Ganpat University | Institute of Computer Technology

॥ विद्यया समाजोत्कर्षः ॥

Name: Tushar Panchal

En.No: 21162101014

Sub: EADC (Enterprise Application Development for Cloud)

Branch: CBA

Batch:61

---------------------------PRACTICAL 14----------------------------

❖ AIM :

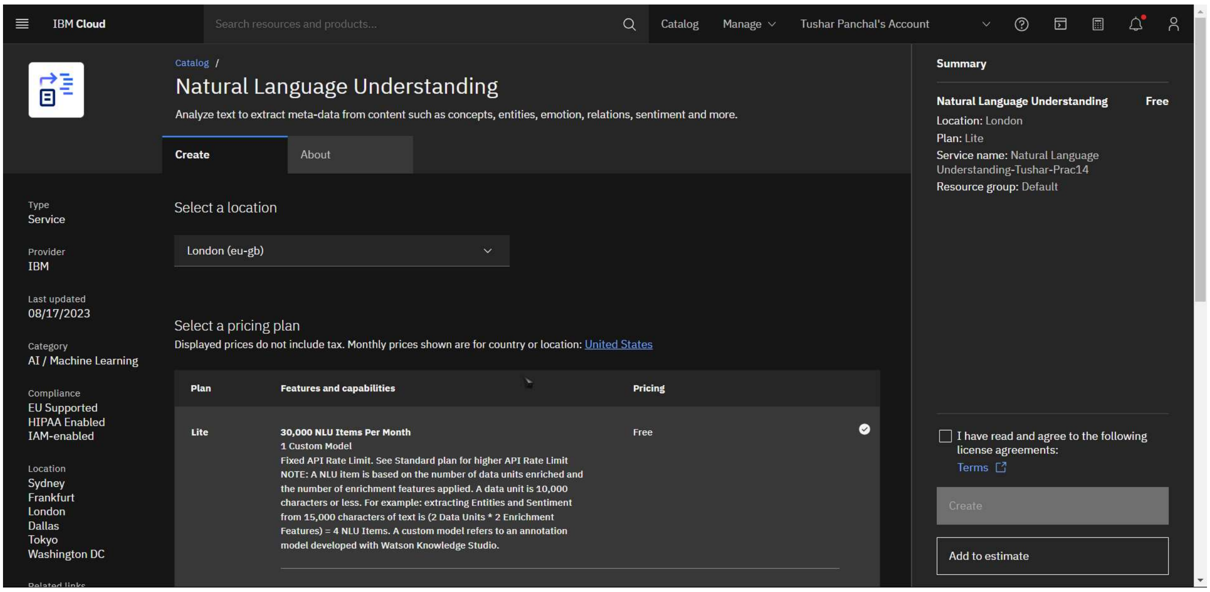
Using IBM Cloud, develop an application to implement a Nodejs Application and enrich your Application with Cloud Services.

1. Create an Application to handle data from 3rd party API(here IMDB API).
2. Integrate NLU into your application to perform sentiment analysis on the feed captured from IMDB.
3. Integrate database service to store captured feeds and their results.

Creating Natural Language Understanding (NLU) Service :

Login to IBM cloud and First navigate watsonx assistant service Select trial and create service.

Search for NLU on IBM cloud Catalog and hit create service :



Natural Language Understanding

Analyze text to extract meta-data from content such as concepts, entities, emotion, relations, sentiment and more.

Type
Service

Provider
IBM

Last updated
08/17/2023

Category
AI / Machine Learning

Compliance
EU Supported
HIPAA Enabled
IAM-enabled

Location
Sydney
Frankfurt
London
Dallas
Tokyo
Washington DC

Related links

Select a location

London (eu-gb)

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or location: United States

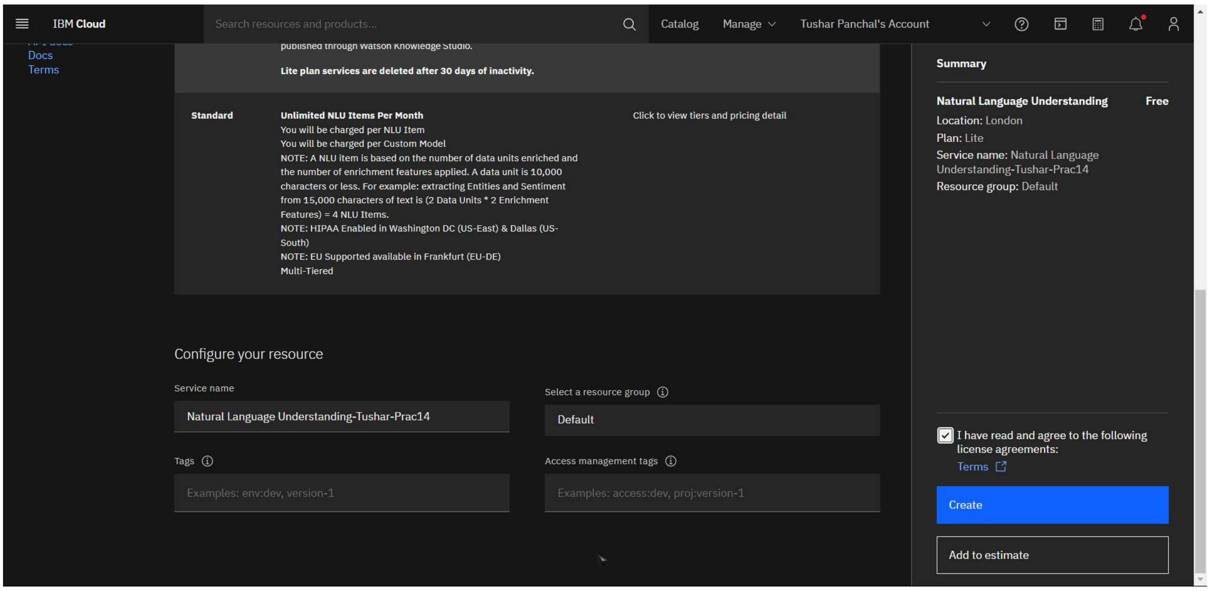
Plan	Features and capabilities	Pricing
Lite	**30,000 NLU Items Per Month** 1 Custom Model Fixed API Rate Limit. See Standard plan for higher API Rate Limit NOTE: A NLU item is based on the number of data units enriched and the number of enrichment features applied. A data unit is 10,000 characters or less. For example: extracting Entities and Sentiment from 15,000 characters of text is (2 Data Units * 2 Enrichment Features) = 4 NLU Items. A custom model refers to an annotation model developed with Watson Knowledge Studio.	Free

Summary

Natural Language Understanding Free
Location: London
Plan: Lite
Service name: Natural Language Understanding-Tushar-Prac14
Resource group: Default

☐ I have read and agree to the following license agreements:
Terms

Name it and hit create button:



published through Watson Knowledge Studio.

Lite plan services are deleted after 30 days of inactivity.

Plan	Features and capabilities	Pricing
Standard	**Unlimited NLU Items Per Month** You will be charged per NLU Item You will be charged per Custom Model NOTE: A NLU item is based on the number of data units enriched and the number of enrichment features applied. A data unit is 10,000 characters or less. For example: extracting Entities and Sentiment from 15,000 characters of text is (2 Data Units * 2 Enrichment Features) = 4 NLU Items. NOTE: HIPAA Enabled in Washington DC (US-East) & Dallas (US-South) NOTE: EU Supported available in Frankfurt (EU-DE) Multi-Tiered	Click to view tiers and pricing detail

Configure your resource

Service name: Natural Language Understanding-Tushar-Prac14

Select a resource group: Default

Tags: Examples: env:dev, version-1

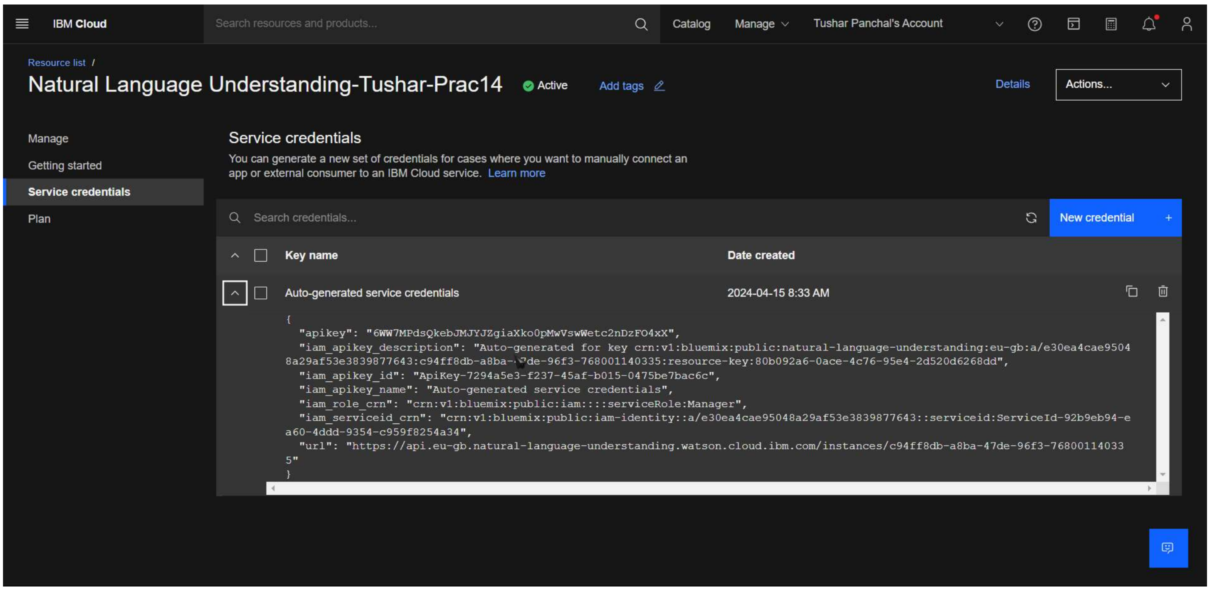
Access management tags: Examples: access:dev, proj:version-1

Summary

Natural Language Understanding Free
Location: London
Plan: Lite
Service name: Natural Language Understanding-Tushar-Prac14
Resource group: Default

☑ I have read and agree to the following license agreements:
Terms

After that you will see that our service has been created :



Natural Language Understanding-Tushar-Prac14 Active Add tags

Service credentials

You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service. Learn more

	Key name	Date created
□	Auto-generated service credentials	2024-04-15 8:33 AM

```
{
  "apikey": "6WW7MPdsQkebJMJYJZgiaXko0pMwVswWetc2nDzFO4xX",
  "iam_apikey_description": "Auto-generated for key crn:v1:bluemix:public:natural-language-understanding:eu-gb:a/e30ea4cae9504
8a29af53e3839877643:c94ff8db-a8ba-47de-96f3-768001140335:resource-key:80b092a6-0ace-4c76-95e4-2d520d6268dd",
  "iam_apikey_id": "ApiKey-7294a5e3-f237-45af-b015-0475be7bac6c",
  "iam_apikey_name": "Auto-generated service credentials",
  "iam_role_crn": "crn:v1:bluemix:public:iam::::serviceRole:Manager",
  "iam_serviceid_crn": "crn:v1:bluemix:public:iam-identity::a/e30ea4cae95048a29af53e3839877643::serviceid:ServiceId-92b9eb94-e
a60-4ddd-9354-c959f8254a34",
  "url": "https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/c94ff8db-a8ba-47de-96f3-76800114033
5"
}
```

Step 1 : Analyse a Webpage :

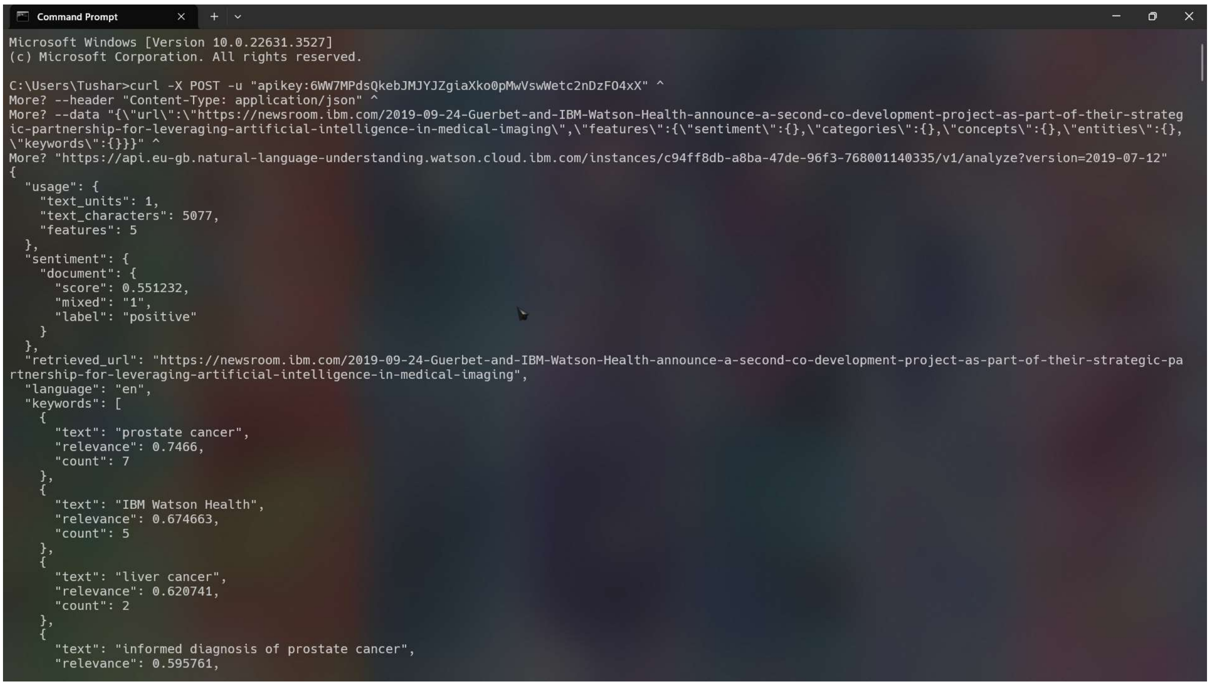
Now Run the following command to analyze a webpage to get sentiment, concepts, categories, entities, and keywords.

```
curl -X POST -u "apikey:6WW7MPdsQkebJMJYJZgiaXko0pMwVswWetc2nDzFO4xX" ^

--header "Content-Type: application/json" ^

--data "{\"url\":\"https://newsroom.ibm.com/2019-09-24-Guerbet-and-IBM-Watson-Health-announce-a-second-co-development-project-as-part-of-their-strategic-partnership-for-leveraging-artificial-intelligence-in-medical-imaging\",\"features\":{\"sentiment\":{},\"categories\":{},\"concepts\":{},\"entities\":{},\"keywords\":{}}}" ^

"https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/c94ff8db-a8ba-47de-96f3-768001140335/v1/analyze?version=2019-07-12"
```

or

```
curl -X POST -u "apikey:6WW7MPdsQkebJMJYJZgiaXko0pMwVswWetc2nDzFO4xX" --header "Content-Type: application/json" --data "{\"url\":\"https://newsroom.ibm.com/2019-09-24-Guerbet-and-IBM-Watson-Health-announce-a-second-co-development-project-as-part-of-their-strategic-partnership-for-leveraging-artificial-intelligence-in-medical-imaging\",\"features\":{\"sentiment\":{},\"categories\":{},\"concepts\":{},\"entities\":{},\"keywords\":{}}}" "https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/c94ff8db-a8ba-47de-96f3-768001140335/v1/analyze?version=2019-07-12"
```

✓ **Output:**



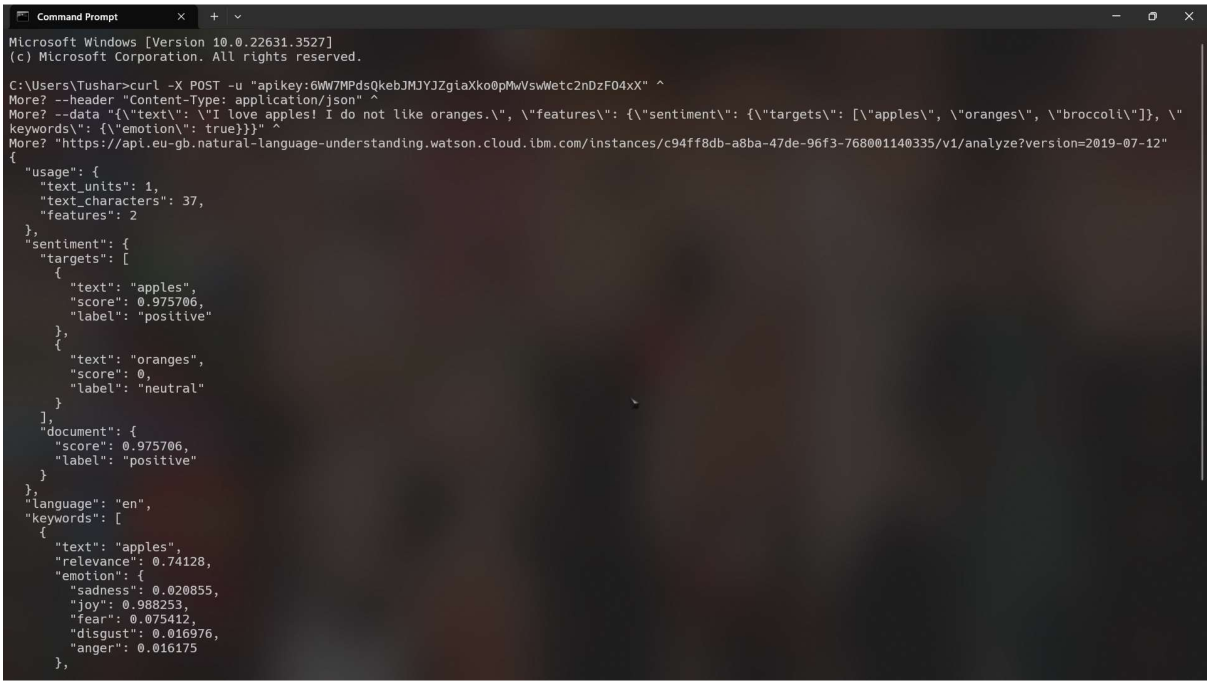
```
Microsoft Windows [Version 10.0.22631.3527]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Tushar>curl -X POST -u "apikey:6WW7MPdsQkebJMJYJZgiaXko0pMwVswWetc2nDzFO4xX" ^
More? --header "Content-Type: application/json" ^
More? --data "{\"url\":\"https://newsroom.ibm.com/2019-09-24-Guerbet-and-IBM-Watson-Health-announce-a-second-co-development-project-as-part-of-their-strateg
ic-partnership-for-leveraging-artificial-intelligence-in-medical-imaging\",\"features\":{\"sentiment\":{},\"categories\":{},\"concepts\":{},\"entities\":{},
\"keywords\":{}}}" ^
More? "https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/c94ff8db-a8ba-47de-96f3-768001140335/v1/analyze?version=2019-07-12"
{
  "usage": {
    "text_units": 1,
    "text_characters": 5077,
    "features": 5
  },
  "sentiment": {
    "document": {
      "score": 0.551232,
      "mixed": "1",
      "label": "positive"
    }
  },
  "retrieved_url": "https://newsroom.ibm.com/2019-09-24-Guerbet-and-IBM-Watson-Health-announce-a-second-co-development-project-as-part-of-their-strategic-pa
rtnership-for-leveraging-artificial-intelligence-in-medical-imaging",
  "language": "en",
  "keywords": [
    {
      "text": "prostate cancer",
      "relevance": 0.7466,
      "count": 7
    },
    {
      "text": "IBM Watson Health",
      "relevance": 0.674663,
      "count": 5
    },
    {
      "text": "liver cancer",
      "relevance": 0.620741,
      "count": 2
    },
    {
      "text": "informed diagnosis of prostate cancer",
      "relevance": 0.595761,
```

» **Step 2 : Analyze target phrases and keywords :**

The **targets** option for sentiment in the following example tells the service to search for the targets "apples", "oranges", and "broccoli". Since "apples" and "oranges" are located in the text, sentiment scores are returned for those targets.

```
curl -X POST -u "apikey:{apikey}" ^
--header "Content-Type: application/json" ^
--data "{\"text\": \"I love apples! I do not like oranges.\", \"features\":
{\"sentiment\": {\"targets\": [\"apples\", \"oranges\", \"broccoli\"]},
\"keywords\": {\"emotion\": true}}}" ^
"{url}/v1/analyze?version=2019-07-12"
```

✓ **Output:**



```
Microsoft Windows [Version 10.0.22631.3527]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Tushar>curl -X POST -u "apikey:6WW7MPdsQkebJMJYJZgiaXko0pMwVswWetc2nDzFO4xX" ^
More? --header "Content-Type: application/json" ^
More? --data "{\"text\": \"I love apples! I do not like oranges.\", \"features\": {\"sentiment\": {\"targets\": [\"apples\", \"oranges\", \"broccoli\"]}, \"
keywords\": {\"emotion\": true}}}" ^
More? "https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/c94ff8db-a8ba-47de-96f3-768001140335/v1/analyze?version=2019-07-12"
{
  "usage": {
    "text_units": 1,
    "text_characters": 37,
    "features": 2
  },
  "sentiment": {
    "targets": [
      {
        "text": "apples",
        "score": 0.975706,
        "label": "positive"
      },
      {
        "text": "oranges",
        "score": 0,
        "label": "neutral"
      }
    ],
    "document": {
      "score": 0.975706,
      "label": "positive"
    }
  },
  "language": "en",
  "keywords": [
    {
      "text": "apples",
      "relevance": 0.74128,
      "emotion": {
        "sadness": 0.020855,
        "joy": 0.988253,
        "fear": 0.075412,
        "disgust": 0.016976,
        "anger": 0.016175
      },
```

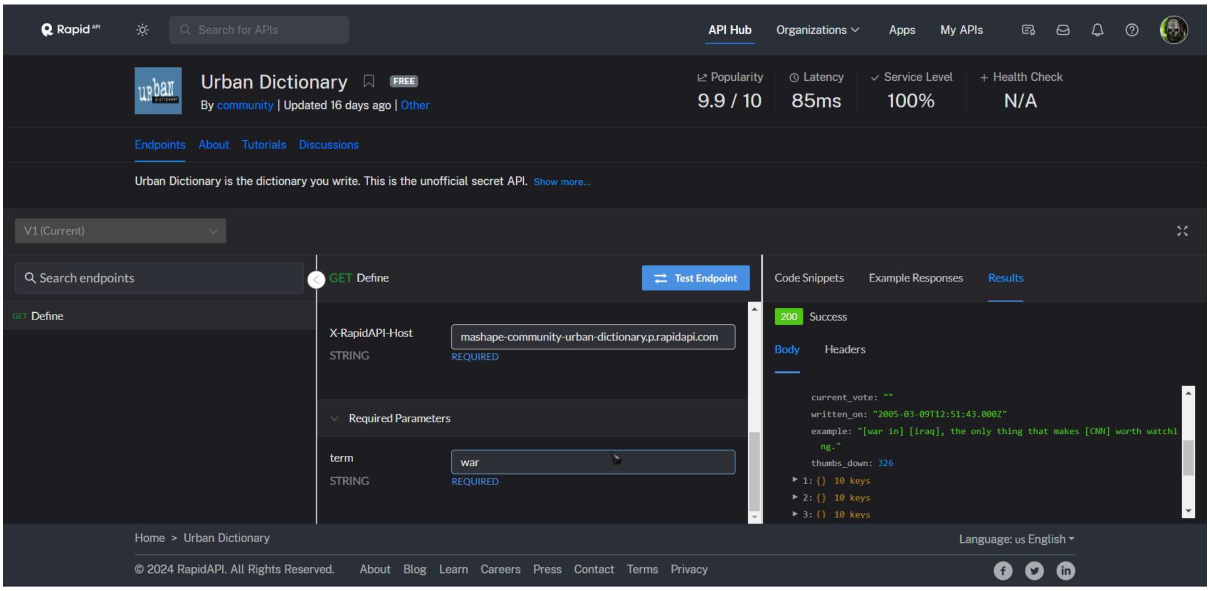
» Question 1 : Create a Chatbot application intent and dialog regarding specified field.

➢ To begin, create an account on RapidAPI and navigate to the search section to find the Urban Dictionary API.

➢ In the API details, you will find the Request URL, X-RapidAPI-Key, and X-RapidAPI-Host pre-filled.

➢ Enter the term "war" or any other word of your choice into the required parameters field. Click on the "Test Endpoint" button to retrieve information related to the term "war" from the Urban Dictionary API.

➢ The results will display information about the term "war" as per the Urban Dictionary API response.



Urban Dictionary
By community | Updated 16 days ago | Other

Popularity 9.9 / 10 · Latency 85ms · Service Level 100% · Health Check N/A

Urban Dictionary is the dictionary you write. This is the unofficial secret API. Show more...

GET Define

X-RapidAPI-Host STRING: mashape-community-urban-dictionary.p.rapidapi.com REQUIRED

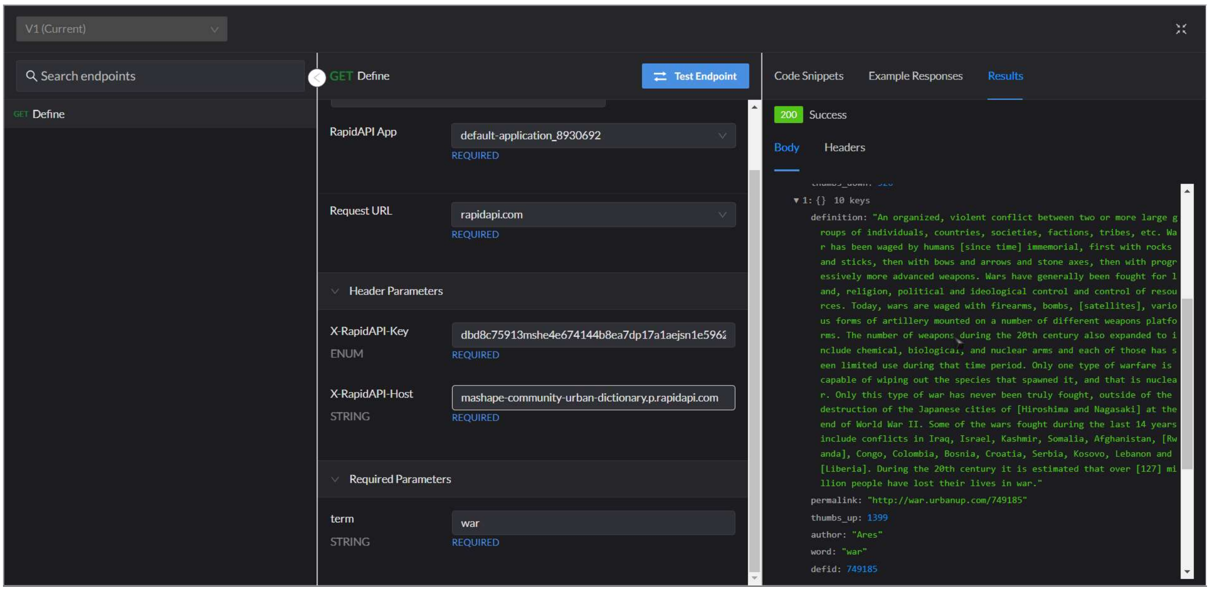
Required Parameters

term STRING: war REQUIRED

200 Success

```
    current_vote: ""
    written_on: "2005-03-09T12:51:43.000Z"
    example: "[war in] [iraq], the only thing that makes [CNN] worth watchi
      ng."
    thumbs_down: 326
  ▸ 1: {} 10 keys
  ▸ 2: {} 10 keys
  ▸ 3: {} 10 keys
```

➢After receiving the response body, select the first item in the list to view the definition sentences.



GET Define

RapidAPI App: default-application_8930692 REQUIRED

Request URL: rapidapi.com REQUIRED

Header Parameters

X-RapidAPI-Key ENUM: dbd8c75913mshe4e674144b8ea7dp17a1aejsn1e596 REQUIRED

X-RapidAPI-Host STRING: mashape-community-urban-dictionary.p.rapidapi.com REQUIRED

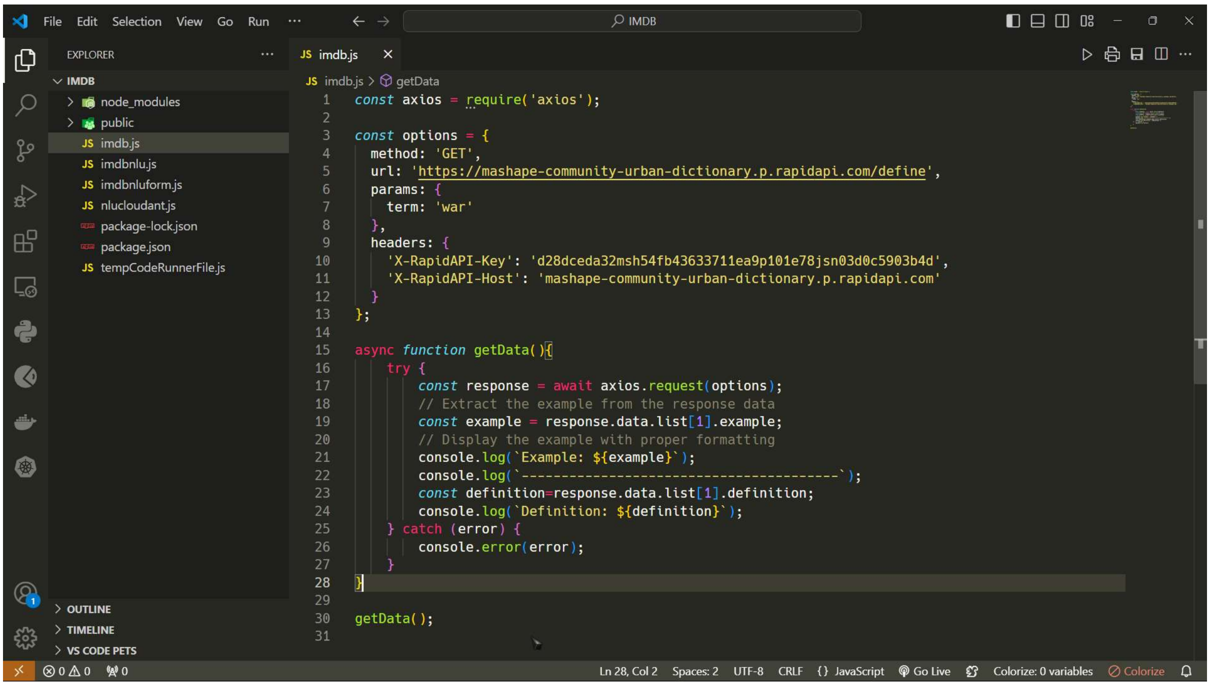
Required Parameters

term STRING: war REQUIRED

200 Success

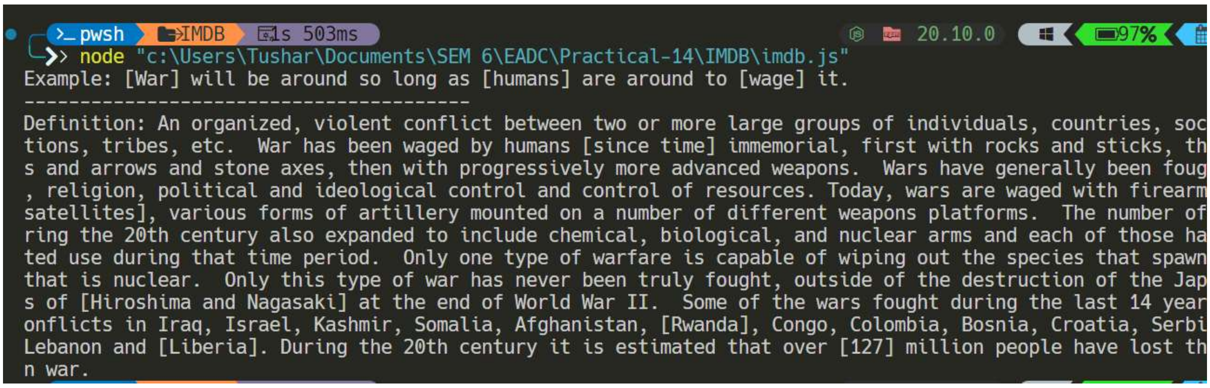
```
  ▾ 1: {} 10 keys
    definition: "An organized, violent conflict between two or more large g
      roups of individuals, countries, societies, factions, tribes, etc. Wa
      r has been waged by humans [since time] immemorial, first with rocks
      and sticks, then with bows and arrows and stone axes, then with progr
      essively more advanced weapons. Wars have generally been fought for l
      and, religion, political and ideological control and control of resou
      rces. Today, wars are waged with firearms, bombs, [satellites], vario
      us forms of artillery mounted on a number of different weapons platfo
      rms. The number of weapons during the 20th century also expanded to i
      nclude chemical, biological, and nuclear arms and each of those has s
      een limited use during that time period. Only one type of warfare is
      capable of wiping out the species that spawned it, and that is nuclea
      r. Only this type of war has never been truly fought, outside of the
      destruction of the Japanese cities of [Hiroshima and Nagasaki] at the
      end of World War II. Some of the wars fought during the last 14 years
      include conflicts in Iraq, Israel, Kashmir, Somalia, Afghanistan, [Rw
      anda], Congo, Colombia, Bosnia, Croatia, Serbia, Kosovo, Lebanon and
      [Liberia]. During the 20th century it is estimated that over [127] mi
      llion people have lost their lives in war."
    permalink: "http://war.urbanup.com/749185"
    thumbs_up: 1399
    author: "Ares"
    word: "war"
    defid: 749185
```

➢ We can retrieve this list's definition directly in our terminal using the provided code.



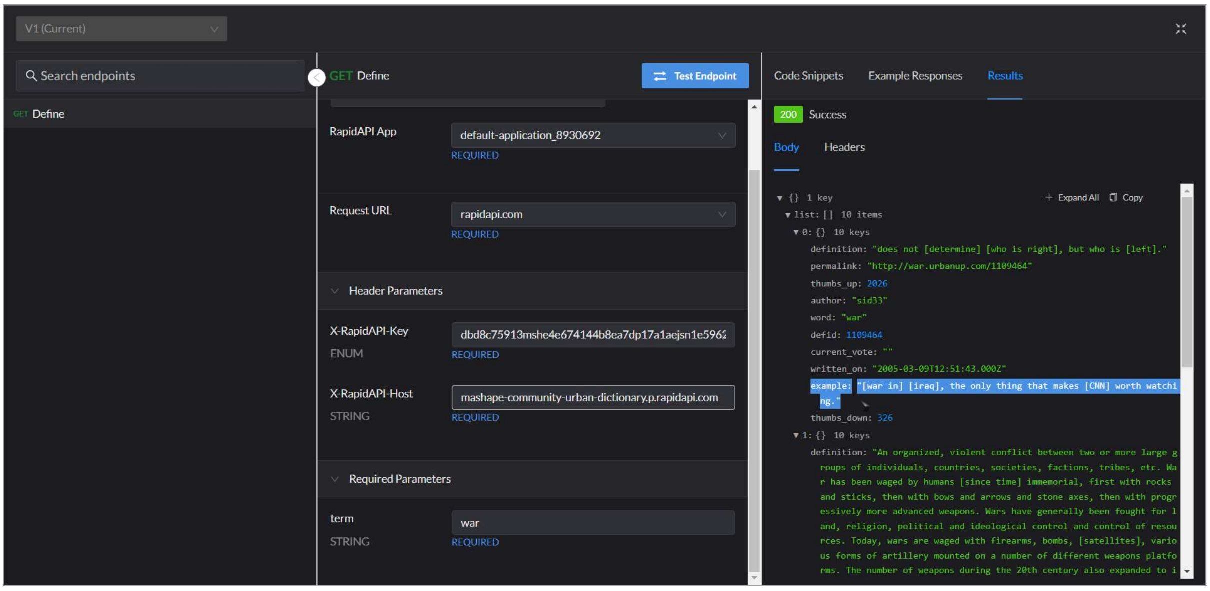
```javascript
const axios = require('axios');

const options = {
  method: 'GET',
  url: 'https://mashape-community-urban-dictionary.p.rapidapi.com/define',
  params: {
    term: 'war'
  },
  headers: {
    'X-RapidAPI-Key': 'd28dceda32msh54fb43633711ea9p101e78jsn03d0c5903b4d',
    'X-RapidAPI-Host': 'mashape-community-urban-dictionary.p.rapidapi.com'
  }
};

async function getData(){
    try {
        const response = await axios.request(options);
        // Extract the example from the response data
        const example = response.data.list[1].example;
        // Display the example with proper formatting
        console.log(`Example: ${example}`);
        console.log(`----------------------------------------`);
        const definition=response.data.list[1].definition;
        console.log(`Definition: ${definition}`);
    } catch (error) {
        console.error(error);
    }
}

getData();
```

- ✓ **<u>Output:</u>**



```
>> node "c:\Users\Tushar\Documents\SEM 6\EADC\Practical-14\IMDB\imdb.js"
Example: [War] will be around so long as [humans] are around to [wage] it.
----------------------------------------
Definition: An organized, violent conflict between two or more large groups of individuals, countries, soc
tions, tribes, etc.  War has been waged by humans [since time] immemorial, first with rocks and sticks, th
s and arrows and stone axes, then with progressively more advanced weapons.  Wars have generally been foug
, religion, political and ideological control and control of resources. Today, wars are waged with firearm
satellites], various forms of artillery mounted on a number of different weapons platforms.  The number of
ring the 20th century also expanded to include chemical, biological, and nuclear arms and each of those ha
ted use during that time period.  Only one type of warfare is capable of wiping out the species that spawn
that is nuclear.  Only this type of war has never been truly fought, outside of the destruction of the Jap
s of [Hiroshima and Nagasaki] at the end of World War II.  Some of the wars fought during the last 14 year
onflicts in Iraq, Israel, Kashmir, Somalia, Afghanistan, [Rwanda], Congo, Colombia, Bosnia, Croatia, Serbi
Lebanon and [Liberia]. During the 20th century it is estimated that over [127] million people have lost th
n war.
```

➢ In code, if we add response.data.list[1].example then we can see example filed data



RapidAPI App: default-application_8930692 REQUIRED

Request URL: rapidapi.com REQUIRED

X-RapidAPI-Key ENUM: dbd8c75913mshe4e674144b8ea7dp17a1aejsn1e596‹ REQUIRED

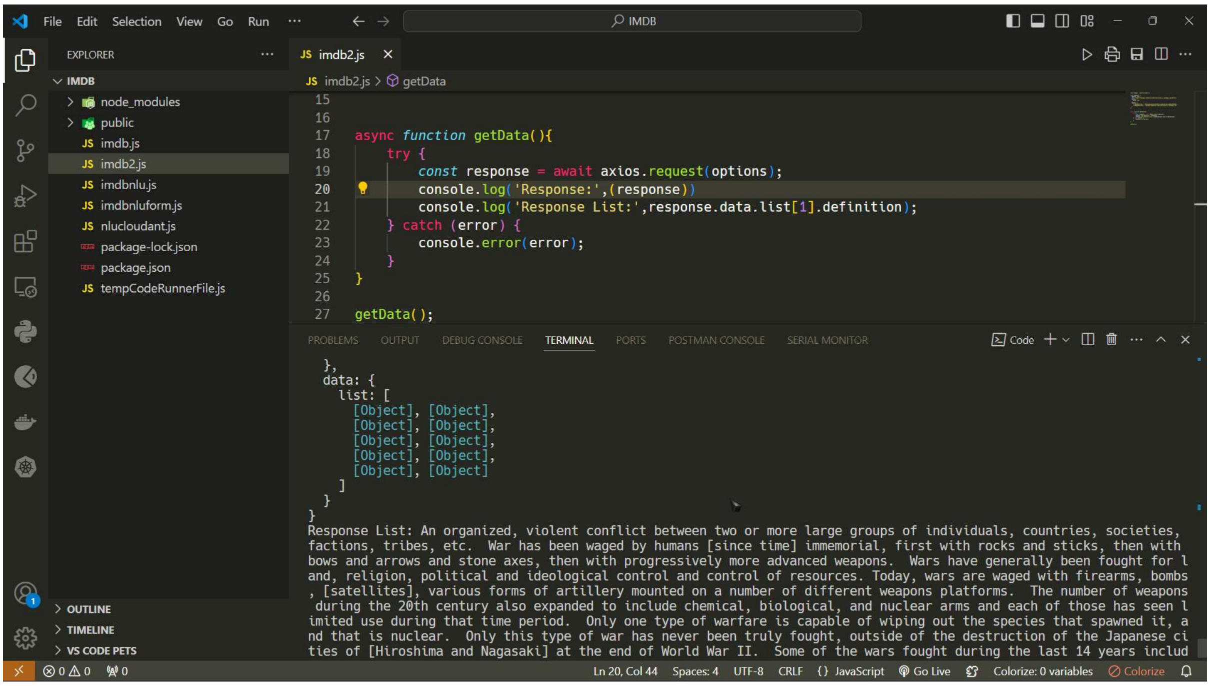
X-RapidAPI-Host STRING: mashape-community-urban-dictionary.p.rapidapi.com REQUIRED

term STRING: war REQUIRED

200 Success

```
▼ {} 1 key
  ▼ list: [] 10 items
    ▼ 0: {} 10 keys
        definition: "does not [determine] [who is right], but who is [left]."
        permalink: "http://war.urbanup.com/1109464"
        thumbs_up: 2026
        author: "sid33"
        word: "war"
        defid: 1109464
        current_vote: ""
        written_on: "2005-03-09T12:51:43.000Z"
        example: "[war in] [iraq], the only thing that makes [CNN] worth watchi
          ng."
        thumbs_down: 326
    ▼ 1: {} 10 keys
        definition: "An organized, violent conflict between two or more large g
          roups of individuals, countries, societies, factions, tribes, etc. Wa
          r has been waged by humans [since time] immemorial, first with rocks
          and sticks, then with bows and arrows and stone axes, then with progr
          essively more advanced weapons. Wars have generally been fought for l
          and, religion, political and ideological control and control of resou
          rces. Today, wars are waged with firearms, bombs, [satellites], vario
          us forms of artillery mounted on a number of different weapons platfo
          rms. The number of weapons during the 20th century also expanded to i
```

✓ **Output:**

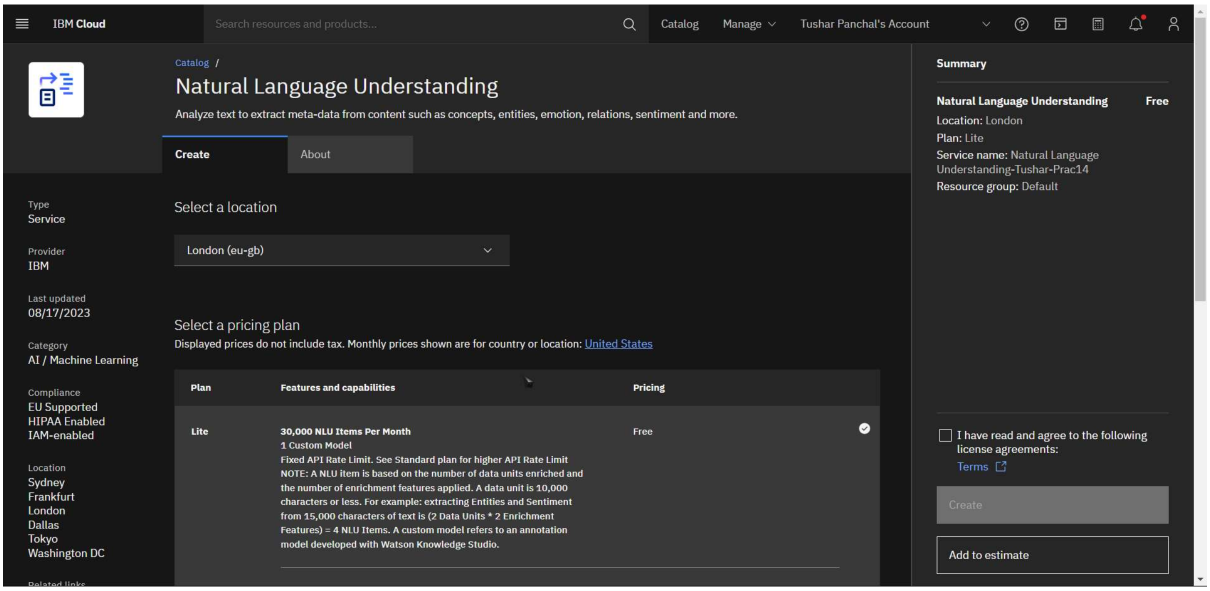


```javascript


async function getData(){
    try {
        const response = await axios.request(options);
        console.log('Response:',(response))
        console.log('Response List:',response.data.list[1].definition);
    } catch (error) {
        console.error(error);
    }
}

getData();
```

```
  },
  data: {
    list: [
      [Object], [Object],
      [Object], [Object],
      [Object], [Object],
      [Object], [Object],
      [Object], [Object]
    ]
  }
}
Response List: An organized, violent conflict between two or more large groups of individuals, countries, societies,
factions, tribes, etc.  War has been waged by humans [since time] immemorial, first with rocks and sticks, then with
bows and arrows and stone axes, then with progressively more advanced weapons.  Wars have generally been fought for l
and, religion, political and ideological control and control of resources. Today, wars are waged with firearms, bombs
, [satellites], various forms of artillery mounted on a number of different weapons platforms.  The number of weapons
 during the 20th century also expanded to include chemical, biological, and nuclear arms and each of those has seen l
imited use during that time period.  Only one type of warfare is capable of wiping out the species that spawned it, a
nd that is nuclear.  Only this type of war has never been truly fought, outside of the destruction of the Japanese ci
ties of [Hiroshima and Nagasaki] at the end of World War II.  Some of the wars fought during the last 14 years includ
```

» Question 2 : Integrate NLU into your application to perform sentiment analysis on the feed captured from IMDB.

➢ To incorporate the Watson Natural Language Understanding service into our application, we must first create the service in the IBM Cloud platform.



IBM Cloud

Catalog /

Natural Language Understanding

Analyze text to extract meta-data from content such as concepts, entities, emotion, relations, sentiment and more.

Create | About

Type: Service

Provider: IBM

Last updated: 08/17/2023

Category: AI / Machine Learning

Compliance: EU Supported, HIPAA Enabled, IAM-enabled

Location: Sydney, Frankfurt, London, Dallas, Tokyo, Washington DC

Select a location: London (eu-gb)

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or location: United States

Plan	Features and capabilities	Pricing
Lite	**30,000 NLU Items Per Month** 1 Custom Model Fixed API Rate Limit. See Standard plan for higher API Rate Limit NOTE: A NLU item is based on the number of data units enriched and the number of enrichment features applied. A data unit is 10,000 characters or less. For example: extracting Entities and Sentiment from 15,000 characters of text is (2 Data Units * 2 Enrichment Features) = 4 NLU Items. A custom model refers to an annotation model developed with Watson Knowledge Studio.	Free

Summary

Natural Language Understanding — Free

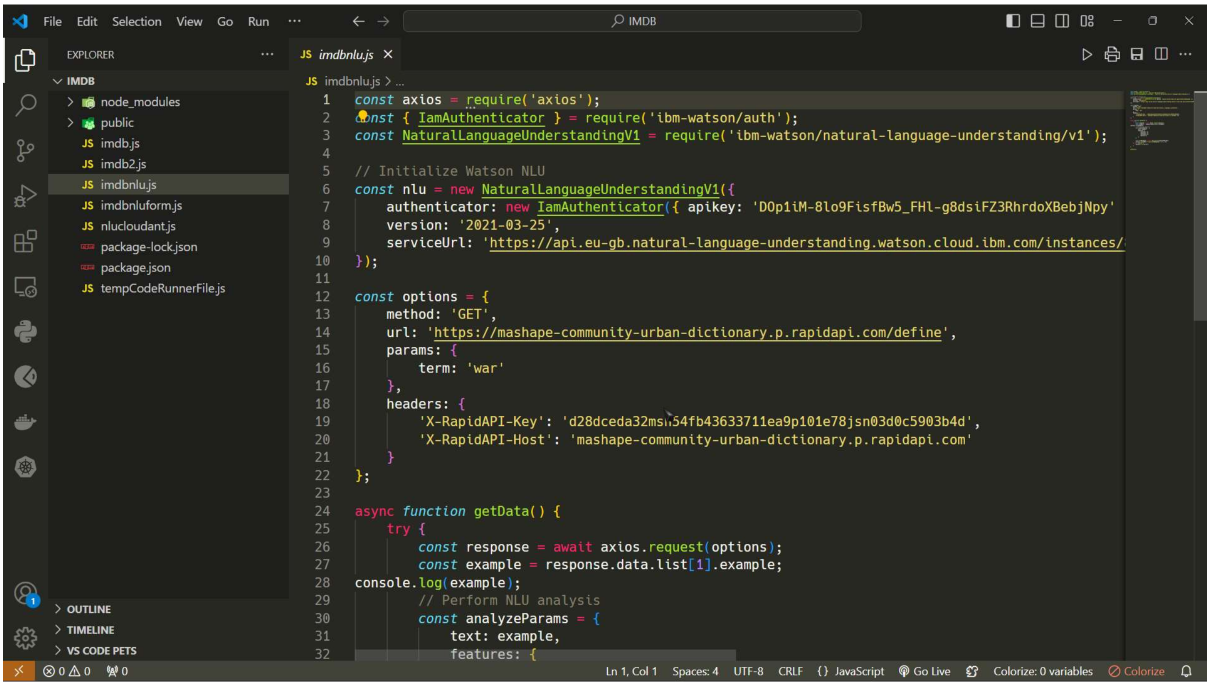
Location: London

Plan: Lite

Service name: Natural Language Understanding-Tushar-Prac14

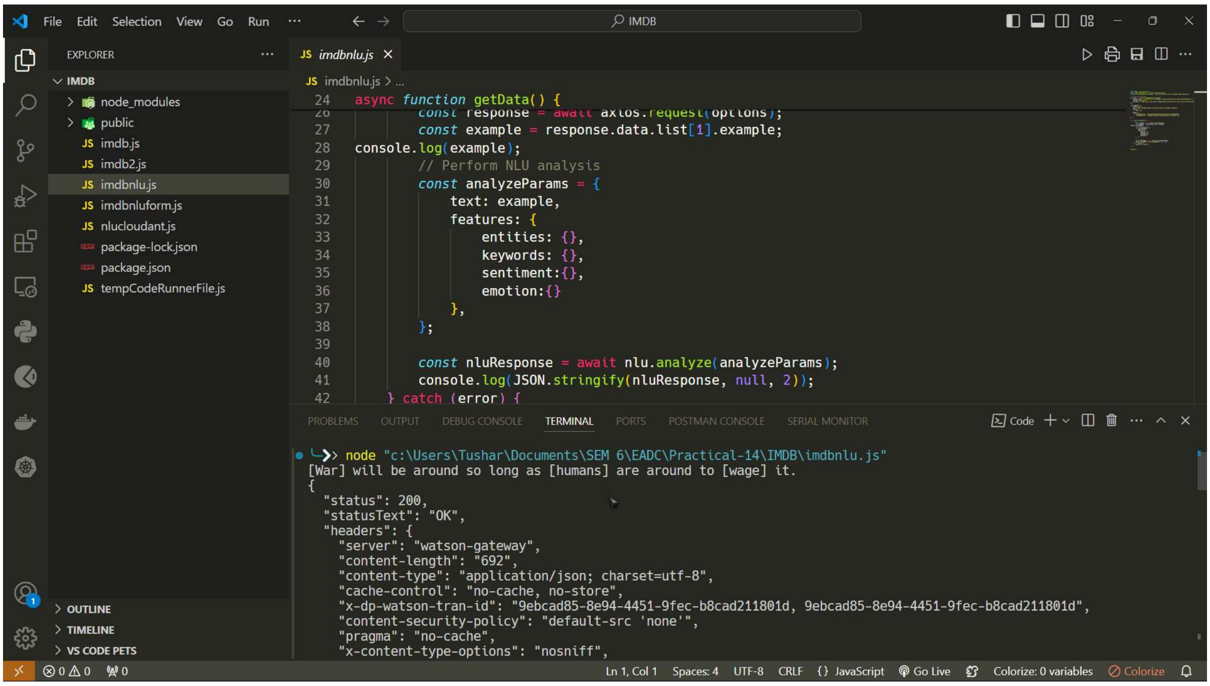
Resource group: Default

□ I have read and agree to the following license agreements: Terms



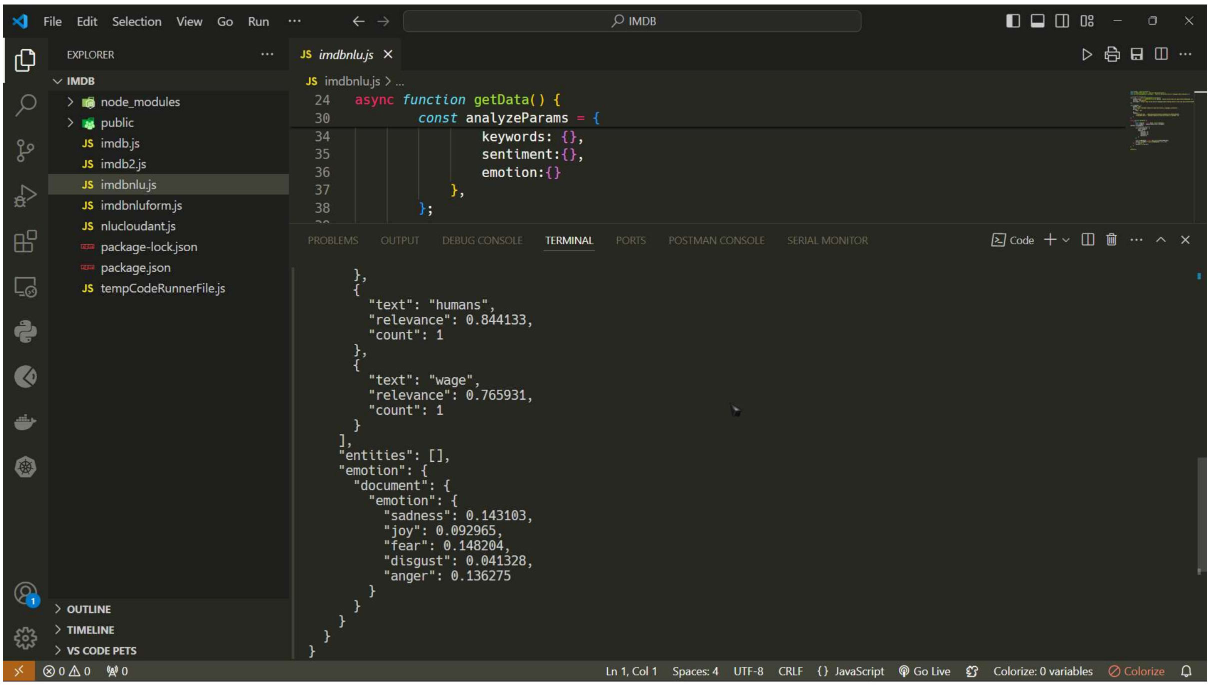
```
const axios = require('axios');
const { IamAuthenticator } = require('ibm-watson/auth');
const NaturalLanguageUnderstandingV1 = require('ibm-watson/natural-language-understanding/v1');

// Initialize Watson NLU
const nlu = new NaturalLanguageUnderstandingV1({
    authenticator: new IamAuthenticator({ apikey: 'DOp1iM-8lo9FisfBw5_FHl-g8dsiFZ3RhrdoXBebjNpy'
    version: '2021-03-25',
    serviceUrl: 'https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/
});

const options = {
    method: 'GET',
    url: 'https://mashape-community-urban-dictionary.p.rapidapi.com/define',
    params: {
        term: 'war'
    },
    headers: {
        'X-RapidAPI-Key': 'd28dceda32msh54fb43633711ea9p101e78jsn03d0c5903b4d',
        'X-RapidAPI-Host': 'mashape-community-urban-dictionary.p.rapidapi.com'
    }
};

async function getData() {
    try {
        const response = await axios.request(options);
        const example = response.data.list[1].example;
console.log(example);
        // Perform NLU analysis
        const analyzeParams = {
            text: example,
            features: {
```

➢ By implementing the code provided, we can extract the sentiments, emotional analysis of a definition from the NLU response, including emotions like sadness, joy, fear, disgust, and anger.


File Edit Selection View Go Run
IMDB
EXPLORER
IMDB
node_modules
public
imdb.js
imdb2.js
imdbnlu.js
imdbnluform.js
nlucloudant.js
package-lock.json
package.json
tempCodeRunnerFile.js
OUTLINE
TIMELINE
VS CODE PETS
imdbnlu.js
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SERIAL MONITOR
Code
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF {} JavaScript Go Live Colorize: 0 variables Colorize

```
async function getData() {
        const response = await axios.request(options);
        const example = response.data.list[1].example;
console.log(example);
        // Perform NLU analysis
        const analyzeParams = {
            text: example,
            features: {
                entities: {},
                keywords: {},
                sentiment:{},
                emotion:{}
            },
        };

        const nluResponse = await nlu.analyze(analyzeParams);
        console.log(JSON.stringify(nluResponse, null, 2));
    } catch (error) {
```

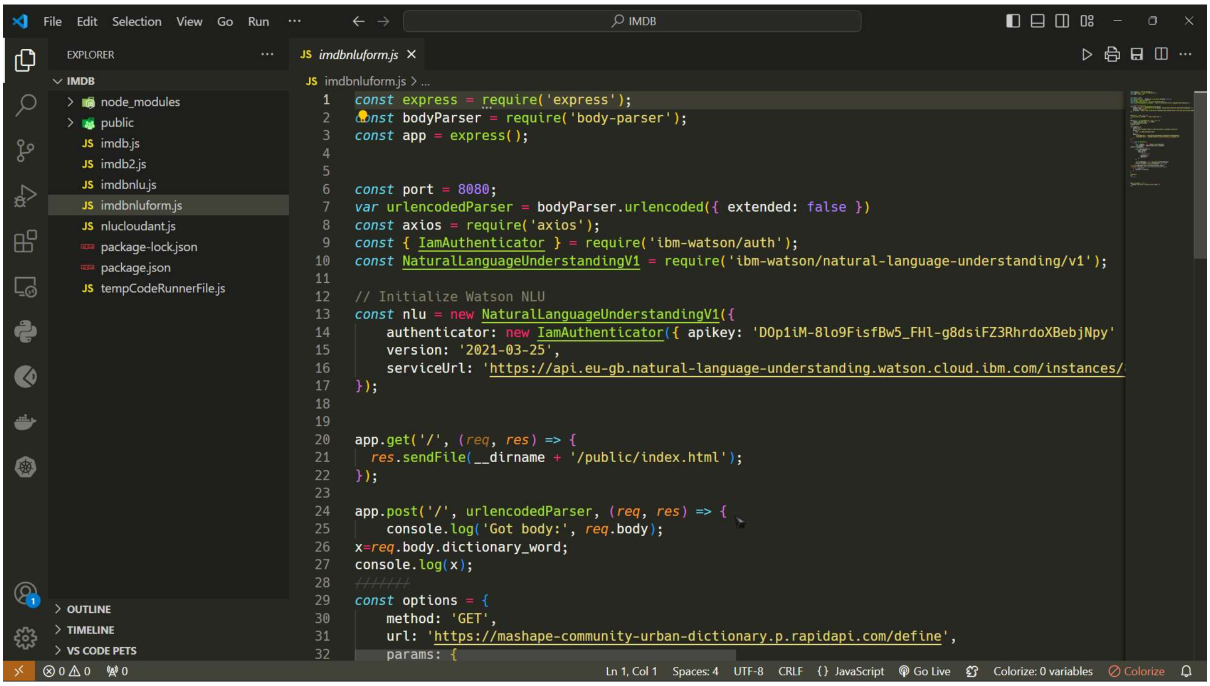
```
└> node "c:\Users\Tushar\Documents\SEM 6\EADC\Practical-14\IMDB\imdbnlu.js"
[War] will be around so long as [humans] are around to [wage] it.
{
  "status": 200,
  "statusText": "OK",
  "headers": {
    "server": "watson-gateway",
    "content-length": "692",
    "content-type": "application/json; charset=utf-8",
    "cache-control": "no-cache, no-store",
    "x-dp-watson-tran-id": "9ebcad85-8e94-4451-9fec-b8cad211801d, 9ebcad85-8e94-4451-9fec-b8cad211801d",
    "content-security-policy": "default-src 'none'",
    "pragma": "no-cache",
    "x-content-type-options": "nosniff",
```


File Edit Selection View Go Run
IMDB
EXPLORER
IMDB
node_modules
public
imdb.js
imdb2.js
imdbnlu.js
imdbnluform.js
nlucloudant.js
package-lock.json
package.json
tempCodeRunnerFile.js
OUTLINE
TIMELINE
VS CODE PETS
imdbnlu.js
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SERIAL MONITOR
Code
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF {} JavaScript Go Live Colorize: 0 variables Colorize

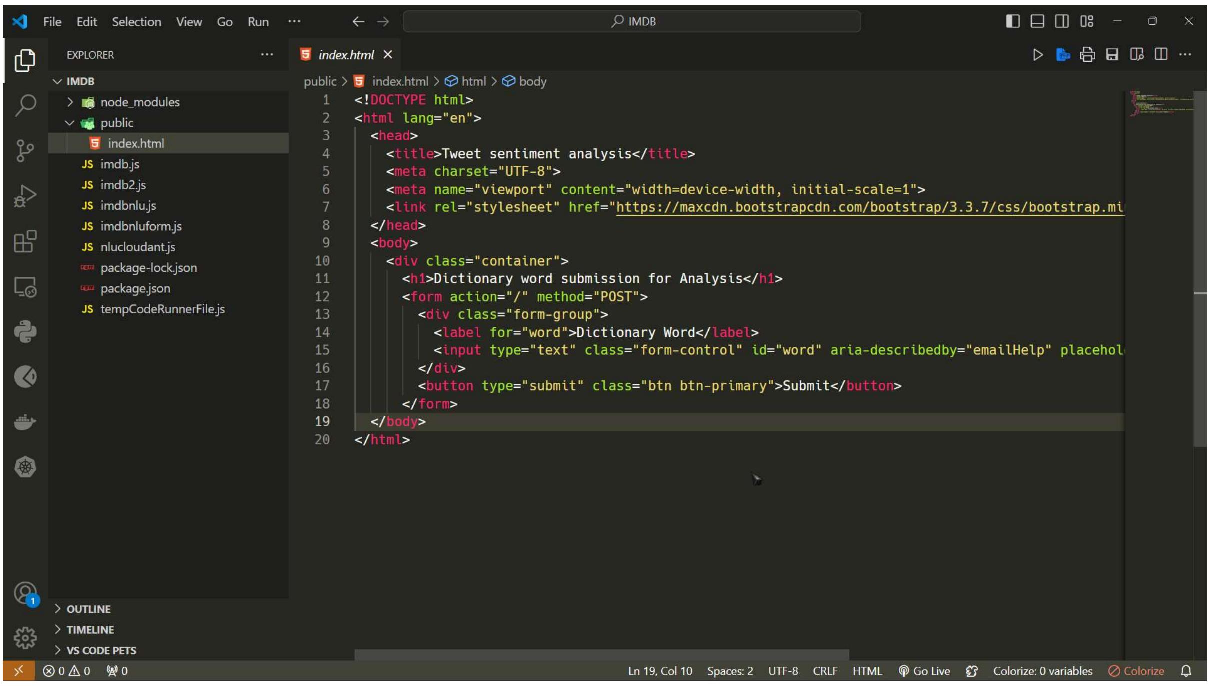
```
async function getData() {
        const analyzeParams = {
                keywords: {},
                sentiment:{},
                emotion:{}
            },
        };
```

```
      },
      {
        "text": "humans",
        "relevance": 0.844133,
        "count": 1
      },
      {
        "text": "wage",
        "relevance": 0.765931,
        "count": 1
      }
    ],
    "entities": [],
    "emotion": {
      "document": {
        "emotion": {
          "sadness": 0.143103,
          "joy": 0.092965,
          "fear": 0.148204,
          "disgust": 0.041328,
          "anger": 0.136275
        }
      }
    }
  }
}
```

➢ Now we will create HTML FORM so we can get input from user.

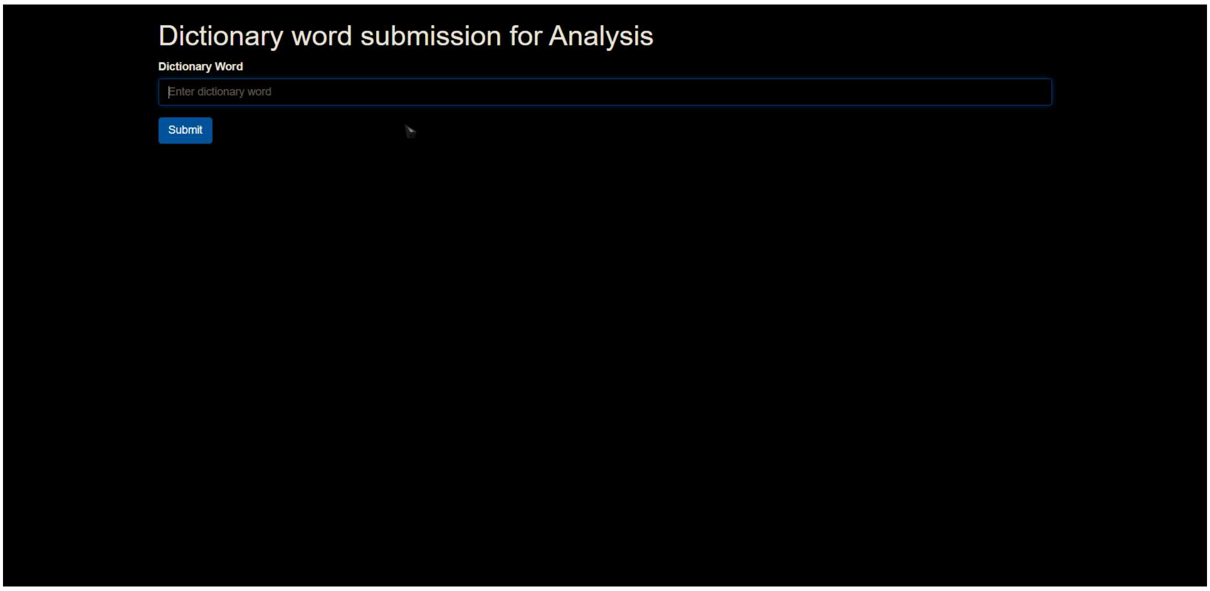


```javascript
const express = require('express');
const bodyParser = require('body-parser');
const app = express();


const port = 8080;
var urlencodedParser = bodyParser.urlencoded({ extended: false })
const axios = require('axios');
const { IamAuthenticator } = require('ibm-watson/auth');
const NaturalLanguageUnderstandingV1 = require('ibm-watson/natural-language-understanding/v1');

// Initialize Watson NLU
const nlu = new NaturalLanguageUnderstandingV1({
    authenticator: new IamAuthenticator({ apikey: 'DOp1iM-8lo9FisfBw5_FHl-g8dsiFZ3RhrdoXBebjNpy'
    version: '2021-03-25',
    serviceUrl: 'https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/
});


app.get('/', (req, res) => {
  res.sendFile(__dirname + '/public/index.html');
});

app.post('/', urlencodedParser, (req, res) => {
    console.log('Got body:', req.body);
x=req.body.dictionary_word;
console.log(x);
///////
const options = {
    method: 'GET',
    url: 'https://mashape-community-urban-dictionary.p.rapidapi.com/define',
    params: {
```



```html
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>Tweet sentiment analysis</title>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.mi
  </head>
  <body>
    <div class="container">
      <h1>Dictionary word submission for Analysis</h1>
      <form action="/" method="POST">
        <div class="form-group">
          <label for="word">Dictionary Word</label>
          <input type="text" class="form-control" id="word" aria-describedby="emailHelp" placehol
        </div>
        <button type="submit" class="btn btn-primary">Submit</button>
      </form>
  </body>
</html>
```

➢ Our application features an HTML form allowing users to input a word from the dictionary, and upon submission, the application will showcase the corresponding emotion linked to that word.

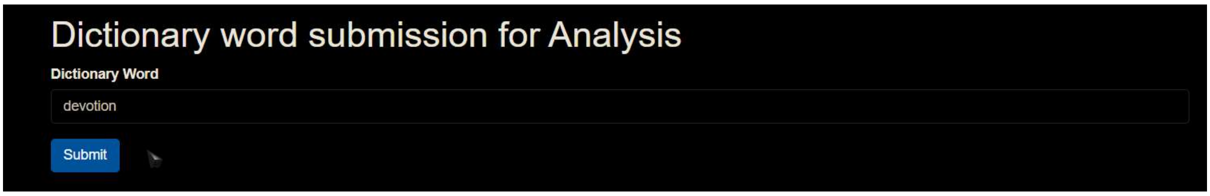


Dictionary word submission for Analysis

Dictionary Word

Enter dictionary word

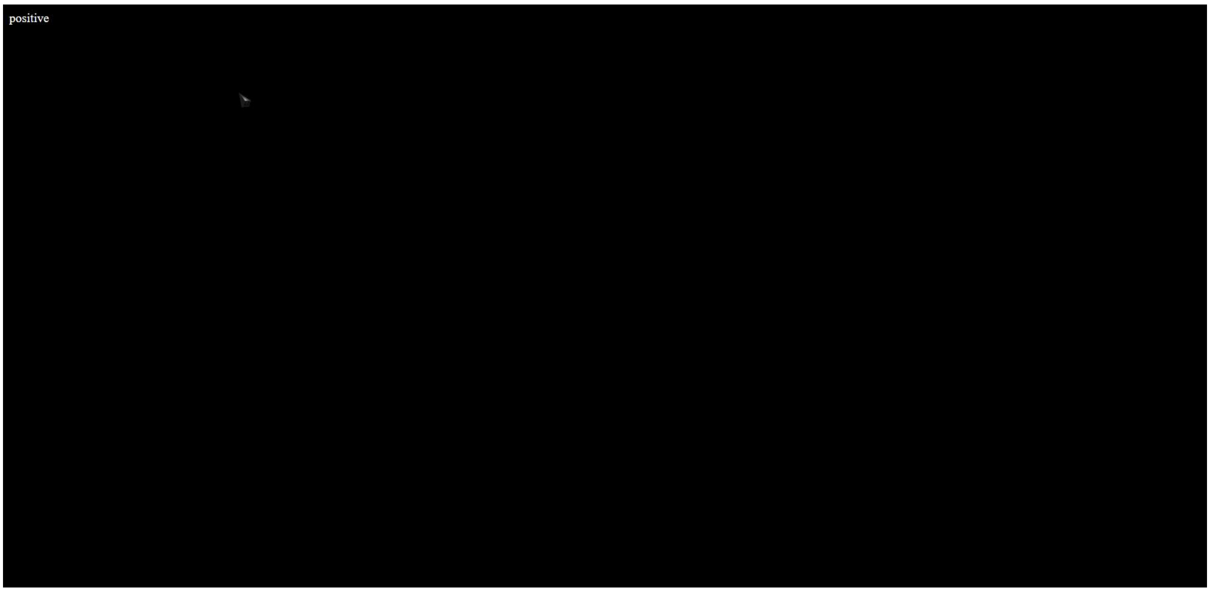
➢ For example, when the user enters the word "devotion," the application identifies it as positive in terms of emotion.



Dictionary word submission for Analysis

Dictionary Word

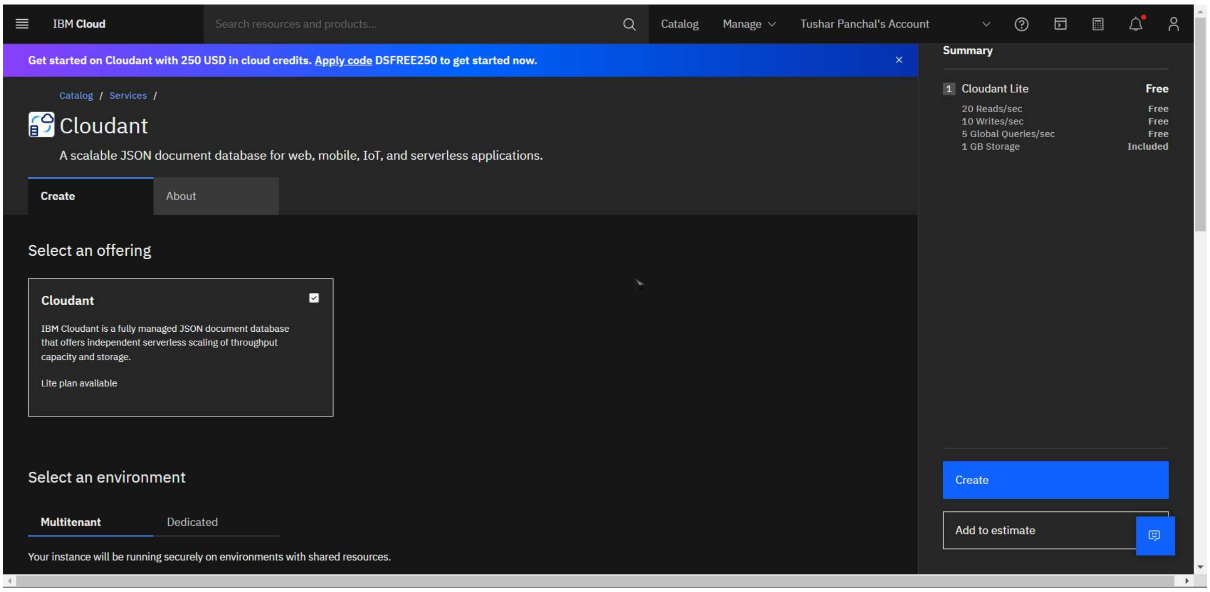
devotion



positive

» Question 3 : Integrate database service to store captured feeds and their results.

➢ Initially, to incorporate the database service into our application, we must create a Cloudant database using the IBM Cloud platform.



Get started on Cloudant with 250 USD in cloud credits. Apply code DSFREE250 to get started now.

Catalog / Services /

Cloudant

A scalable JSON document database for web, mobile, IoT, and serverless applications.

Select an offering

Cloudant ☑

IBM Cloudant is a fully managed JSON document database that offers independent serverless scaling of throughput capacity and storage.

Lite plan available

Select an environment

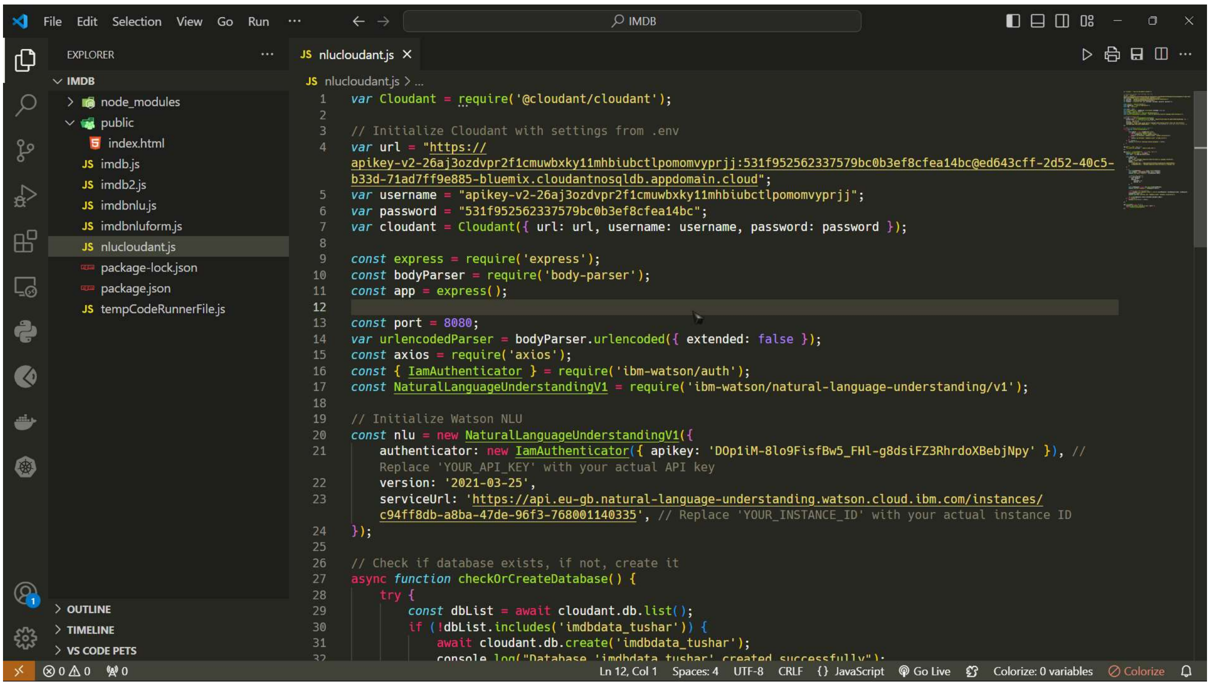
Multitenant | Dedicated

Your instance will be running securely on environments with shared resources.

Summary

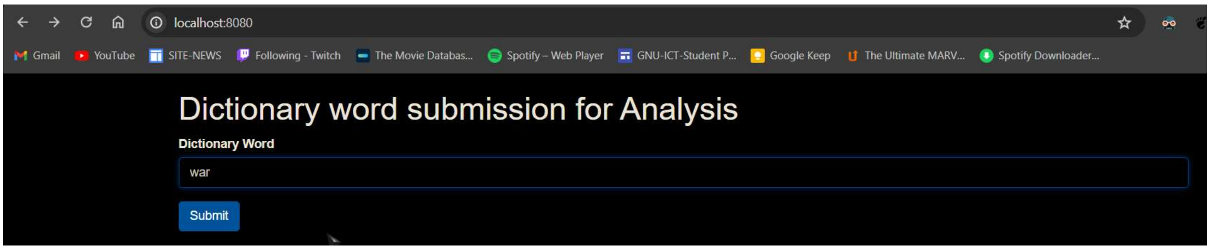
1 Cloudant Lite	Free
20 Reads/sec	Free
10 Writes/sec	Free
5 Global Queries/sec	Free
1 GB Storage	Included

➢ Now we will enter cloudant credentials in our code.



```
var Cloudant = require('@cloudant/cloudant');

// Initialize Cloudant with settings from .env
var url = "https://apikey-v2-26aj3ozdvpr2f1cmuwbxky11mhbiubctlpomomvyprjj:531f952562337579bc0b3ef8cfea14bc@ed643cff-2d52-40c5-b33d-71ad7ff9e885-bluemix.cloudantnosqldb.appdomain.cloud";
var username = "apikey-v2-26aj3ozdvpr2f1cmuwbxky11mhbiubctlpomomvyprjj";
var password = "531f952562337579bc0b3ef8cfea14bc";
var cloudant = Cloudant({ url: url, username: username, password: password });

const express = require('express');
const bodyParser = require('body-parser');
const app = express();

const port = 8080;
var urlencodedParser = bodyParser.urlencoded({ extended: false });
const axios = require('axios');
const { IamAuthenticator } = require('ibm-watson/auth');
const NaturalLanguageUnderstandingV1 = require('ibm-watson/natural-language-understanding/v1');

// Initialize Watson NLU
const nlu = new NaturalLanguageUnderstandingV1({
    authenticator: new IamAuthenticator({ apikey: 'DOp1iM-8lo9FisfBw5_FHl-g8dsiFZ3RhrdoXBebjNpy' }), // Replace 'YOUR_API_KEY' with your actual API key
    version: '2021-03-25',
    serviceUrl: 'https://api.eu-gb.natural-language-understanding.watson.cloud.ibm.com/instances/c94ff8db-a8ba-47de-96f3-768001140335', // Replace 'YOUR_INSTANCE_ID' with your actual instance ID
});

// Check if database exists, if not, create it
async function checkOrCreateDatabase() {
    try {
        const dbList = await cloudant.db.list();
        if (!dbList.includes('imdbdata_tushar')) {
            await cloudant.db.create('imdbdata_tushar');
            console.log("Database 'imdbdata_tushar' created successfully");
```

➢ Upon entering a word into the HTML form, we will not only display the emotion associated with that word but also upload the response of that word into our Cloudant database.

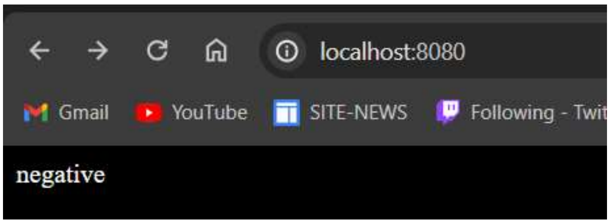


Dictionary word submission for Analysis

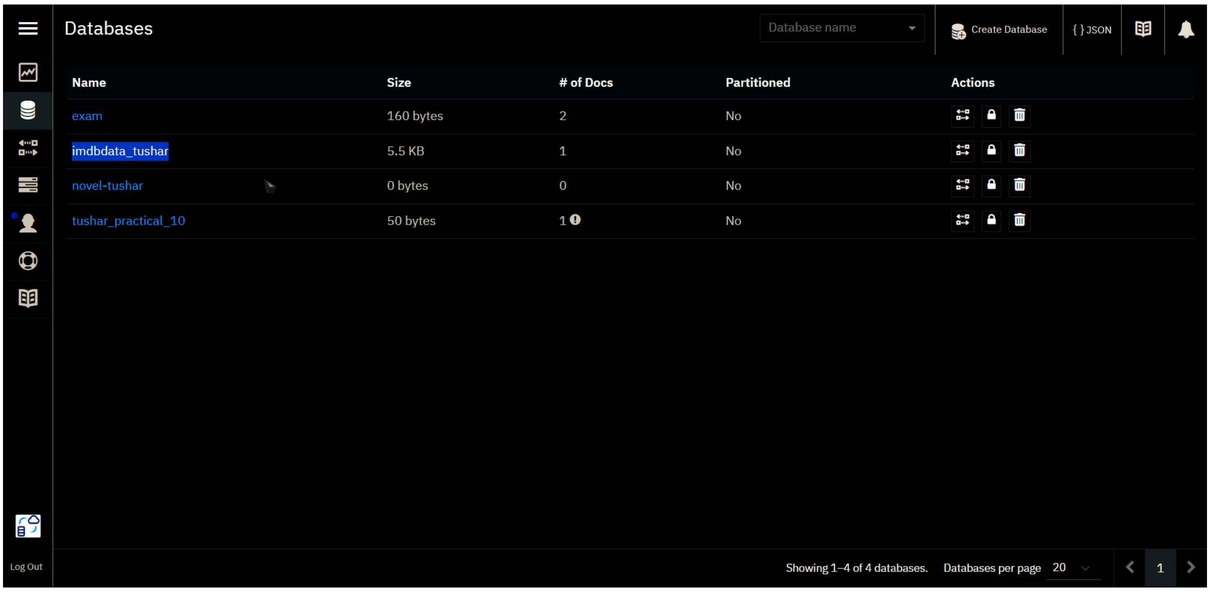
Dictionary Word

war

Submit

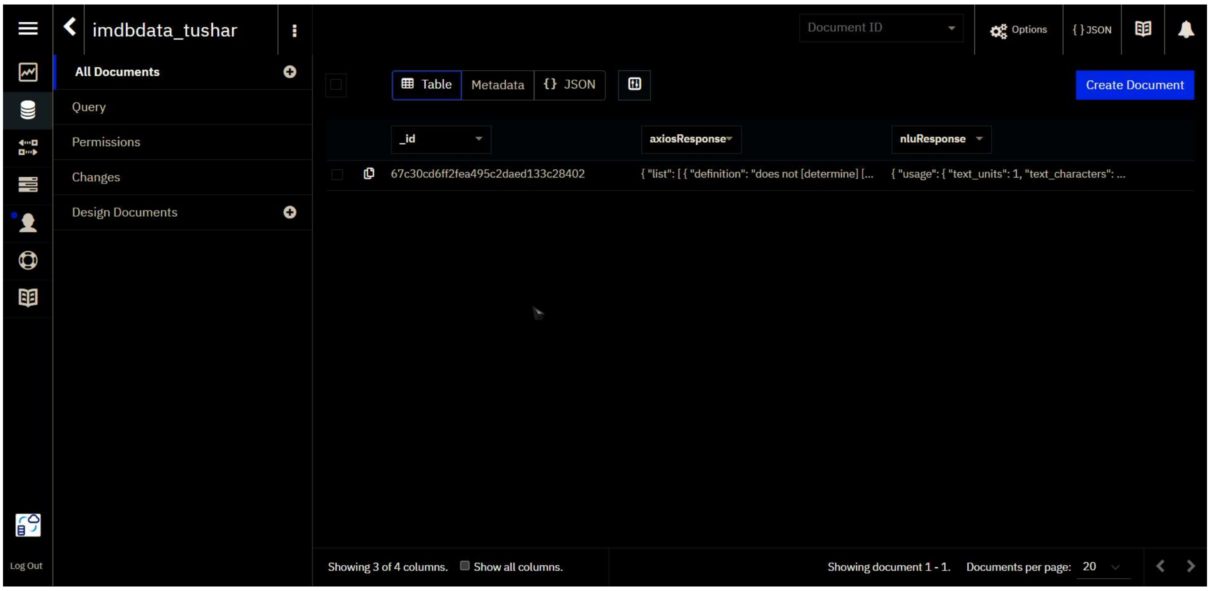


negative



Name	Size	# of Docs	Partitioned	Actions
exam	160 bytes	2	No	
imdbdata_tushar	5.5 KB	1	No	
novel-tushar	0 bytes	0	No	
tushar_practical_10	50 bytes	1	No	

Showing 1–4 of 4 databases. Databases per page 20 1



_id	axiosResponse	nluResponse
67c30cd6ff2fea495c2daed133c28402	{ "list": [{ "definition": "does not [determine] [...	{ "usage": { "text_units": 1, "text_characters": ...

Showing 3 of 4 columns. □ Show all columns.

Showing document 1 - 1. Documents per page: 20

➢ We successfully obtained the emotion response of a dictionary word and stored it in our database.