Wars', 0.999998))
(20, ('Kobe Bryant', 0.9999978))


10 closest search terms to the query:
('house', 0.9999983)
('penthouse', 0.9999981)
('use', 0.999998)
('material', 0.999998)
('management', 0.99999785)
('implement', 0.9999978)
('settlement', 0.9999978)
('counter', 0.9999978)
('confinement', 0.9999978)
('incitement', 0.9999978)


Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 19
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 18
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 9
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 2
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 3
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 10
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 4
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 11
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 5
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 12


Selected Algo: tf-idf
Article selected:  LeBron James


link of the article:
https://en.wikipedia.org/wiki/LeBron_James
```

```
tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 13

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Petra
TF-IDF:
Time taken to make the search:
CPU times: user 21 ms, sys: 1.9 ms, total: 22.9 ms
Wall time: 22.8 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.08 s, sys: 18.1 ms, total: 1.09 s
```

```
Wall time: 1.08 s
Articles closest to given word ranked:
(1, ('The Walking Dead (TV series)', 0.9999881))
(2, ('Sex', 0.9999868))
(3, ('Winston Churchill', 0.9999868))
(4, ('Madonna', 0.9999868))
(5, ('Kobe Bryant', 0.9999868))
(6, ('Donald Trump', 0.9999868))
(7, ('Abraham Lincoln', 0.9999867))
(8, ('How I Met Your Mother', 0.9999867))
(9, ('Michael Jackson', 0.9999867))
(10, ('LeBron James', 0.9999867))
(11, ('Lionel Messi', 0.9999867))
(12, ('United Kingdom', 0.9999866))
(13, ('Vietnam War', 0.9999866))
(14, ('Angelina Jolie', 0.99998635))
(15, ('September 11 attacks', 0.99998635))
(16, ('Lil Wayne', 0.9999863))
(17, ('Breaking Bad', 0.9999863))
(18, ('Star Wars', 0.9999862))
(19, ('Periodic Table', 0.99998605))
(20, ('World War II', 0.99998605))

10 closest search terms to the query:
('intra', 0.9999881)
('attract', 0.9999868)
('contract', 0.9999867)
('contractor', 0.99998665)
('constant', 0.9999866)
('contrary', 0.9999866)
('confederate', 0.9999865)
('tract', 0.9999865)
('constantinople', 0.99998647)
('trader', 0.9999864)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 18
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 20
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 8
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 16
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 12
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 14
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 9
Article: Sex
Rank in tf-idf: 8
```

```
Rank in Word2Vec: 2
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 3
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 17


Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 10

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Dubai
TF-IDF:
Time taken to make the search:
CPU times: user 19 ms, sys: 3.98 ms, total: 23 ms
Wall time: 22.8 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
```

```
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.09 s, sys: 2.65 ms, total: 1.09 s
Wall time: 1.1 s
Articles closest to given word ranked:
(1, ('September 11 attacks', 0.99752563))
(2, ('Donald Trump', 0.99752563))
(3, ('Breaking Bad', 0.9964145))
(4, ('Vietnam War', 0.9964145))
(5, ('Lionel Messi', 0.99638826))
(6, ('Angelina Jolie', 0.9963737))
(7, ('Madonna', 0.9963595))
(8, ('Kobe Bryant', 0.9963595))
(9, ('World War II', 0.9963595))
(10, ('Periodic Table', 0.99635917))
(11, ('United Kingdom', 0.9963518))
(12, ('Abraham Lincoln', 0.99635154))
(13, ('How I Met Your Mother', 0.99634653))
(14, ('The Walking Dead (TV series)', 0.99633276))
(15, ('Lil Wayne', 0.99632984))
(16, ('Michael Jackson', 0.99632984))
(17, ('Star Wars', 0.99632585))
(18, ('Sex', 0.99632084))
(19, ('LeBron James', 0.99632084))
(20, ('Winston Churchill', 0.9963205))

10 closest search terms to the query:
('dubai', 0.99752563)
('arc', 0.9964145)
('luis', 0.99638826)
('queens', 0.99637866)
('loaf', 0.9963737)
('dowd', 0.9963659)
('opioid', 0.9963641)
('việt', 0.99636376)
('nagai', 0.99636257)
('suburb', 0.9963595)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 17
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 9
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 13
```

Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 15
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 11
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 6
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 16
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 18
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 20
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 3

Selected Algo: tf-idf
Article selected: LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 19

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Paris
TF-IDF:
Time taken to make the search:
CPU times: user 18.6 ms, sys: 3.98 ms, total: 22.6 ms
Wall time: 22.5 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')

```
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.13 s, sys: 12 ms, total: 1.14 s
Wall time: 1.12 s
Articles closest to given word ranked:
(1, ('United Kingdom', 0.9999906))
(2, ('Winston Churchill', 0.9999906))
(3, ('Madonna', 0.9999906))
(4, ('Donald Trump', 0.9999906))
(5, ('Lionel Messi', 0.9999906))
(6, ('Vietnam War', 0.9999906))
(7, ('World War II', 0.9999906))
(8, ('Abraham Lincoln', 0.99998707))
(9, ('Michael Jackson', 0.9999868))
(10, ('Sex', 0.9999868))
(11, ('Breaking Bad', 0.9999868))
(12, ('LeBron James', 0.9999868))
(13, ('The Walking Dead (TV series)', 0.9999868))
(14, ('Kobe Bryant', 0.9999868))
(15, ('September 11 attacks', 0.9999868))
(16, ('Periodic Table', 0.9999868))
(17, ('Star Wars', 0.9999868))
(18, ('Lil Wayne', 0.99998677))
(19, ('Angelina Jolie', 0.9999867))
(20, ('How I Met Your Mother', 0.99998623))

10 closest search terms to the query:
('paris', 0.9999906)
('derisively', 0.99998707)
('reverse', 0.9999868)
('different', 0.9999868)
('directly', 0.9999868)
('verse', 0.99998677)
('advertisement', 0.99998677)
```

```
('definitely', 0.9999867)
('imprisonment', 0.99998665)
('characterisation', 0.99998665)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 17
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 7
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 20
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 18
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 1
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 19
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 9
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 10
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 2
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 11

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 12

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Mumbai
```

```
TF-IDF:
Time taken to make the search:
CPU times: user 21.2 ms, sys: 2.02 ms, total: 23.2 ms
Wall time: 23.2 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.06 s, sys: 2.88 ms, total: 1.06 s
Wall time: 1.06 s
Articles closest to given word ranked:
(1, ('Winston Churchill', 0.9998174))
(2, ('LeBron James', 0.9998143))
(3, ('Kobe Bryant', 0.9998143))
(4, ('Angelina Jolie', 0.99981296))
(5, ('The Walking Dead (TV series)', 0.9998128))
(6, ('Star Wars', 0.9998126))
(7, ('Breaking Bad', 0.99981254))
(8, ('How I Met Your Mother', 0.99981225))
(9, ('Lil Wayne', 0.99981225))
(10, ('Michael Jackson', 0.99981225))
(11, ('Madonna', 0.99981225))
(12, ('Vietnam War', 0.99981225))
(13, ('United Kingdom', 0.9998121))
(14, ('Donald Trump', 0.999812))
(15, ('Sex', 0.99981177))
```

```
(16, ('September 11 attacks', 0.99981177))
(17, ('World War II', 0.99981177))
(18, ('Lionel Messi', 0.9998114))
(19, ('Abraham Lincoln', 0.9998113))
(20, ('Periodic Table', 0.99981093))

10 closest search terms to the query:
('bambatha', 0.9998174)
('disgust', 0.9998153)
('employer', 0.99981505)
('eject', 0.9998143)
('sourly', 0.99981296)
('shawshank', 0.9998128)
('hyperspace', 0.9998126)
('batch', 0.99981254)
('song', 0.99981225)
('businesswoman', 0.99981225)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 6
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 17
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 8
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 9
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 13
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 4
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 10
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 15
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 1
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 7

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 2
```

```
10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Chicago
TF-IDF:
Time taken to make the search:
CPU times: user 20.1 ms, sys: 1.79 ms, total: 21.9 ms
Wall time: 21.9 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.13 s, sys: 33.1 ms, total: 1.16 s
Wall time: 1.13 s
Articles closest to given word ranked:
(1, ('Abraham Lincoln', 0.99998665))
```

```
(2, ('How I Met Your Mother', 0.99998665))
(3, ('Angelina Jolie', 0.99998665))
(4, ('Michael Jackson', 0.99998665))
(5, ('Breaking Bad', 0.99998665))
(6, ('Kobe Bryant', 0.99998665))
(7, ('Lil Wayne', 0.99997276))
(8, ('Madonna', 0.99997276))
(9, ('Lionel Messi', 0.99997276))
(10, ('LeBron James', 0.9999718))
(11, ('Star Wars', 0.9999718))
(12, ('The Walking Dead (TV series)', 0.9999717))
(13, ('Vietnam War', 0.9999717))
(14, ('World War II', 0.9999717))
(15, ('United Kingdom', 0.9999716))
(16, ('Donald Trump', 0.9999716))
(17, ('Winston Churchill', 0.9999714))
(18, ('September 11 attacks', 0.9999714))
(19, ('Periodic Table', 0.99997133))
(20, ('Sex', 0.9999711))

10 closest search terms to the query:
('chicago', 0.99998665)
('influential', 0.99997276)
('cooking', 0.99997246)
('technical', 0.9999718)
('prospect', 0.9999717)
('prosperous', 0.9999717)
('peking', 0.9999717)
('covid', 0.9999716)
('prosperity', 0.9999716)
('celebrate', 0.99997157)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 11
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 14
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 2
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 7
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 15
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 3
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 4
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 20
Article: Winston Churchill
Rank in tf-idf: 9
```

Rank in Word2Vec: 17
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 5

Selected Algo: tf-idf
Article selected: LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 10

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive

query: Rome
TF-IDF:
Time taken to make the search:
CPU times: user 28.8 ms, sys: 2.01 ms, total: 30.8 ms
Wall time: 30.6 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation

```
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.06 s, sys: 19.9 ms, total: 1.08 s
Wall time: 1.07 s
Articles closest to given word ranked:
(1, ('Abraham Lincoln', 0.99999785))
(2, ('Lil Wayne', 0.99999785))
(3, ('United Kingdom', 0.99999785))
(4, ('Angelina Jolie', 0.99999785))
(5, ('Michael Jackson', 0.99999785))
(6, ('Winston Churchill', 0.99999785))
(7, ('Breaking Bad', 0.99999785))
(8, ('LeBron James', 0.99999785))
(9, ('Madonna', 0.99999785))
(10, ('The Walking Dead (TV series)', 0.99999785))
(11, ('Kobe Bryant', 0.99999785))
(12, ('September 11 attacks', 0.99999785))
(13, ('Donald Trump', 0.99999785))
(14, ('Periodic Table', 0.99999785))
(15, ('Lionel Messi', 0.99999785))
(16, ('Vietnam War', 0.99999785))
(17, ('World War II', 0.99999785))
(18, ('How I Met Your Mother', 0.9999978))
(19, ('Star Wars', 0.9999978))
(20, ('Sex', 0.9999964))

10 closest search terms to the query:
('come', 0.99999785)
('become', 0.9999978)
('income', 0.99999744)
('rome', 0.999997)
('home', 0.99999696)
('history', 0.99999666)
('overcome', 0.99999666)
('recover', 0.99999666)
('becomes', 0.99999666)
('regime', 0.9999966)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 19
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 17
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 18
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 2
```

```
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 3
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 4
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 5
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 20
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 6
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 7


Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 8

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Tokyo
TF-IDF:
Time taken to make the search:
CPU times: user 22.5 ms, sys: 3.03 ms, total: 25.6 ms
Wall time: 24.4 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
```

```
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.2 s, sys: 38.7 ms, total: 1.24 s
Wall time: 1.2 s
Articles closest to given word ranked:
(1, ('Michael Jackson', 0.99964356))
(2, ('Periodic Table', 0.99951005))
(3, ('LeBron James', 0.99950415))
(4, ('World War II', 0.9995039))
(5, ('Abraham Lincoln', 0.9995021))
(6, ('The Walking Dead (TV series)', 0.9995021))
(7, ('Breaking Bad', 0.9995008))
(8, ('Lil Wayne', 0.99950033))
(9, ('Angelina Jolie', 0.99950033))
(10, ('Lionel Messi', 0.99950033))
(11, ('Madonna', 0.9994993))
(12, ('September 11 attacks', 0.9994983))
(13, ('Winston Churchill', 0.9994978))
(14, ('How I Met Your Mother', 0.9994974))
(15, ('United Kingdom', 0.9994972))
(16, ('Sex', 0.999497))
(17, ('Donald Trump', 0.999497))
(18, ('Kobe Bryant', 0.99949646))
(19, ('Vietnam War', 0.9994963))
(20, ('Star Wars', 0.999496))

10 closest search terms to the query:
('tokyo', 0.99964356)
('erythematosus', 0.999524)
('sulfur', 0.99951005)
('disliked', 0.99950415)
('motivated', 0.9995039)
('extended', 0.9995021)
('overqualified', 0.9995008)
('kid', 0.99950033)
('tunisia', 0.9994993)
('taped', 0.9994983)
```

```
Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 20
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 4
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 14
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 8
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 15
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 9
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 1
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 16
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 13
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 7

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 3

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
3 category
4 early
5 clinch
6 break
7 strange
8 foul
9 lando
10 alive


query:  Toronto
TF-IDF:
Time taken to make the search:
CPU times: user 23.3 ms, sys: 2.03 ms, total: 25.4 ms
```

```
Wall time: 25.8 ms

Articles closest to given word ranked:
(1, 'Star Wars')
(2, 'World War II')
(3, 'How I Met Your Mother')
(4, 'Lil Wayne')
(5, 'United Kingdom')
(6, 'Angelina Jolie')
(7, 'Michael Jackson')
(8, 'Sex')
(9, 'Winston Churchill')
(10, 'Breaking Bad')
(11, 'LeBron James')
(12, 'Madonna')
(13, 'The Walking Dead (TV series)')
(14, 'Kobe Bryant')
(15, 'September 11 attacks')
(16, 'Donald Trump')
(17, 'Periodic Table')
(18, 'Lionel Messi')
(19, 'Vietnam War')
(20, 'Abraham Lincoln')

10 closest search terms to the query:
1 saga
2 retell
3 explanation
4 junior
5 paula
6 peace
7 dumb
8 dangle
9 bed
10 hush

Word2Vec:
Time taken to make the search:
CPU times: user 1.12 s, sys: 10.8 ms, total: 1.13 s
Wall time: 1.13 s
Articles closest to given word ranked:
(1, ('LeBron James', 0.99998057))
(2, ('Kobe Bryant', 0.99998057))
(3, ('Michael Jackson', 0.9999614))
(4, ('Lionel Messi', 0.9999597))
(5, ('The Walking Dead (TV series)', 0.99995947))
(6, ('September 11 attacks', 0.99995947))
(7, ('Vietnam War', 0.99995947))
(8, ('Abraham Lincoln', 0.99995935))
(9, ('How I Met Your Mother', 0.99995935))
(10, ('Lil Wayne', 0.99995935))
(11, ('United Kingdom', 0.99995935))
(12, ('Angelina Jolie', 0.99995935))
(13, ('Winston Churchill', 0.99995935))
(14, ('Donald Trump', 0.99995935))
(15, ('Breaking Bad', 0.99995923))
(16, ('World War II', 0.99995923))
(17, ('Star Wars', 0.99995923))
(18, ('Sex', 0.9999589))
```

```
(19, ('Periodic Table', 0.9999589))
(20, ('Madonna', 0.9999588))

10 closest search terms to the query:
('toronto', 0.99998057)
('repertoire', 0.9999614)
('sacramento', 0.9999598)
('inaugural', 0.9999597)
('confront', 0.99995947)
('pentagon', 0.99995947)
('practice', 0.99995935)
('seductive', 0.99995935)
('rice', 0.99995935)
('constant', 0.9999593)

Rank in Word2Vec of first 10 closest articles in tf-idf to query:
Article: Star Wars
Rank in tf-idf: 1
Rank in Word2Vec: 17
Article: World War II
Rank in tf-idf: 2
Rank in Word2Vec: 16
Article: How I Met Your Mother
Rank in tf-idf: 3
Rank in Word2Vec: 9
Article: Lil Wayne
Rank in tf-idf: 4
Rank in Word2Vec: 10
Article: United Kingdom
Rank in tf-idf: 5
Rank in Word2Vec: 11
Article: Angelina Jolie
Rank in tf-idf: 6
Rank in Word2Vec: 12
Article: Michael Jackson
Rank in tf-idf: 7
Rank in Word2Vec: 3
Article: Sex
Rank in tf-idf: 8
Rank in Word2Vec: 18
Article: Winston Churchill
Rank in tf-idf: 9
Rank in Word2Vec: 13
Article: Breaking Bad
Rank in tf-idf: 10
Rank in Word2Vec: 15

Selected Algo: tf-idf
Article selected:  LeBron James

link of the article:
https://en.wikipedia.org/wiki/LeBron_James

tf-idf rank of article with respect to query: 11
Word2Vec rank of article with respect to query: 1

10 Closest Search terms using tf-idf of the selected article:
1 junior
2 mo
```

```
 3 category
 4 early
 5 clinch
 6 break
 7 strange
 8 foul
 9 lando
10 alive
```

PART 2: IMAGE SEARCH ENGINE

FOR SIFT
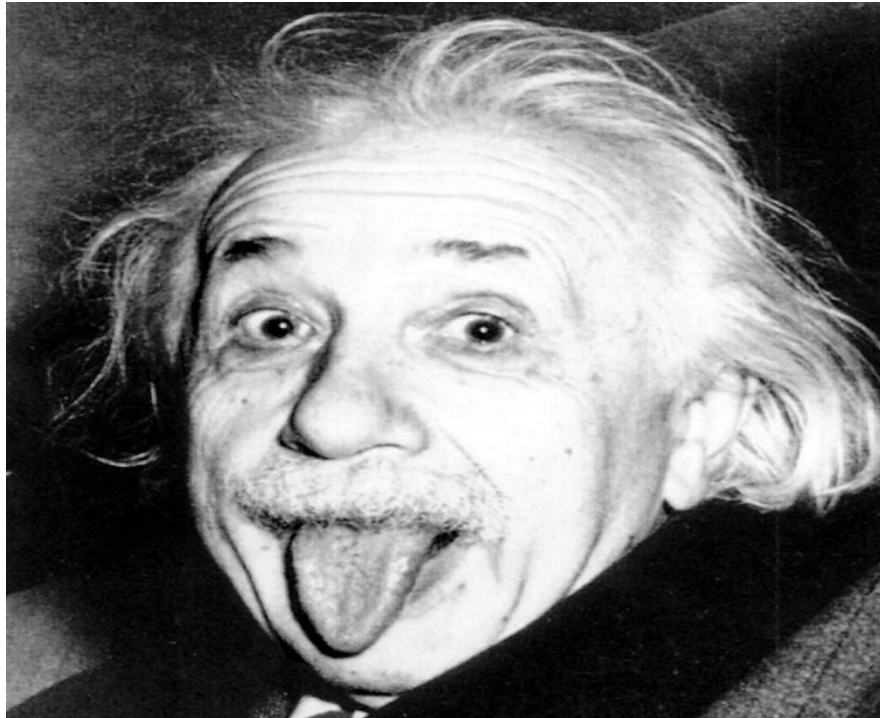
Figure 1: Query Image

Results of SIFT
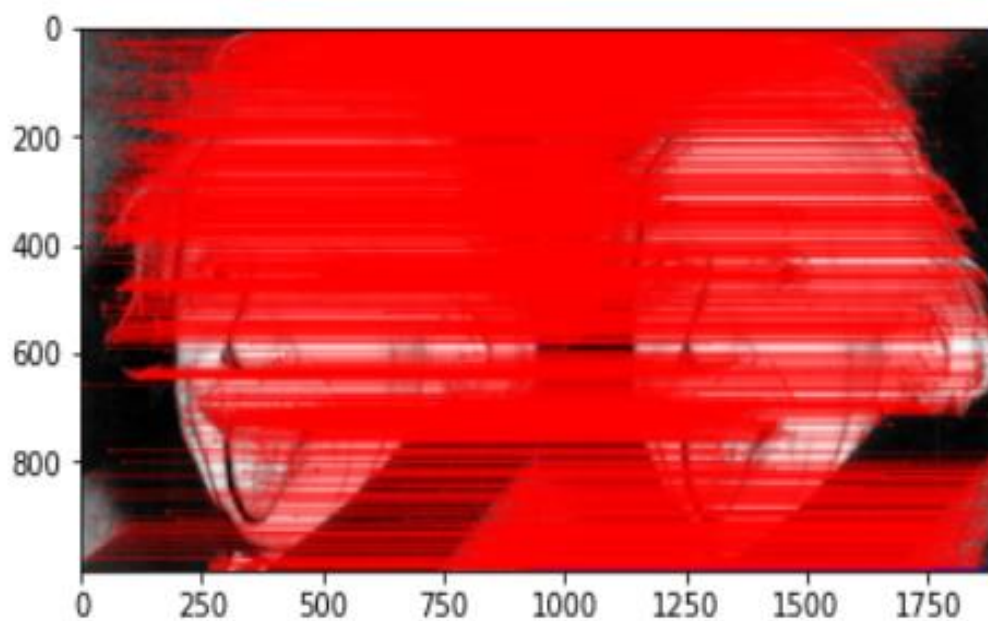
Figure 2: Rank1 match image
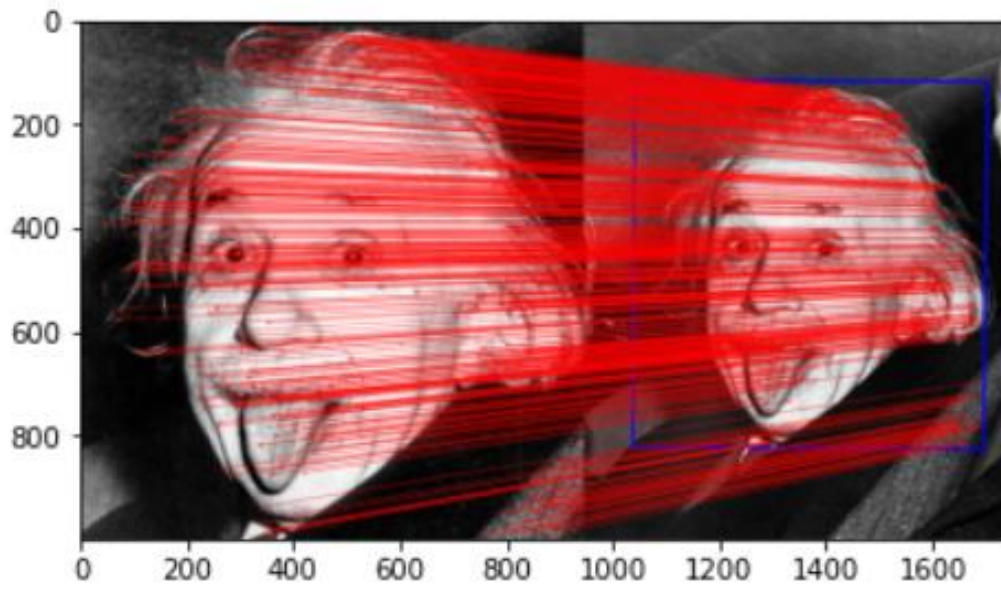
Figure 3: Rank2 match image
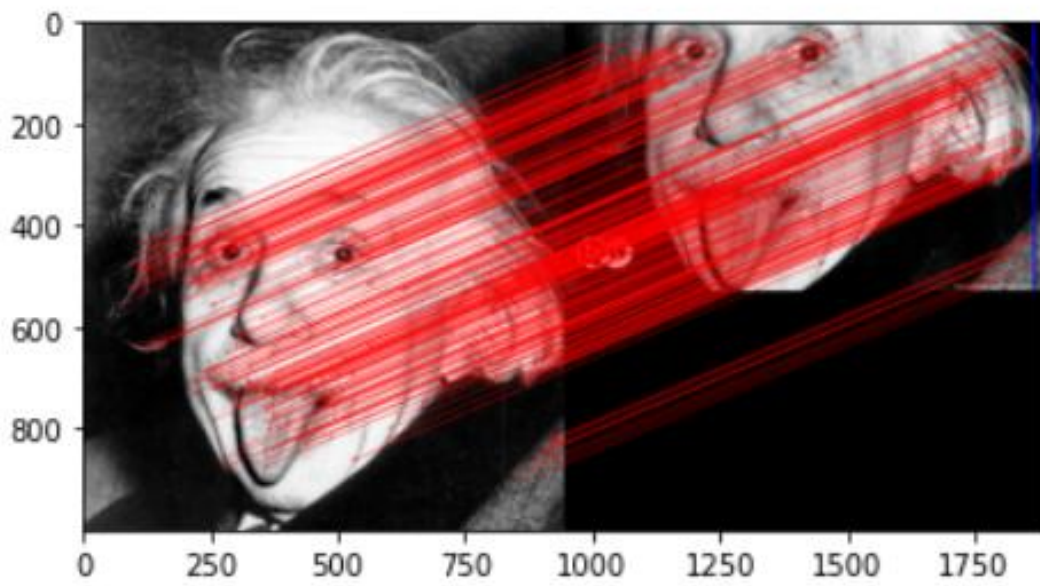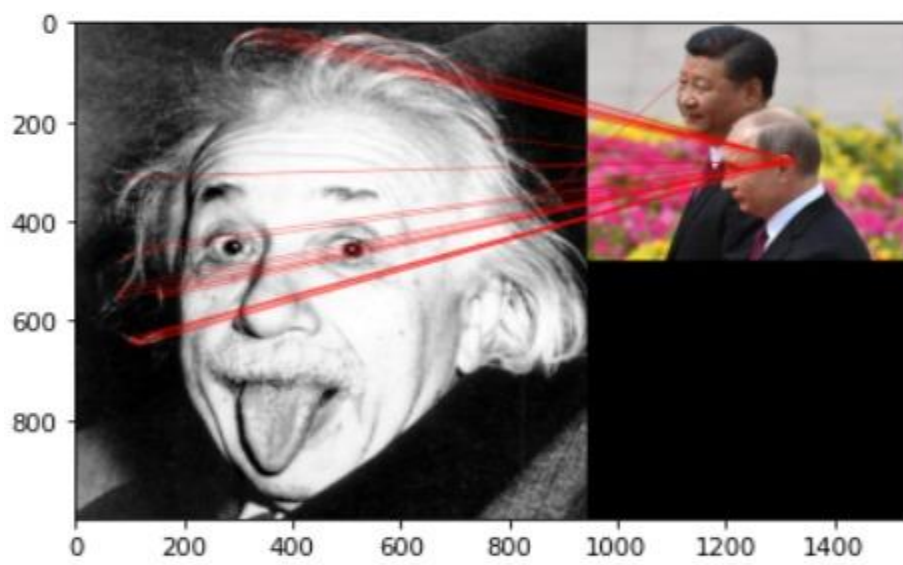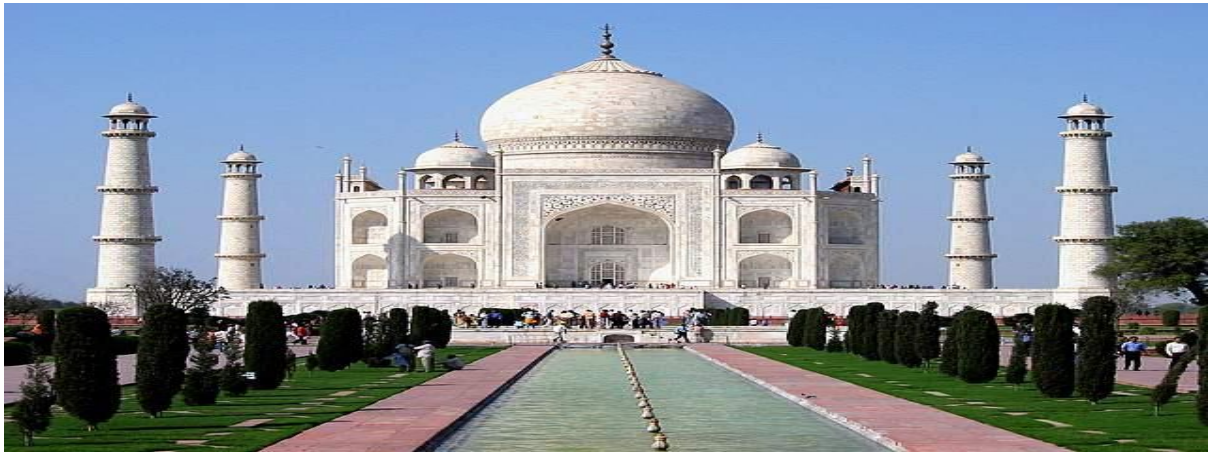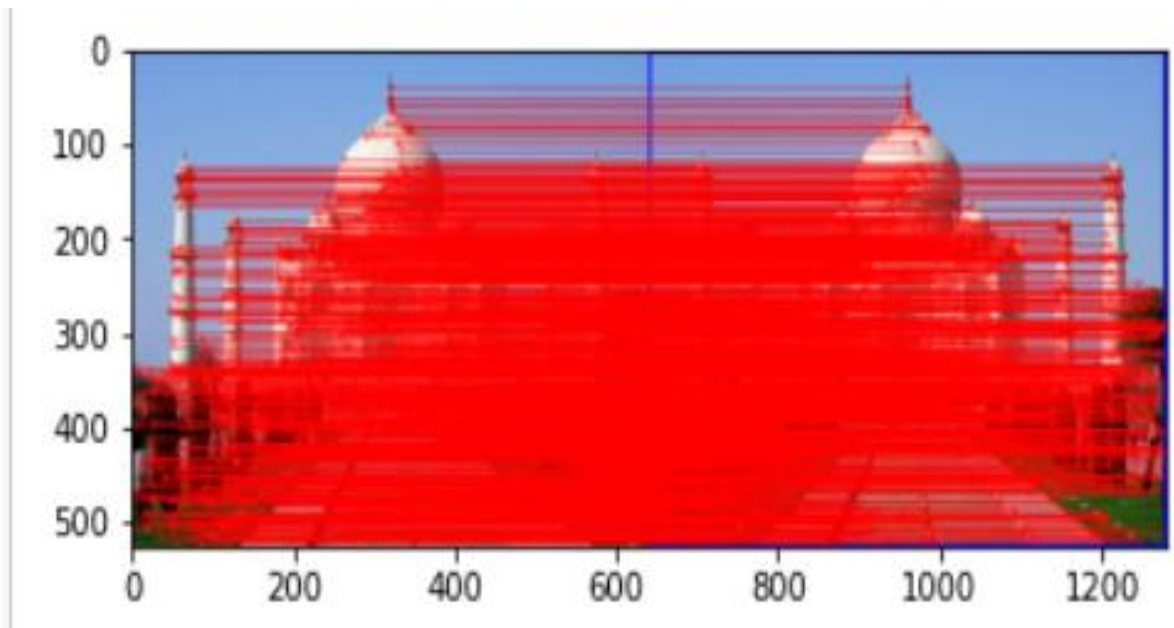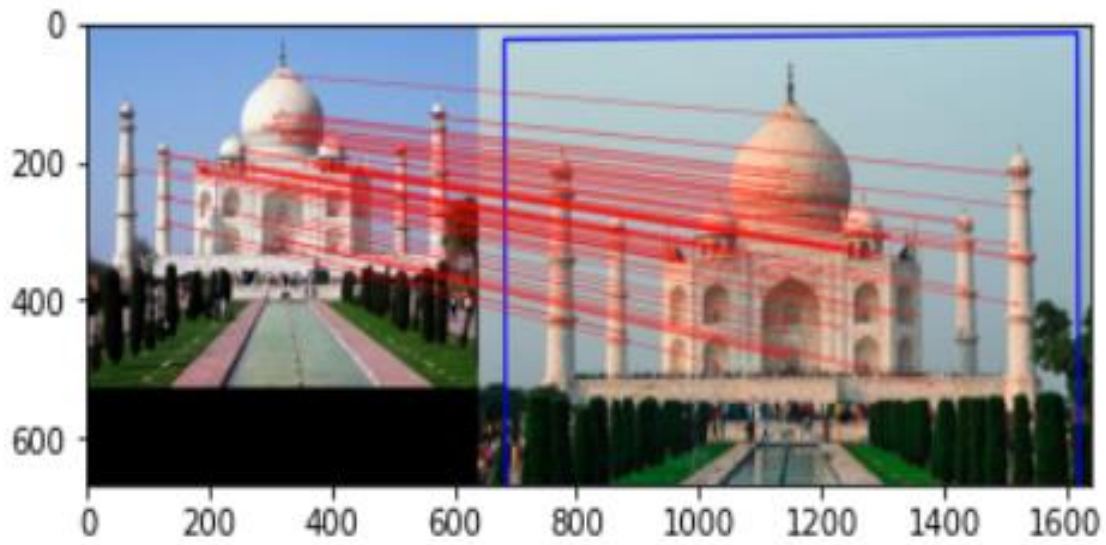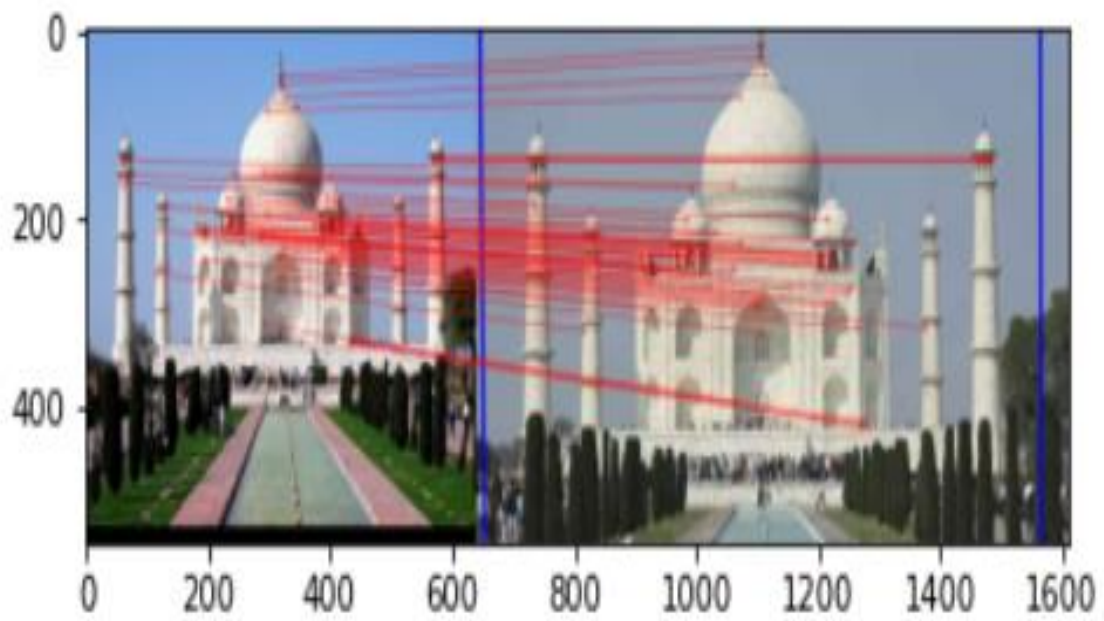

Figure 4: Rank3 match image

TIME TAKEN FOR MATCHING: 99.203 seconds

FOR BAG OF VISUAL WORDS

Figure 4: Query Image

Results of BAG OF VISUAL WORDS

Figure 5: Rank1 match image

Figure 6: Rank2 match image
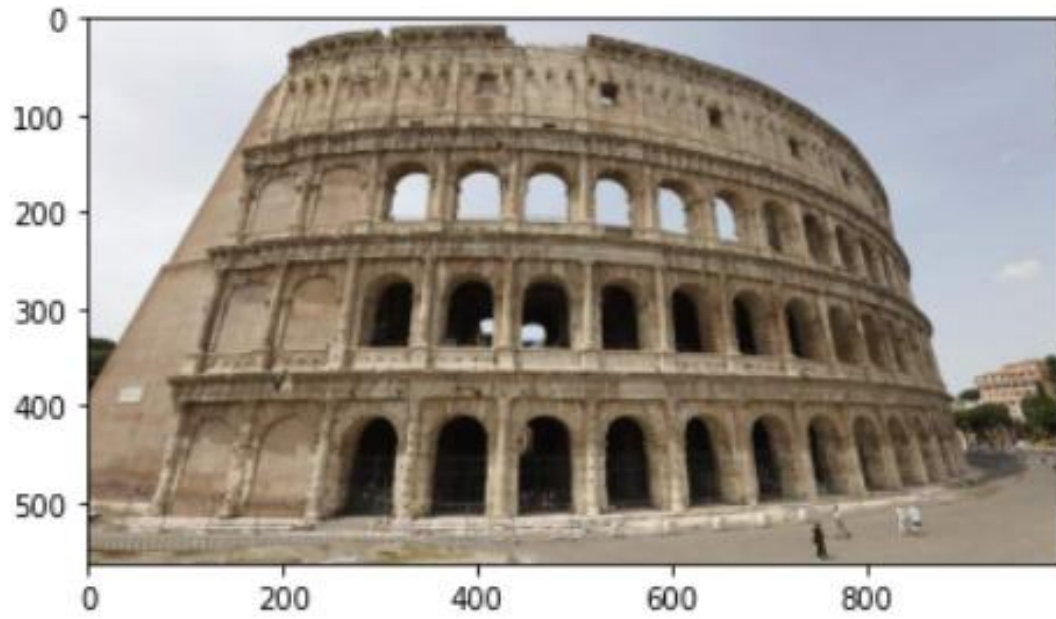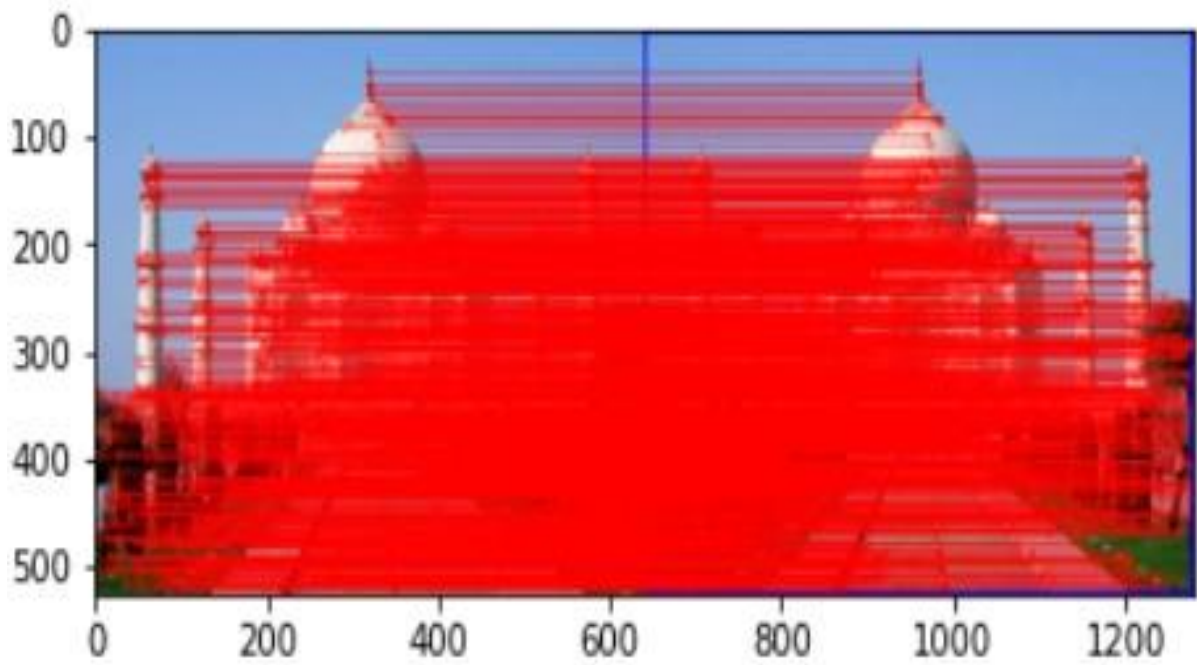

Figure 7: Rank3 match image
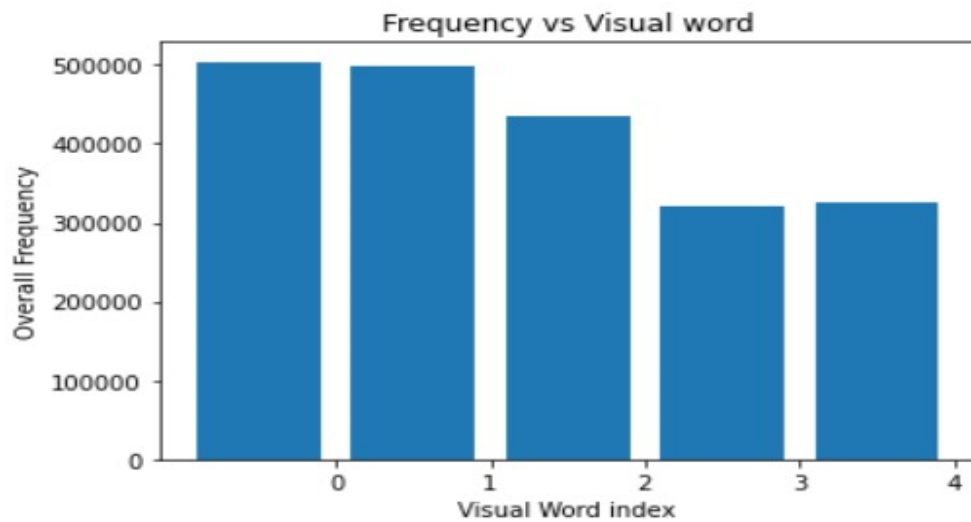
Figure 8: Histogram constructed

TIME TAKEN FOR MATCHING: 1.034 seconds

PART 3: MULTIMODAL SEARCH ENGINE

Query is image
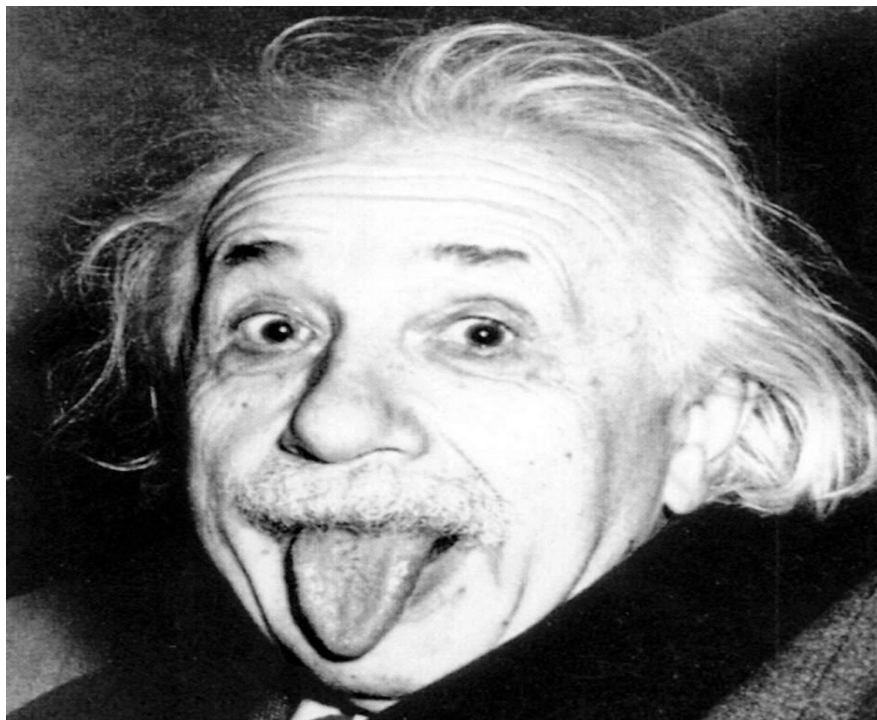
**Figure 9: Query Image**

Results
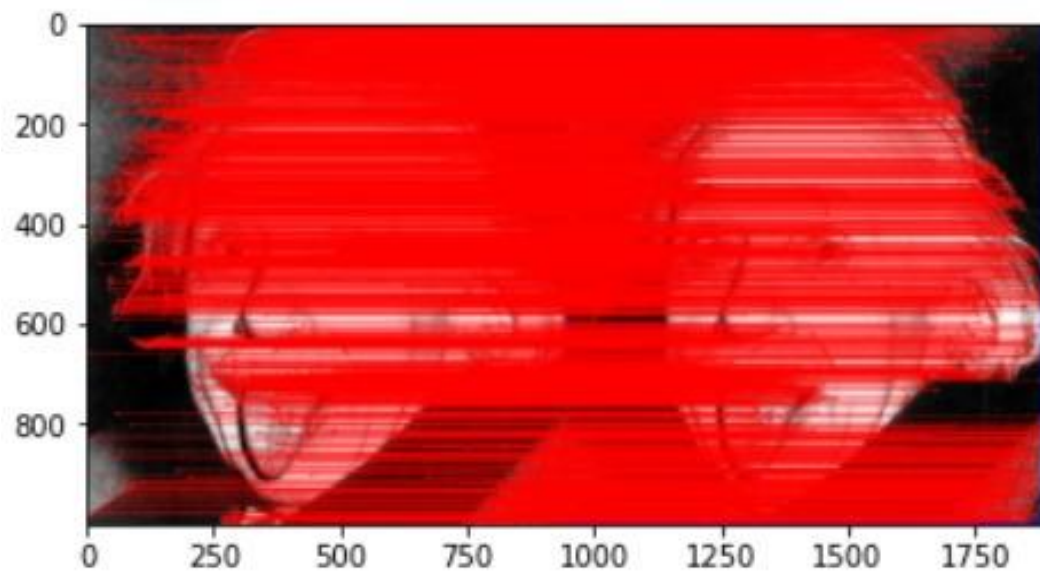
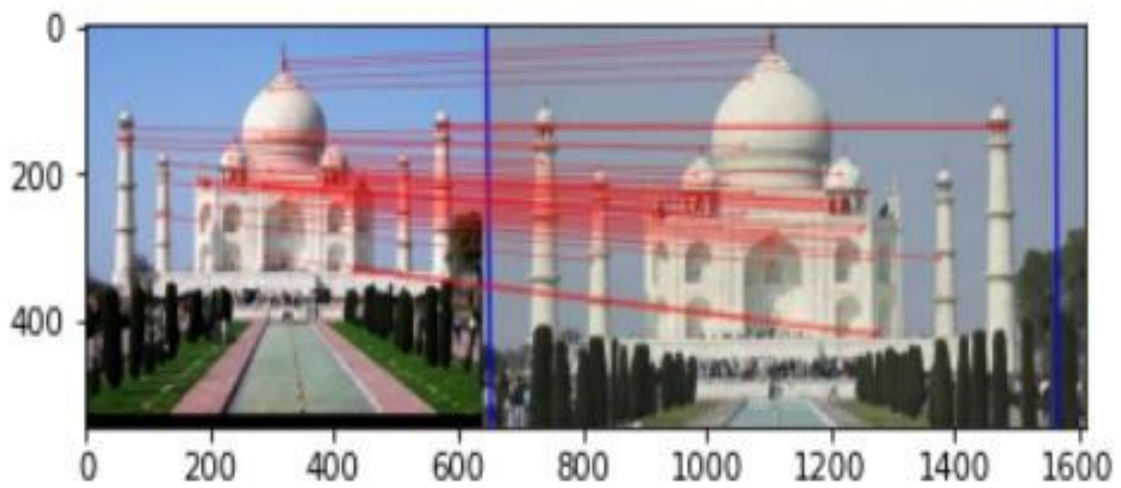**Figure 10: Rank3 match image**
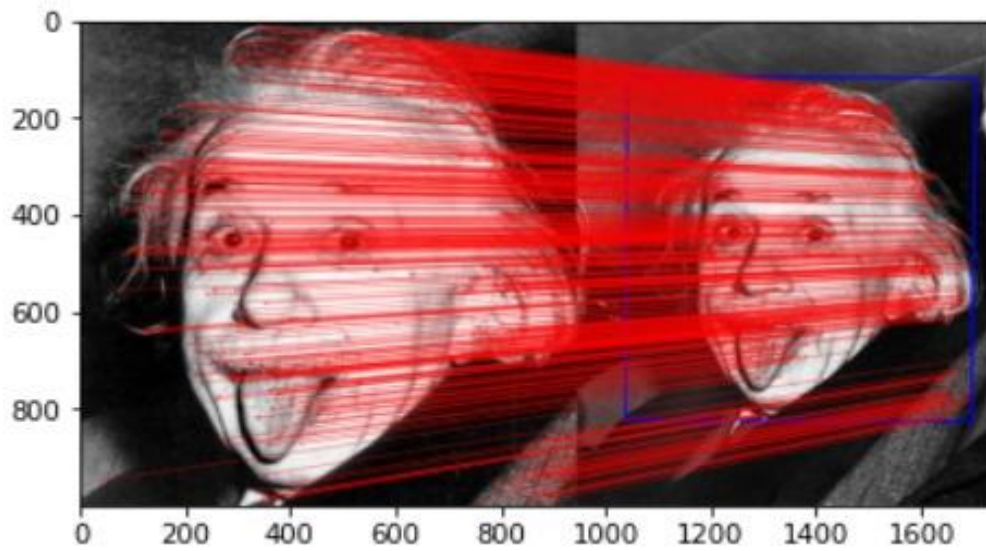
Figure 11: Rank3 match image
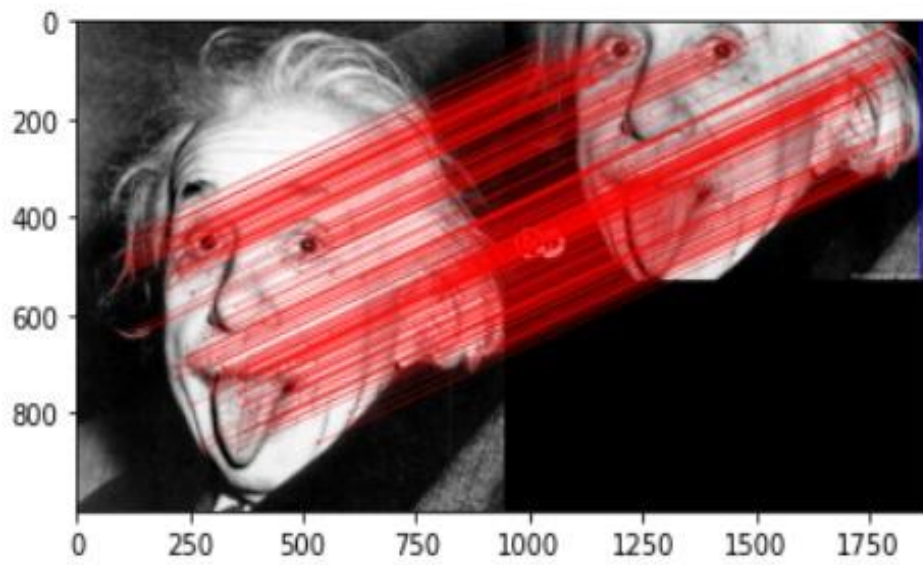
Figure 12: Rank3 match image

Figure 13: Rank3 match image

OUTPUT FOR TEST SET OF 30 WORDS

PART 2: IMAGE SEARCH ENGINE
FOR SIFT

Figure 14: Query Image

Results of SIFT

Figure 15: Rank1 match image

Figure 16: Rank2 match image


Figure 17: Rank3 match image

TIME TAKEN FOR MATCHING: 112.93 seconds

FOR BAG OF VISUAL WORDS

Figure 18: Query Image

Results of BAG OF VISUAL WORDS

Figure 19: Rank1 match image

Figure 20: Rank2 match image

Figure 21: Rank3 match image

Figure 22: Rank4 match image
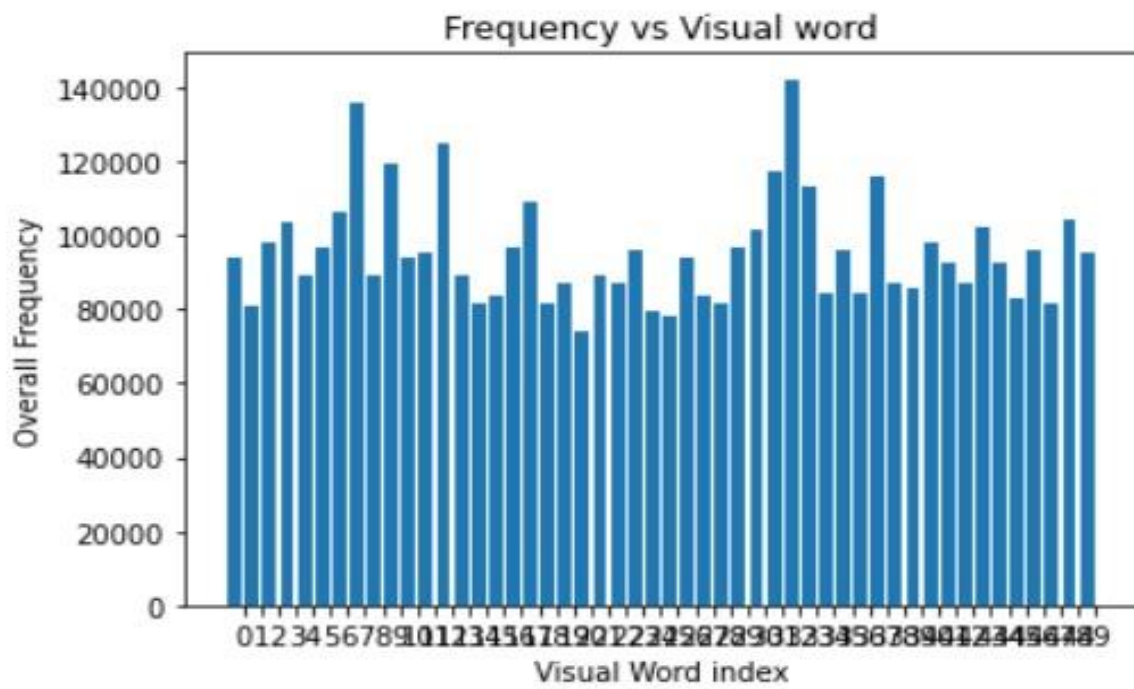
Figure 23: Histogram

TIME TAKEN FOR MATCHING: 2.09 seconds

PART 3: MULTIMODAL SEARCH ENGINE

Query is image

Figure 24: Query Image

Results

Figure 25: Rank1 match image
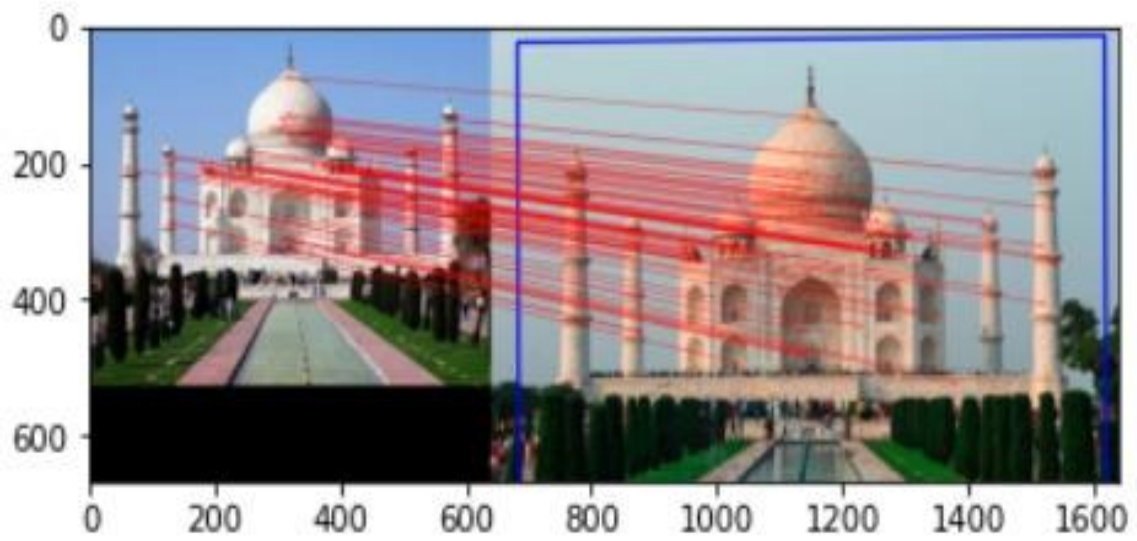
Figure 26: Rank2 match image

Figure 27: Rank3 match image
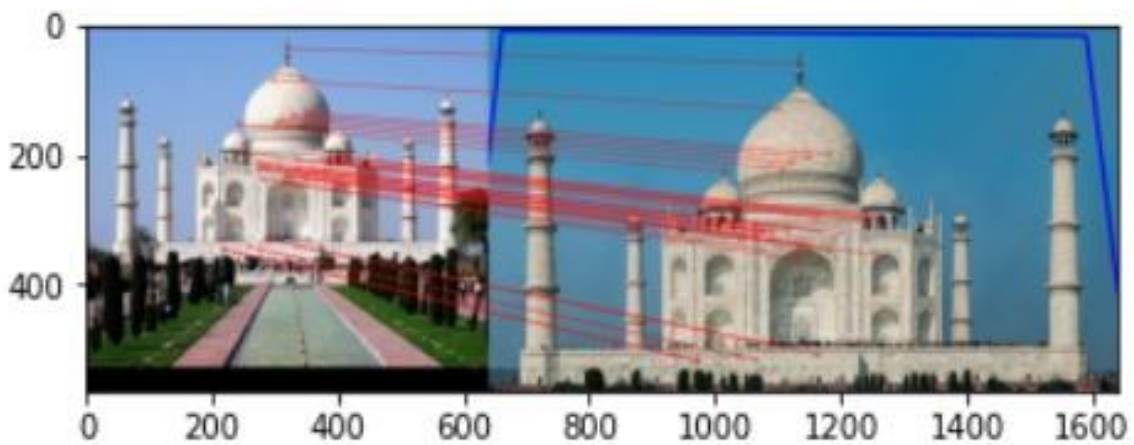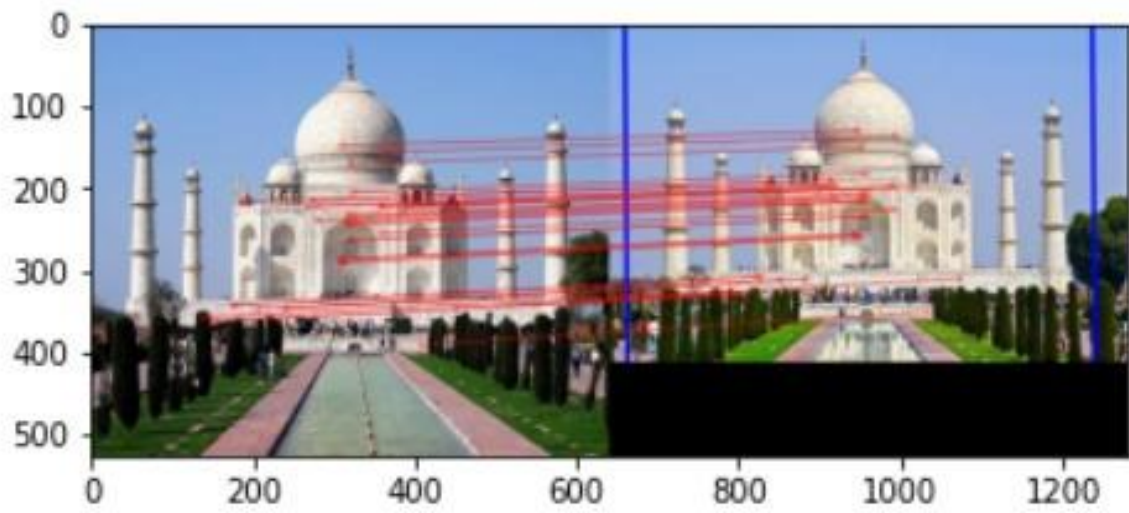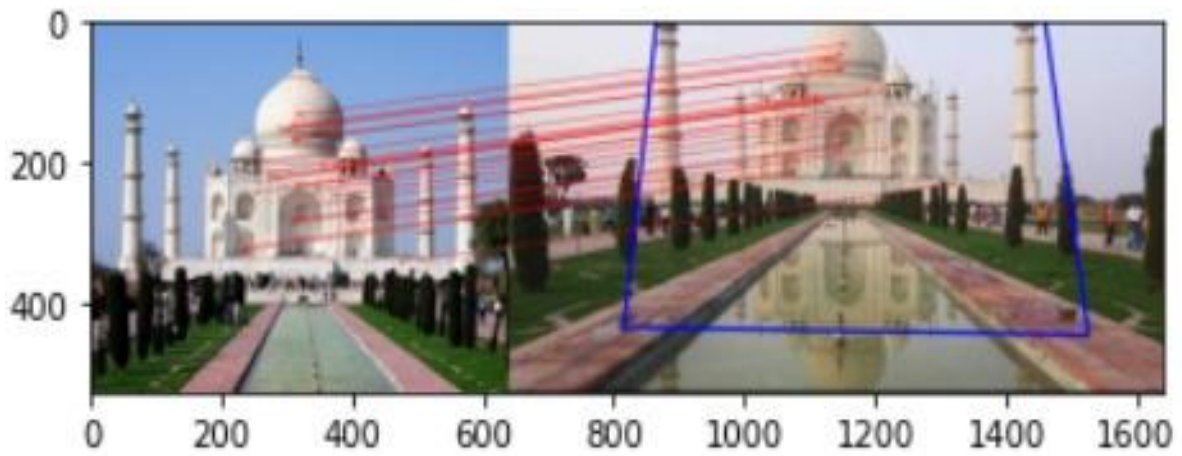

Figure 28: Rank4 match image

Figure 29: Rank5 match image

Figure 30: Rank6 match image