

CS552: Major Project Presentation



“Comprehensive Movie Review Analysis System using Microservice-architecture”

(CS-552: Introduction to Cloud Computing)

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Motivation



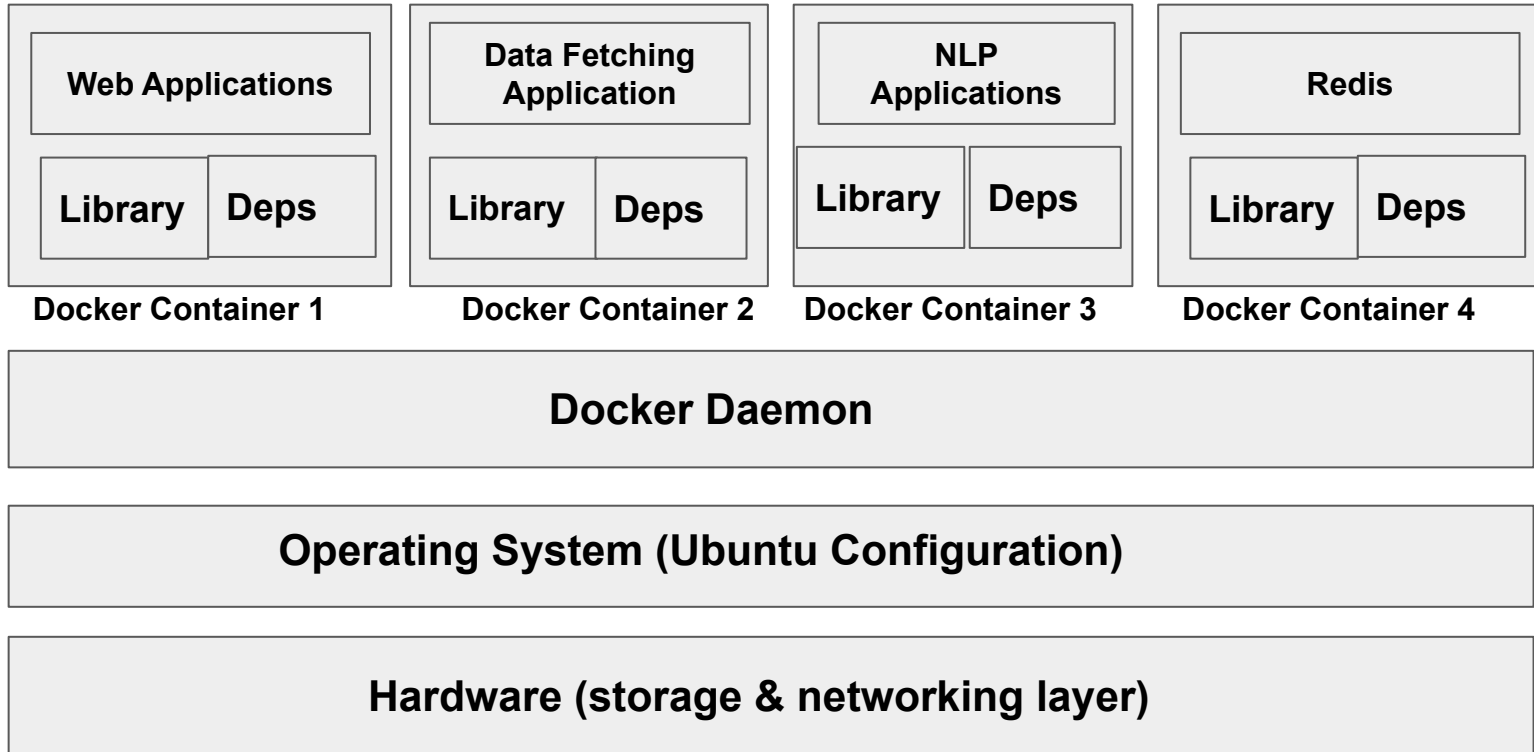
- Understanding the working of text-analytical system deployed on cloud.
- Deployment of several layer microservices architecture for NLP-based application.

Goals

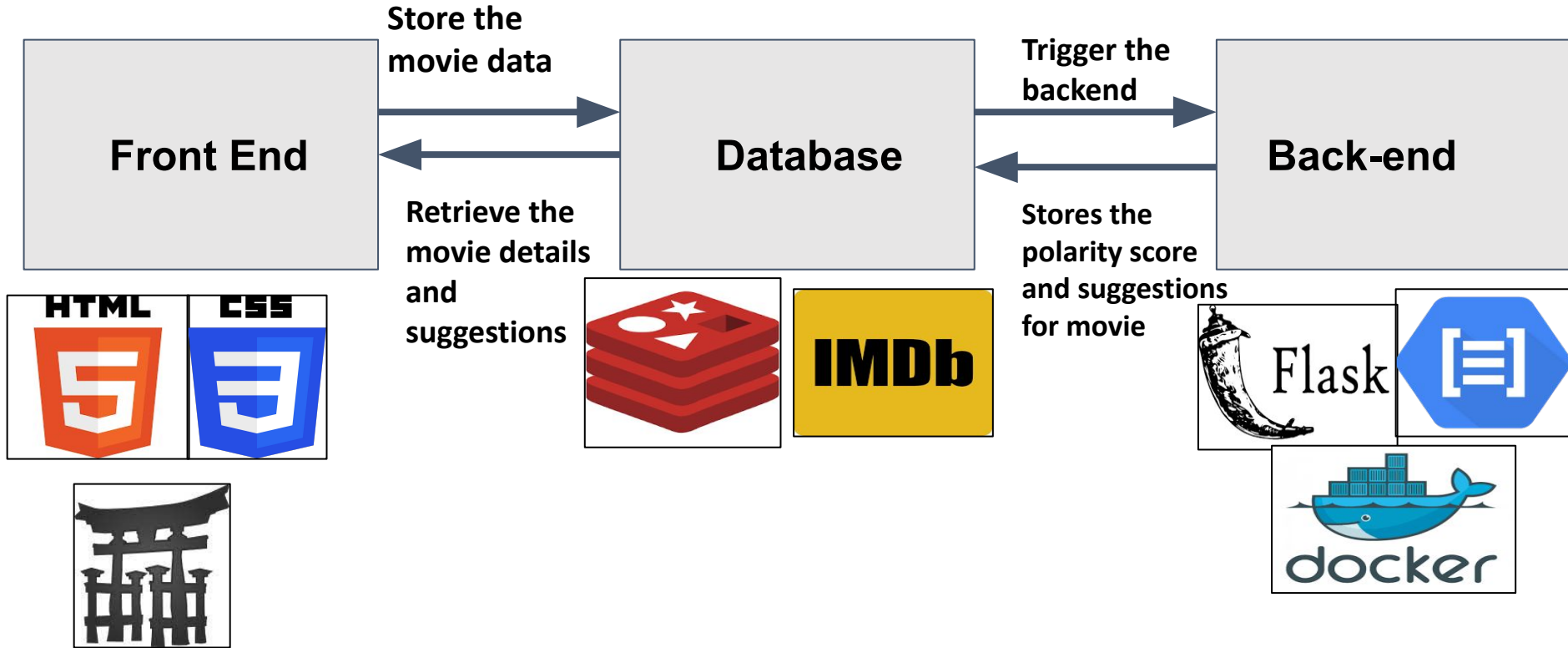


- Develop a movie reviews analysis system based on the services provided by Google cloud.
- To understand the working of microservices for process of data scraping, data storage and NLP-based applications.

Block Diagram



System Architecture



Implementation Steps

- **Step-1:** Set-up Redis in first docker container.
- **Step-2:** Set-up docker container for front-end.
- **Step-3:** Set-up container for Google Cloud NLP services.
- **Step-4:** Accept movie name and display movie details & verdict.



Setup 1: Set-up Redis in first container

- The data is in memory, which enables low latency.
- Flexible Data Structure used for data-storage.
- Entire movie-data is stored in this file.



Setup 2: Set-up docker container for front-end



- To enter the movie name.

Setup 3: Set-up container for Google NLP services

- **Containerize the Google Cloud NLP services.**
- **Polarity-** determines the sentimental aspect of an opinion.
 - > -1: extreme negative score
 - >+1: extreme positive score
 - >0: neutral sentiment
- **Magnitude-** how much it is differing from the absolute neutral (=0).



```
pavanreddy@final-project:~/CC-Project2-Final$ docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
1cfba996a230	nlp:v1	"sh run.sh"	41 minutes ago	Up 30 seconds	
92de77b926af	reviews:v1	"python3 getMovieRev..."	42 minutes ago	Up 23 seconds	
cbf487225d87	client:v1	"python3 getMovieNam..."	44 minutes ago	Up 30 seconds	0.0.0.0:3000->3000/tcp, :::3000->3000/tcp
9360eeefdc0e	redis	"docker-entrypoint.s..."	2 hours ago	Up 2 hours	0.0.0.0:6379->6379/tcp, :::6379->6379/tcp
5c4ef329508d	portainer/portainer-ce:2.9.3	"/portainer"	3 hours ago	Up 3 hours	0.0.0.0:8000->8000/tcp, :::8000->8000/tcp, 0.0.0.0:9443->9443/tcp, :::9443->9443/tcp, 9000/tcp

```
pavanreddy@final-project:~/CC-Project2-Final$
```

```
bash
bash
bash
```

List of all docker container running on Google Cloud Platform.

Scoring mechanism

- n := number of reviews in one API calls.
- p := polarity score for every review.
- M :=average score calculated for movie

$$M = \Sigma p / n$$


On the basis of M , the movie verdict will be calculated.



Setup 4: Display movie details & display movie verdict.

The image shows a mobile application interface for 'Movie Reviewer'. The background is a collage of movie-related items: a red and white striped popcorn bucket, a pile of white popcorn, and several red movie tickets with the word 'TICKET' and 'KEEP THIS COUPON' visible. In the top left corner, there is a pink circular logo with a white 'm' and the text 'Movie Reviewer'. The main content is displayed in a white rounded rectangle. It features a small movie poster for 'K.G.F: Chapter 2 (2022)' on the left. To the right of the poster, the title 'K.G.F: Chapter 2 (2022)' is written in a large, bold, black font. Below the title, the word 'Genres' is followed by 'Action Crime Drama'. The next section is 'Staring' (sic), followed by the names 'Yash ,Sanjay Dutt ,Srinidhi Shetty'. The 'Summary' section contains a paragraph: 'In the blood-soaked Kolar Gold Fields, Rocky's name strikes fear into his foes. While his allies look up to him, the government sees him as a threat to law and order. Rocky must battle threats from all sides for unchallenged supremacy.' The 'Verdict' section states: 'Based on the the reviews out algorithm predicts that this movie is a strongly recommended movie.' At the bottom left of the white box is a small yellow IMDb logo.

m Movie Reviewer


 **K.G.F: Chapter 2 (2022)**

Genres
Action Crime Drama

Staring
Yash ,Sanjay Dutt ,Srinidhi Shetty

Summary
In the blood-soaked Kolar Gold Fields, Rocky's name strikes fear into his foes. While his allies look up to him, the government sees him as a threat to law and order. Rocky must battle threats from all sides for unchallenged supremacy.

Verdict
Based on the the reviews out algorithm predicts that this movie is a strongly recommended movie.



Major Problem Faced



- **Synchronously working of Docker Containers.**
 - Used Flags/Triggers for setting up other containers.
- **Integrating Google Cloud NLP Services and IMDB API.**
 - Created separate containers for both.

Conclusion

- The current system is developed to suggest the movie recommendation based on the user comments on IMDB platform.
- We are using APIs to collect the movie reviews and movie trivia based on the IMDB public APIs.
- Used Redis an in-memory data structure store for storing comments and movie information.



Future Scope

- To create a recommendation system based on the users previous search history.
- To include and apply other NLP-based APIs for different purposes like segmentation speech recognition.
- To increase the number of reviews for movie review analysis system
- To add more statistical parameters to improve the rating mechanism.
- We can use orchestration as it creates replica for the containers and load balancing.



References

- [1] Tamrakar, S., Madhavi, B. K., & Mohan, V. (2022). Democratizing Sentiment Analysis of Twitter Data Using Google Cloud Platform and BigQuery. Handbook of Intelligent Computing and Optimization for Sustainable Development, 287-304.
- [2] Ghorbani, M., Bahaghighat, M., Xin, Q., & Özen, F. (2020). ConvLSTMConv network: a deep learning approach for sentiment analysis in cloud computing. Journal of Cloud Computing, 9(1), 1-12.
- [3] Brar, G. S., & Sharma, A. (2018). Sentiment analysis of movie review using supervised machine learning techniques. International Journal of Applied Engineering Research, 13(16), 12788-12791.
- [4] Redis Documentation. <https://redis.io/docs/>
- [5] Docker Documentation. <https://docs.docker.com/get-started/overview/>
- [6] Google Natural API Documentation. <https://cloud.google.com/natural-language/docs/apis>



An aerial photograph of a university campus, likely the University of Tennessee, showing various academic and residential buildings, green spaces, and surrounding forested hills. A large, white, sans-serif text "Thank You!" is centered over the image, with a thin vertical white line to its left.

Thank You!

An aerial photograph of a university campus, likely the University of Tennessee, showing various academic and residential buildings, green spaces, and surrounding forested hills. The text "Demo Session Q & A Session" is overlaid in white, with a vertical line to its left.

Demo Session Q & A Session