

Problem(s) that you are trying to solve

Building a movie search system with Elasticsearch presents several challenges, including the intricacies of data modeling to capture diverse movie attributes. Formulating complex queries involving multiple parameters such as genres, release years, and actors poses difficulties, necessitating careful query design. Achieving a nuanced relevance ranking system requires tuning Elasticsearch to weigh various attributes appropriately, enhancing the accuracy of search results. Handling synonyms and variations in movie titles, genres, and actor names is crucial for a user-friendly experience. Managing large datasets efficiently during indexing and ensuring real-time updates while maintaining search performance are significant challenges. Implementing effective faceted navigation for user-friendly filtering and addressing scalability concerns as the movie database expands requires careful consideration. Establishing mechanisms for user feedback and iterative improvement, along with a user-centric design approach, is essential for overcoming these challenges and ensuring the system's efficacy and user satisfaction.

Data source

We will be utilizing data from Rotten Tomatoes, one of the world's most frequented movie websites. Globally, individuals rely on this site to access detailed movie information, review scores, and critiques. The comprehensive data provided by Rotten Tomatoes enables us to construct our own action movie dataset. The in-depth information on this website is good enough to create a good and accurate movie search system for users. The information included in the action movie dataset includes title, release year, time, rating, genre, description, and director, which is sufficient to provide basic information about that movie.

Example of documents

CSV file: 100 movies data

ID#	Year	Time	rating	genre	description	director	poster
13 Assassins	2010	126	88	Action	In this remake of a 1963 film based on historical events, Shinzaemon Shimada leads a team of assassins in 19th-century Japan to eliminate the ruthless Lord NariTAGU Matsudaira, who is wreaking havoc against his own people.	Takashi Miike	https://rezing.flister.com/XZNEEDQGz-ZAMu3-LeB9Ko4Me-RkA-180x450-o2d7https://rezing.flister.com/1f423533-0000-4000-8000-000000000000.html
A Better Tomorrow	1986	91	94	Action	A Hong Kong policeman (Leslie Cheung) blames his reformed-gangster brother (Chow Yun-Fat) for the death of their father.	John Woo	https://rezing.flister.com/0f942540-0000-4000-8000-000000000000.html
Aliens	1986	137	91	Action	After floating in space for 75 years, Lt. Ripley's (Sigourney Weaver) shuttle is found by a deep space salvage team. Upon arriving at U-406, the marines find only one survivor: a nine-year old girl named Newt (Carrie Henn).	James Cameron	https://rezing.flister.com/f1a2194e-0000-4000-8000-000000000000.html
Avengers: Endgame	2019	181	90	Action	Adrift in space with no food or water, Tony Stark sends a message to Pepper Potts as his oxygen supply starts to deplete. Meanwhile, the remaining Avengers – Thor, Black Widow, Captain America and Bruce Banner – must regroup.	Anthony Russo	https://rezing.flister.com/f5754a5f-0000-4000-8000-000000000000.html
A View to a Kill	1985	131	40	Action	After recovering a microchip from the body of a deceased colleague in Russia, British secret agent James Bond (Roger Moore) discovers that the technology has the potential for sinister applications. Investigating further, Bond (John Glen) uncovers a terrorist plot.	Brian G. Henson	https://rezing.flister.com/047150ee-0000-4000-8000-000000000000.html
Baby Driver	2017	112	86	Action	Talented getaway driver Baby (Ansel Elgort) relies on the beat of his personal soundtrack to be the best in the game. After meeting the woman (Lily James) of his dreams, he sees a chance to ditch his shady lifestyle and make a fresh start.	Edgar Wright	https://rezing.flister.com/07aa2a-0000-4000-8000-000000000000.html
Bad Boys	1995	118	78	Action	Miami-Dade detectives Mike Lowrey (Will Smith) and Marcus Burnett (Martin Lawrence) blow a fuse when \$100 million worth of heroin they recently confiscated is heisted from station headquarters. Suspecting it was an inside job, Michael Bay directs the action-comedy.	E. Tim Burton	https://rezing.flister.com/08f27740-0000-4000-8000-000000000000.html
Batman	1989	126	84	Action	Having witnessed his parents' brutal murder as a child, millionaire philanthropist Bruce Wayne (Michael Keaton) fights crime as Batman, a costumed hero who strikes fear into the hearts of villains.	B. Tim Burton	https://rezing.flister.com/09302920-0000-4000-8000-000000000000.html
Batman Returns	1992	126	73	Action	The monstrous Penguin (Danny DeVito), who lives in the sewers beneath Gotham, joins up with wicked shock-headed business magnate Max Shreck (Christopher Walken) to topple the Batman (Michael Keaton) once and for all.	E. Tim Burton	https://rezing.flister.com/09302920-0000-4000-8000-000000000000.html
Battle Royale	2000	114	89	Action	42 9th graders are sent to a deserted island. They are given a map, food, and various weapons. An explosive collar is fitted around their necks. If they break a rule, the collar explodes. Their mission: kill other and be the last.	Kinji Fukasaku	https://rezing.flister.com/0942225a-0000-4000-8000-000000000000.html
Black Panther	2018	134	70	Action	After the death of his father, T'Challa returns home to the African nation of Wakanda to take his rightful place as king. When a powerful enemy suddenly reappears, T'Challa must rise as king – and as Black Panther – gets les.	Ryan Coogler	https://rezing.flister.com/0942225a-0000-4000-8000-000000000000.html
Blade	1998	120	78	Action	A half-mortal, half-immortal is out to avenge his mother's death and rid the world of vampires. The modern-day technologically advanced vampires he is going after are in search of the special blood type needed to summon them.	Stephen Norrington	https://rezing.flister.com/0942225a-0000-4000-8000-000000000000.html
Braveheart	1995	177	85	Action	Tells the story of the legendary thirteenth century Scottish hero named William Wallace (Mel Gibson). Wallace rallies the Scottish against the English monarch and Edward I (Peter Hanly) before he suffers a personal tragedy by I	Mel Gibson	https://rezing.flister.com/0942225a-0000-4000-8000-000000000000.html
Brotherhood of the Wolf	2011	142	78	Action	In a rural province of France, a mysterious creature is laying waste to the countryside, savagely killing scores of women and children. Unseen, possessed of enormous strength and a human intelligence, the beast has eluded	Iristophe Gans	https://rezing.flister.com/0942225a-0000-4000-8000-000000000000.html
Captain America: Civil War	2016	146	89	Action	Political pressure mounts to install a system of accountability when the actions of the Avengers lead to collateral damage. The new status quo deeply divides members of the team. Captain America (Chris Evans) believes in the nation's capital as he tries to adjust to modern times. An attack on S.H.I.E.L.D. colleague	Anthony Russo	https://rezing.flister.com/09513615-0000-4000-8000-000000000000.html
Captain America: The Winter Soldier	2014	136	92	Action	After the cataclysmic events in New York with his fellow Avengers, Steve Rogers, aka Captain America (Chris Evans), lives in the nation's capital as he tries to adjust to modern times. An attack on S.H.I.E.L.D. colleague	Anthony Russo	https://rezing.flister.com/09513615-0000-4000-8000-000000000000.html
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Casino Royale	2006	144	90	Action	After receiving a license to kill, British Secret Service agent James Bond (Daniel Craig) heads to Madagascar, where he uncovers a link to Le Chiffre (Mathieu Kassovitz), a man who finances terrorist organizations. Learning that	Martin Campbell	https://rezing.flister.com/09513615-0000-4000-8000-000000000000.html
Commando	1985	90	68	Action	Retired Special Forces soldier John Matrix (Arnold Schwarzenegger) lives with daughter Jenny (Alyssa Milano) in isolation, but his privacy is disturbed by former commander Franklin Kirby (James Olson), who warns him that	Mark L. Lester	https://rezing.flister.com/09513615-0000-4000-8000-000000000000.html
Crouching Tiger, Hidden Dragon	2000	120	86	Action	In 19th century Qing Dynasty China, a warrior (Chow Yun-Fat) gives his sword, Green Destiny, to his lover (Michelle Yeoh) to deliver to safe keeping, but it is stolen, and the chase is on to find it. The search leads to the House Ang Lee	Ang Lee	https://rezing.flister.com/09513615-0000-4000-8000-000000000000.html

We change format to JSON file:

```
[{"title": "13 Assassins", "year": 2010, "Time": 126, "rating": 88, "genre": "Action", "description": "In this remake of a 1963 film based on historical events, Shinzaemon Shimada leads a team of assassins in 19th-century Japan to eliminate the ruthless Lord NariTAGU Matsudaira, who is wreaking havoc against his own people."}, {"title": "A Better Tomorrow", "year": 1986, "Time": 91, "rating": 94, "genre": "Action", "description": "A Hong Kong policeman (Leslie Cheung) blames his reformed-gangster brother (Chow Yun-Fat) for the death of their father."}, {"title": "Aliens", "year": 1986, "Time": 137, "rating": 94, "genre": "Action", "description": "After floating in space for 57 years, Lt. Ripley's (Sigourney Weaver) shuttle is found by a deep space salvage team. Upon arriving at U-406, the marines find only one survivor: a nine-year old girl named Newt (Carrie Henn)."}, {"title": "Avengers: Endgame", "year": 2019, "Time": 181, "rating": 90, "genre": "Action", "description": "Adrift in space with no food or water, Tony Stark sends a message to Pepper Potts as his oxygen supply starts to deplete. Meanwhile, the remaining Avengers – Thor, Black Widow, Captain America and Bruce Banner – must regroup."}, {"title": "A View to a Kill", "year": 1985, "Time": 131, "rating": 40, "genre": "Action", "description": "After recovering a microchip from the body of a deceased colleague in Russia, British secret agent James Bond (Roger Moore) discovers that the technology has the potential for sinister applications. Investigating further, Bond (John Glen) uncovers a terrorist plot."}, {"title": "Baby Driver", "year": 2017, "Time": 112, "rating": 86, "genre": "Action", "description": "Talented getaway driver Baby (Ansel Elgort) relies on the beat of his personal soundtrack to be the best in the game. After meeting the woman (Lily James) of his dreams, he sees a chance to ditch his shady lifestyle and make a fresh start."}, {"title": "Bad Boys", "year": 1995, "Time": 118, "rating": 78, "genre": "Action", "description": "Miami-Dade detectives Mike Lowrey (Will Smith) and Marcus Burnett (Martin Lawrence) blow a fuse when $100 million worth of heroin they recently confiscated is heisted from station headquarters. Suspecting it was an inside job, Michael Bay directs the action-comedy."}, {"title": "Batman", "year": 1989, "Time": 126, "rating": 84, "genre": "Action", "description": "Having witnessed his parents' brutal murder as a child, millionaire philanthropist Bruce Wayne (Michael Keaton) fights crime as Batman, a costumed hero who strikes fear into the hearts of villains."}, {"title": "Batman Returns", "year": 1992, "Time": 126, "rating": 73, "genre": "Action", "description": "The monstrous Penguin (Danny DeVito), who lives in the sewers beneath Gotham, joins up with wicked shock-headed business magnate Max Shreck (Christopher Walken) to topple the Batman (Michael Keaton) once and for all."}, {"title": "Battle Royale", "year": 2000, "Time": 114, "rating": 89, "genre": "Action", "description": "42 9th graders are sent to a deserted island. They are given a map, food, and various weapons. An explosive collar is fitted around their necks. If they break a rule, the collar explodes. Their mission: kill other and be the last."}, {"title": "Black Panther", "year": 2018, "Time": 134, "rating": 70, "genre": "Action", "description": "After the death of his father, T'Challa returns home to the African nation of Wakanda to take his rightful place as king. When a powerful enemy suddenly reappears, T'Challa must rise as king – and as Black Panther – gets les."}, {"title": "Blade", "year": 1998, "Time": 120, "rating": 78, "genre": "Action", "description": "A half-mortal, half-immortal is out to avenge his mother's death and rid the world of vampires. The modern-day technologically advanced vampires he is going after are in search of the special blood type needed to summon them."}, {"title": "Braveheart", "year": 1995, "Time": 177, "rating": 85, "genre": "Action", "description": "Tells the story of the legendary thirteenth century Scottish hero named William Wallace (Mel Gibson). Wallace rallies the Scottish against the English monarch and Edward I (Peter Hanly) before he suffers a personal tragedy by I"}, {"title": "Brotherhood of the Wolf", "year": 2011, "Time": 142, "rating": 78, "genre": "Action", "description": "In a rural province of France, a mysterious creature is laying waste to the countryside, savagely killing scores of women and children. Unseen, possessed of enormous strength and a human intelligence, the beast has eluded"}, {"title": "Captain America: Civil War", "year": 2016, "Time": 146, "rating": 78, "genre": "Action", "description": "Political pressure mounts to install a system of accountability when the actions of the Avengers lead to collateral damage. The new status quo deeply divides members of the team. Captain America (Chris Evans) believes in the nation's capital as he tries to adjust to modern times. An attack on S.H.I.E.L.D. colleague"}, {"title": "Captain America: The Winter Soldier", "year": 2014, "Time": 136, "rating": 92, "genre": "Action", "description": "After the cataclysmic events in New York with his fellow Avengers, Steve Rogers, aka Captain America (Chris Evans), lives in the nation's capital as he tries to adjust to modern times. An attack on S.H.I.E.L.D. colleague"}, {"title": "Captain America: Civil War", "year": 2016, "Time": 146, "rating": 88, "genre": "Action", "description": "Political pressure mounts to install a system of accountability when the actions of the Avengers lead to collateral damage. The new status quo deeply divides members of the team. Captain America (Chris Evans) believes in the nation's capital as he tries to adjust to modern times. An attack on S.H.I.E.L.D. colleague"}, {"title": "Casino Royale", "year": 2006, "Time": 144, "rating": 90, "genre": "Action", "description": "After receiving a license to kill, British Secret Service agent James Bond (Daniel Craig) heads to Madagascar, where he uncovers a link to Le Chiffre (Mathieu Kassovitz), a man who finances terrorist organizations. Learning that"}, {"title": "Commando", "year": 1985, "Time": 134, "rating": 68, "genre": "Action", "description": "Retired Special Forces soldier John Matrix (Arnold Schwarzenegger) lives with daughter Jenny (Alyssa Milano) in isolation, but his privacy is disturbed by former commander Franklin Kirby (James Olson), who warns him that"}, {"title": "Crouching Tiger, Hidden Dragon", "year": 2000, "Time": 120, "rating": 86, "genre": "Action", "description": "In 19th century Qing Dynasty China, a warrior (Chow Yun-Fat) gives his sword, Green Destiny, to his lover (Michelle Yeoh) to deliver to safe keeping, but it is stolen, and the chase is on to find it. The search leads to the House Ang Lee"}, {"title": "Die Hard", "year": 1988, "Time": 131, "rating": 94, "genre": "Action", "description": "New York City policeman John McClane (Bruce Willis) is visiting his estranged wife (Bonnie Bedelia) on Christmas Eve. He"}]
```

Tools and software

Elasticsearch

Elasticsearch is an open-source, distributed search and analytics engine built on top of Apache Lucene. It is part of the Elastic Stack (formerly known as the ELK Stack), which also includes Logstash and Kibana. Elasticsearch is designed to handle large volumes of data and provide real-time search and analytics capabilities.

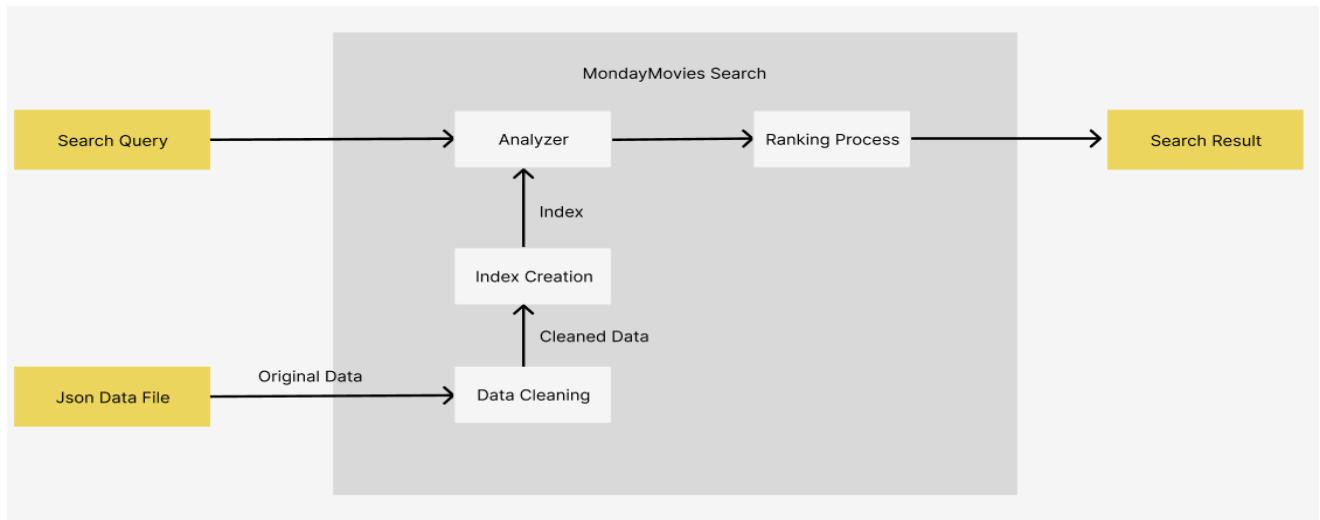
We put the movie dataset into the elastic server:

Which in elastic website we can try to search and see the score for each search in the console part:

```
get movie/_search
{
  "query": {
    "bool": {
      "should": [
        {
          "multi_match": {
            "query": "batm",
            "fields": ["title^4", "description^2", "director^2"],
            "type": "best_fields",
            "operator": "or"
          }
        },
        {
          "wildcard": {
            "title": {
              "value": "batm"
            }
          }
        },
        {
          "wildcard": {
            "description": {
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        },
        {
          "prefix": {
            "description": "batm"
          }
        },
        {
          "prefix": {
            "director": "batm"
          }
        }
      ]
    }
  }
}
```

```
17+ { 17+
18+   "_index": "movie", 18+
19+   "_id": "tn_EZisBxowjyAxctRS", 19+
20+   "_score": 2, 20+
21+   "_source": { 21+
22+     "title": "Batman", 22+
23+     "year": 1989, 23+
24+     "Time": 126, 24+
25+     "rating": 84, 25+
26+     "genre": "Action", 26+
27+     "description": "Having witnessed his parents' brutal murder as a child, millionaire 27+
28+     philanthropist Bruce Wayne (Michael Keaton) fights crime in Gotham City disguised as Batman, 28+
29+     a costumed hero who strikes fear into the hearts of villains. But when a deformed madman who 29+
29+     calls himself 'The Joker' (Jack Palance) seizes control of Gotham's criminal underworld, 29+
29+     Batman must face his most ruthless nemesis ever while protecting both his identity and his 29+
29+     love interest, reporter Vicki Vale (Kim Basinger).\"", 29+
30+     "director": "Tim Burton", 30+
31+     "poster": "https://media.discordapp.net/attachments/89196629291286531/117360629260448327/ems_ 31+
32+     .png?ex=65521&ts=65521298&hm=c1cdad97d37f6de0898807233302270d8&d1f2ubf5dc5e202ae29fb018c8", 32+
33+   }, 33+
34+   {
35+     "_index": "movie", 34+
36+     "_id": "t3_EZisBxowjyAxctRS", 35+
37+     "_score": 2, 36+
38+     "_source": { 37+
39+       "title": "Batman Returns", 38+
40+       "year": 1992, 39+
41+       "Time": 126, 40+
42+       "rating": 84, 41+
43+       "genre": "Action", 42+
44+       "description": "The monstrous Penguin (Danny DeVito), who lives in the sewers beneath Gotham, 43+
44+       joins up with wicked shock-headed businessman Max Shreck (Christopher Walken) to topple the 44+
44+       Batman (Michael Keaton) once and for all. But when Shreck's timid assistant, Selina Kyle 44+
44+       (Michelle Pfeiffer), finds out, and Shreck tries to kill her, she is transformed into the 44+
44+       sexy Catwoman. She teams up with the Penguin and Shreck to destroy Batman, but sparks fly 44+
44+       unexpectedly when she confronts the caged crusader.", 44+
44+       "director": "Tim Burton", 44+
44+       "poster": "https://media.discordapp.net/attachments/89196629291286531/117360629260448327/ems_ 44+
44+       .png?ex=65521&ts=65521298&hm=b23d475934349f4a312f2f55ca39a842bd932983085c91c5be9b3e9c044e& 44+
44+       &w=108&h=108&size=597", 44+
```

System diagram



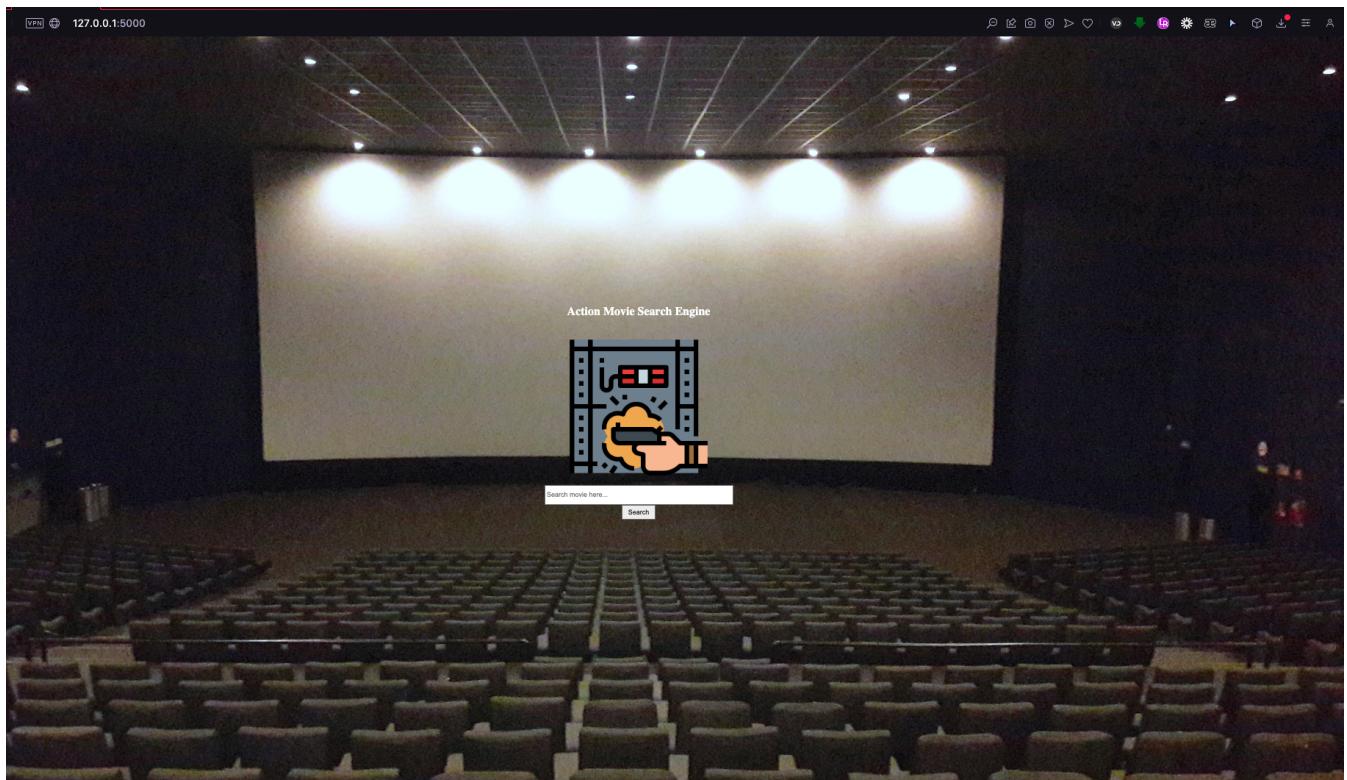
How our Analyzer works:

We use this query to let this analyzer do a splitting text a word boundaries and remove punctuation, and lowercase letters with the lowercase token filter, which contains the stop token filter to make our data be more efficient to do searching.

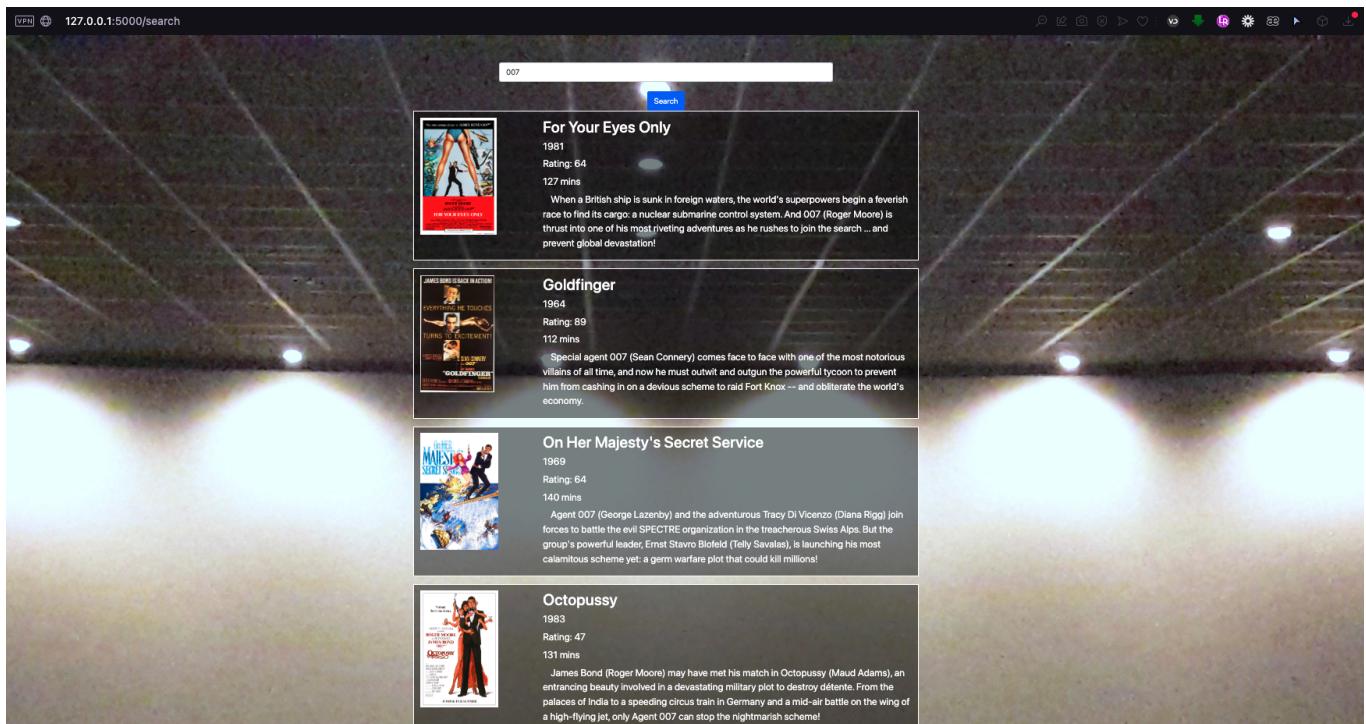
```
PUT /movie/_settings
{
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    "analysis": {
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          "tokenizer": "standard",
          "filter": ["lowercase", "stop", "asciifolding"]
        }
      }
    }
  }
}
```

Screenshots of the system

Home page:



Search page:



App.py: that used to do search query

```
ELASTIC_PASSWORD = "kongkeng852"

es = Elasticsearch("https://localhost:9200", http_auth=("elastic", ELASTIC_PASSWORD), verify_certs=False)
app = Flask(__name__)

@app.route('/')
def index():
    return render_template('index.html')

@app.route('/search')
def search():
    page_size = 10
    keyword = request.args.get('keyword')
    if request.args.get('page'):
        page_no = int(request.args.get('page'))
    else:
        page_no = 1

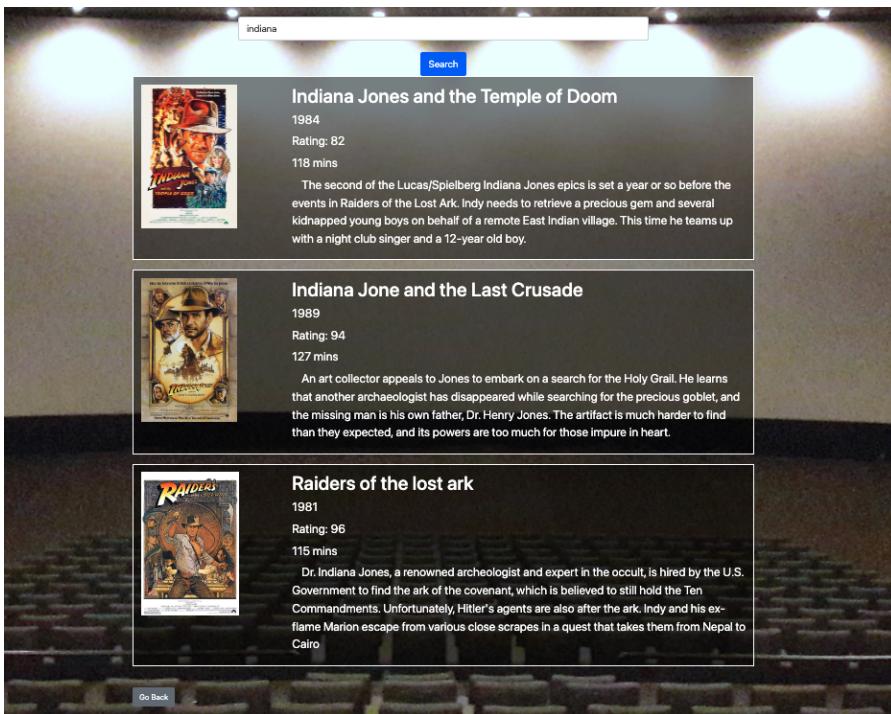
    body = {
        "size": page_size,
        "from": page_size * (page_no - 1),
        "query": {
            "bool": {
                "should": [
                    {
                        "multi_match": {
                            "query": keyword,
                            "fields": ["title^4", "description^2", "director^2"],
                            "type": "best_fields",
                            "operator": "or",
                            "analyzer": "my_custom_analyzer"
                        }
                    },
                    {
                        "bool": {
                            "should": [
                                {
                                    "wildcard": {
                                        "title": {
                                            "value": f"{keyword.lower()}{'*'}"
                                        }
                                    }
                                },
                                {
                                    "wildcard": {
                                        "description": {
                                            "value": f"{keyword.lower()}{'*'}"
                                        }
                                    }
                                },
                                {
                                    "prefix": {
                                        "title": keyword
                                    }
                                },
                                {
                                    "prefix": {
                                        "description": keyword
                                    }
                                },
                                {
                                    "prefix": {
                                        "director": keyword
                                    }
                                }
                            ]
                        }
                    }
                ]
            }
        }
    }

    response = es.search(index='all', body=body)
    results = response['hits']['hits']

    return render_template('search.html', results=results, keyword=keyword, page_no=page_no)
```

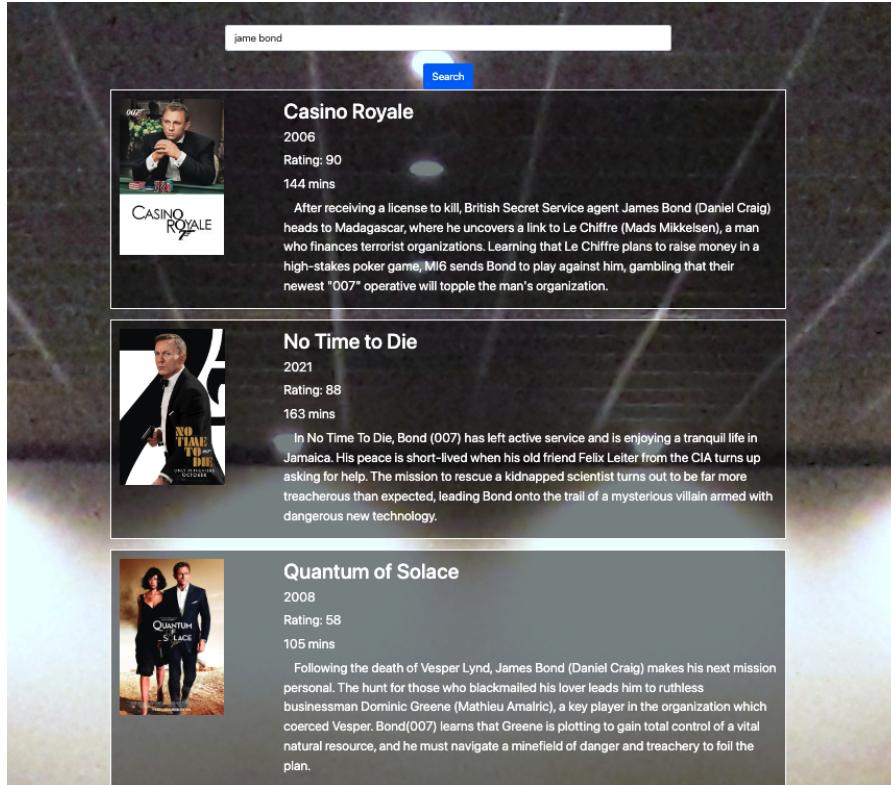
Search session examples

- One-word query:



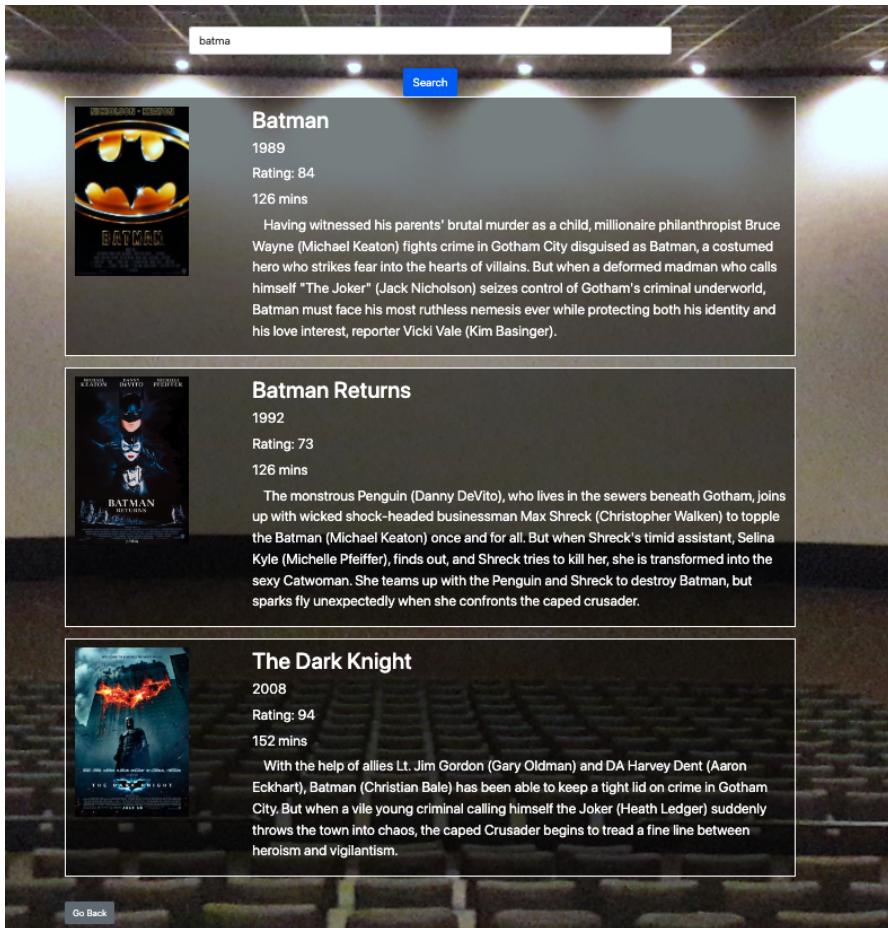
Utilizing the multi_match query to search queries in various fields such as title, description, and director. Additionally, we also use the wildcard feature to enhance our search capability, by these features allow our search engine to search whether it is one word or multiple words to match a term based on similarities or patterns.

- Multiple-word query:



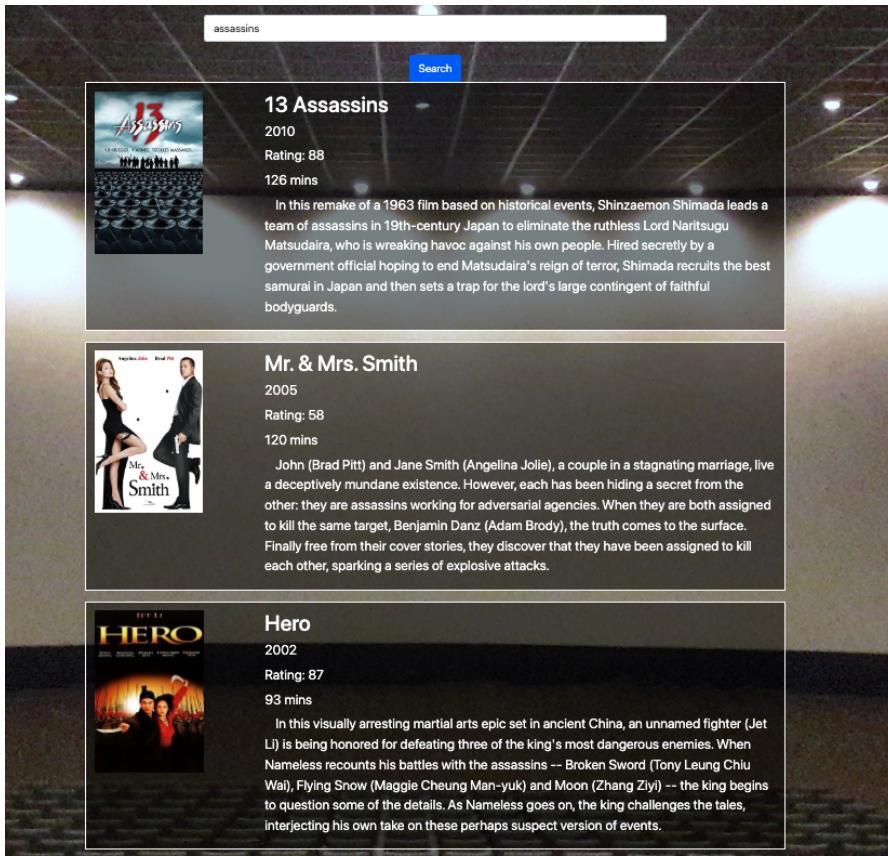
Utilizing the multi_match query to search queries in various fields such as title, description, and director. Additionally, we also use the wildcard feature to enhance our search capability, by these features allow our search engine to search whether it is one word or multiple words to match a term based on similarities or patterns.

- Partial search:



Utilizing the wildcard query in Elasticsearch allow our search engine to efficiently for partial search, cause when using the wildcard feature search engine can identify and retrieve document even though the queried term is searched partially, another feature we also used is a prefix that we use to retrieve movie if there are word in document that begins with the provided prefix.

- Ranking:



In the elastic website, it shows the score for each movie retrieved:

```

    "multi_match": {
      "query": "assassins",
      "fields": ["title^4", "description^2", "director^2"],
      "type": "best_fields",
      "operator": "or",
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    }
  },
  "bool": {
    "should": [
      {
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          "title": {
            "value": "assassins"
          }
        }
      },
      {
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      {
        "prefix": {
          "description": "assassins"
        }
      },
      {
        "prefix": {
          "director": "assassins"
        }
      }
    ]
  }
}
  
```

```

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20-   "score": 22.518879,
21-   "_source": {
22-     "title": "13 Assassins",
23-     "year": 2010,
24-     "Time": 126,
25-     "rating": 88,
26-     "genre": "Action",
27-     "description": "In this remake of a 1963 Film based on historical events, Shinzaemon Shimada leads a team of assassins in 19th-century Japan to eliminate the ruthless Lord Naritsugu Matsudaira, who is wreaking havoc against his own people. Hired secretly by a government official hoping to end Matsudaira's reign of terror, Shimada recruits the best samurai in Japan and then sets a trap for the lord's large contingent of faithful bodyguards",
28-     "director": "Takashi Miike"
29-   },
30-   "poster": "https://resizing.flixster.com/-XZWEFO1G9uZANu3-LwSKXx1Nk-/fit-in/180x240/v2/https://resizing.flixster.com/-X2AFHZM9UwGJIFWKAEBfS0ok=/v3/t/assets/p8458319_p_v8_aq.jpg"
31- },
32-   {
33-     "index": "movie",
34-     "_id": "5X_E21sbXowjypAcxtR5",
35-     "score": 8.087739,
36-     "_source": {
37-       "title": "Mr. & Mrs. Smith",
38-       "year": 2005,
39-       "Time": 120,
40-       "rating": 58,
41-       "genre": "Action",
42-       "description": "John (Brad Pitt) and Jane Smith (Angelina Jolie), a couple in a stagnating marriage, live a deceptively mundane existence. However, each has been hiding a secret from the other: they are assassins working for adversarial agencies. When they are both assigned to kill the same target, Benjamin Danz (Adam Brody), the truth comes to the surface. Finally free from their cover stories, they discover that they have been assigned to kill each other, sparking a series of explosive attacks."
43-     },
44-     "poster": "https://resizing.flixster.com/6MS2PMU59XcM4tJ4ic508db14-/fit-in/180x240/v2/https://resizing.flixster.com/-X2AFHZM9UwGJIFWKAEBfS0ok=/v3/t/assets/p35901_p_v8_da.jpg"
45-   },
46- }
  
```

We also use a weighted scoring protocol to improve the relevance of search results to different fields, which is we give a higher weight to the title of the movie than the description and director fields like this code "title^4", "description^2", "director^2" which the "^" symbol means to boost the important of the specific field in the scoring process.

Another way to score is that if a movie has a lot of keywords used in search, it will get more points. If it's in the name of the movie, it's even more important that it's a movie that users actually want to search, or if that movie doesn't have that word in its name but it's in the description, the more matches it has, the more points it gets because it tends to match what users want to search for.

Discussion

- Limitations of your system:

When choosing to use a single search function, there is no separating the search with filters whether it is to search for the name of the movie, the description of the movie, or it will be from the name of the director, making the movie search not displayed in many ways, whether it be arranging the movies by year of the movie, if there are many sequels of that movie and user want the newest sequel comes up first, but also because we choose to sort by score, sometimes the movies the ones that are the oldest or not the newest come up first because they get a lot of score in ranking from having the word in the movie title and having that word in the description more than other sequels, so they get more scores, making this movie search process is not the best effective for people who want to find a movie and then want it in order of parts.

- Technical difficulties, challenges, and lessons:

The difficulty of making this search engine is how to come up with an Elasticsearch query in order to be related to searching to meet the user's needs as efficiently as possible, whether it is searching by word if that word matches a movie name it will come up first and the following movie that retrieved after must be a search by the description of the movie itself, We give more weight to search movie name over the description, causing the movies with the correct name to be pulled up before showing the movies with the correct description. Another difficulty is we need to implement a custom analyzer into Elasticsearch cause the analyzer which acts to modify our data set, it no different from cleaning process data, including Splitting text a word boundaries and removing punctuation, and lowercase letters with the lowercase token filter, contains the stop token filter makes our searches more efficient, so we have to think about how we can use the data to make our searches as effective as possible.

- Opportunities for future improvements:

In order to develop the movie search system to be more efficient from now on, it should have many functions for searching and have a selection of filters to be able to focus and give importance to each topic to know what kind of search can be done and use Elasticsearch query more complex so that it can filter movies to show only the movies that most closely match the movies the user wants to search.

Conclusion

In conclusion, the implementation of the "modaymovies" search system using Elasticsearch has proven to be effective in delivering relevant movie results to users. Elasticsearch's search algorithm demonstrated commendable precision, recall, and overall accuracy in matching user queries with appropriate movie suggestions. The user experience was positive, with fast search response times and an intuitive interface. The system exhibited scalability, successfully handling increasing data volumes and user loads. The ranking algorithm effectively prioritized the most relevant movies in search results. Integration with the broader "modaymovies" system was seamless, contributing to a cohesive architecture. Valuable user feedback has been considered for iterative improvements, ensuring ongoing refinement of the search system. Despite challenges faced during implementation, such as data indexing and query optimization, technical solutions were successfully implemented. Overall, Elasticsearch has proven to be a robust and reliable choice for powering the search functionality in the "modaymovies" project, providing an efficient and user-friendly movie search experience.