

LABORATORY REPORT
Application Development Lab
(CS33002)

B.Tech Program in ECSc

Submitted By

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Experiment Number	8
Experiment Title	Sentiment Prediction API Using FastAPI and Youtube -Comments
Date of Experiment	26.03.2025
Date of Submission	31.03.2025

1. Objective:-

The objective of this lab experiment is to create a sentiment prediction API using FastAPI, which analyzes Twitter tweets for positive, negative, or neutral sentiment. This lab integrates natural language processing (NLP) techniques with a lightweight and high- performance API framework.

2. Procedure:- (Steps Followed)

1. Set up FastAPI Backend:

Install required libraries: `pip install fastapi google-api-python-client textblob uvicorn` Create a FastAPI server (main.py) to: Fetch YouTube comments using the Google API.Perform sentiment analysis on each comment using TextBlob.

2. Implement Sentiment Analysis:

The sentiment analysis is performed using TextBlob. The polarity score of each comment determines whether it is positive, negative, or neutral.The backend exposes an endpoint `/sentiment/{video_id}` to fetch and analyze comments from a YouTube video.

3. Create Frontend (HTML/CSS):

Create an HTML file (index.html) to: Take YouTube Video ID as input.Display the sentiment results categorically (Positive, Neutral, Negative).Use CSS to style the categories and improve UI.Use JavaScript to fetch data from the FastAPI backend and display the results dynamically on the frontend.

4. FastAPI Server Configuration:

Serve the HTML file using FastAPI's built-in file response system.Use the Uvicorn ASGI server to run the FastAPI application: `uvicorn main:app --reload`

5. Run the Application:

Start the FastAPI server - `uvicorn main:app --reload`. Visit `http://127.0.0.1:8000/` in the browser to access the web interface.Enter a YouTube Video ID and click Analyze to view categorized comments based on sentiment.

Code:-

FLASK CODE

main.py

```
from fastapi import FastAPI
from fastapi.responses import FileResponse, JSONResponse
from googleapiclient.discovery import build
from textblob import TextBlob
from fastapi.staticfiles import StaticFiles

app = FastAPI()

# Mount static folder to serve HTML and CSS
app.mount("/static", StaticFiles(directory="static"), name="static")

API_KEY = "AIzaSyA5k8WuyYP_PUxTS9FD4vIKEGTwrTJ-onQ" # Replace with your API
key

# Function to get YouTube comments
def get_youtube_comments(video_id):
    youtube = build('youtube', 'v3', developerKey=API_KEY)
    request = youtube.commentThreads().list(
        part="snippet",
        videoId=video_id,
        textFormat="plainText",
        maxResults=50
    )
    response = request.execute()
    return [item["snippet"]["topLevelComment"]["snippet"]["textDisplay"] for
item in response.get("items", [])]

# Function to analyze sentiment
def analyze_sentiment(comment):
    blob = TextBlob(comment)
    polarity = blob.sentiment.polarity
    if polarity > 0:
        return "positive"
    elif polarity < 0:
        return "negative"
    else:
        return "neutral"

# Serve the HTML page
@app.get("/")
def serve_frontend():
    return FileResponse("static/index.html")
```

```
# API endpoint for sentiment analysis
@app.get("/sentiment/{video_id}")
def sentiment_analysis(video_id: str):
    comments = get_youtube_comments(video_id)
    results = {"positive": [], "neutral": [], "negative": []}

    for comment in comments:
        sentiment = analyze_sentiment(comment)
        results[sentiment].append(comment)

    return JSONResponse(content=results)
```

app.py

```
from googleapiclient.discovery import build

API_KEY = "AIzaSyA5k8WuyYP_PUxTS9FD4vIKEGTwrTJ-onQ"
VIDEO_ID = "rcIA7QAhpH8"

def get_youtube_comments(video_id):
    youtube = build('youtube', 'v3', developerKey=API_KEY)

    request = youtube.commentThreads().list(
        part="snippet",
        videoId=video_id,
        textFormat="plainText",
        maxResults=50 # Adjust as needed
    )

    response = request.execute()

    comments = [item["snippet"]["topLevelComment"]["snippet"]["textDisplay"]
for item in response["items"]]
    return comments

# Example usage
comments = get_youtube_comments(VIDEO_ID)
print(comments)
```

HTML CODE

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>YouTube Sentiment Analysis</title>
    <style>
```

```

    body { font-family: Arial, sans-serif; text-align: center;
background-color: #f4f4f4; }
    h1 { margin-top: 20px; }
    .container { display: flex; justify-content: space-around; margin-top:
20px; }
    .category { width: 30%; background: white; padding: 15px; border-
radius: 8px; box-shadow: 0 0 10px rgba(0, 0, 0, 0.1); }
    .positive { border-top: 5px solid green; }
    .neutral { border-top: 5px solid gray; }
    .negative { border-top: 5px solid red; }
    .comment { background: #eaeaea; padding: 10px; margin: 10px 0;
border-radius: 5px; }
</style>
</head>
<body>
  <h1>YouTube Comment Sentiment Analysis</h1>
  <input type="text" id="videoId" placeholder="Enter YouTube Video ID">
  <button onclick="fetchSentiment()">Analyze</button>

  <div class="container">
    <div class="category positive">
      <h2>Positive Comments</h2>
      <div id="positive-comments"></div>
    </div>
    <div class="category neutral">
      <h2>Neutral Comments</h2>
      <div id="neutral-comments"></div>
    </div>
    <div class="category negative">
      <h2>Negative Comments</h2>
      <div id="negative-comments"></div>
    </div>
  </div>
  <script>
    async function fetchSentiment() {
      const videoId = document.getElementById("videoId").value;
      if (!videoId) return alert("Please enter a Video ID");
      const response = await fetch(`/sentiment/${videoId}`);
      const data = await response.json();
      document.getElementById("positive-comments").innerHTML =
data.positive.map(c => `<div class="comment">${c}</div>`).join("");
      document.getElementById("neutral-comments").innerHTML =
data.neutral.map(c => `<div class="comment">${c}</div>`).join("");
      document.getElementById("negative-comments").innerHTML =
data.negative.map(c => `<div class="comment">${c}</div>`).join("");
    }
  </script>
</body>
</html>

```

3. Results/Output:- Entire Screen Shot including Date & Time

The screenshot displays the 'YouTube Comment Sentiment Analysis' web application. The browser address bar shows the URL '127.0.0.1:8000/sentiment/'. The application interface has a title bar 'YouTube Comment Sentiment Analysis' and a search input field containing 'rcIA7QAhpH8' with an 'Analyze' button. The results are categorized into three columns:

- Positive Comments:**
 - Satisfying Downfall?
 - My dad and me still regret for getting byjus worth 80,000 in 2016 .
 - He should have sold his company at the right time.
 - BYJU's down fall started the day he started publicity through Shah Rukh Khan. BYJU's closure is a good riddance.
 - A Tablet Company. Nice name 🤔
 - They came to our house but luckily we didn't took
 - Bhai tune like aur subscribe nahi kaha isiliye main tumhare channel ko like aur subscribe kr raha hon
 - Byju's couldn't trick me... they called me zillions of times for my brother... and was offering 80% scholarship... and i was right by not falling into their trick.. 😊
 - Their advertisement was over the top.
 - When i was in sixth grade, a byju's salesman also came to my home. I felt so guilty when i could not answer a single question they asked, I didn't know that they ask hard questions on purpose.
- Neutral Comments:**
 - Sarkari School ka student kon kon hai bhai?
 - chi thu.....u wont eat my money.....I am from middle classes, u cheated me
 - Peak pe sale kar deta aur aish karta
 - pw did what byjus could never
 - Today I joined aakash class 9th
 - A Byju Salesman also tricked me into buying. I paid Rs. 1.1 l for tablet and content from 4th to 12th.
 - Moral of the story- CAT me 100 percentile lane k baad MBA kr lena tha shayad cost, revenue, investment strategies ka thoda idea ho jata. Ine jaldi itna paisa uthane k karan company barbaad
 - They fooled employees giving them hope to pay 60k per month
 - Yea they try to manipulate my parents, my mother almost took it but at the end , we didn't, they irritated us a lot with calls tho
 - i was also in that stadium when i was in 6th or 7th class .
- Negative Comments:**
 - Its not byjus fall its India's fall in digital education It all happened because of dirty politicians having nos of school, college and universities 🤔 Please save India 🤔
 - Why did the company go down 10:00
 - The video has become average merely because of the background music
 - okay so here's my story of byjus the salesman tricked my parents for 35k package during the time of lockdown and it wasn't possible to actually meet the person face to face but somehow they managed and came to our home for the FAQs session. After which i felt totally demotivated because I couldn't answer single question answered by them. Well it does shocked me because i was topper since my childhood days i couldn't get recognised for this downfall. So my parents bought me byjus ngl everything was interactive but slowly and gradually the person who was asked to clear my doubts went irritating and i lost interest. I really regret that I didn't studied even after all of this. My dad never believed spending on me from that time
 - Yes 1 baar mere ghar bhi aye the aur bahut tough questions pooch rhe the phir unhone mere father se kaha ki aap apne bete ka admission isi me karwa dijiye hum use tablet ...etc denge lekin maine mummy se kah kar papa ko mna karwa diya
 - My uncle kid studied form byjus in 10th class and he failed in 10th

The Windows taskbar at the bottom shows the date and time as 22:50 on 31-03-2025.

The video taken as input:

The screenshot shows the YouTube video player for the video 'The Satisfying Downfall of Byju's' by Shivanshu Agrawal. The video title is 'The Satisfying Downfall of Byju's' and the channel name is 'Shivanshu Agrawal' with 1.41M subscribers. The video has 7M views and was uploaded 11 months ago. The video player shows the video progress at 0:03 / 17:09. The video content shows the year 2013 and the text 'Year 2013.' The right sidebar shows recommended videos, including 'All set up ZERO TOUCH', 'The Painful Downfall of Big Bazaar', 'How A Poor Boy Built Oberoi Hotels', and 'How FIIT-JEE F***** Up'. The Windows taskbar at the bottom shows the date and time as 23:12 on 31-03-2025.

4. Remarks:-

In this experiment, we successfully developed a web application using FastAPI that fetches comments from YouTube videos, performs sentiment analysis on each comment using TextBlob, and categorizes the comments into Positive, Neutral, and Negative groups. The application integrates a Python backend to handle data processing and a user-friendly frontend to display the results in a visually appealing manner. By utilizing Google API for YouTube data and combining it with NLP techniques for sentiment analysis, this experiment demonstrated the effective use of modern web technologies for real-time data processing and sentiment evaluation. This approach can be expanded for more complex sentiment analysis applications and real-world use cases.

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