

# **The University of North Carolina at Charlotte**

## **System Integration**

### **Final Project**

#### **TECHNICAL DOCUMENTATION**

**ITIS 6177**

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**Project Title: Text Translator API**

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## Introduction:

Text translation is the process of converting an original or source text into a text in another language. This project is to develop an API endpoint that interacts with the Microsoft Azure Text Translator API on behalf of the user, eliminating the requirement for the user to sign up for an Azure account, purchase a subscription, and implement the API. There is no cost to the user, and it is easily implemented with simple Rest API calls.

It will convert the text from the source language to the targeted language, detect the source language, get the character count, and phonetic spelling for the given text and provide similar words and examples from a dictionary.

Technologies used are NodeJS Express, Cors, Axios, and swagger Documentation (swagger-UI-express, swagger-jsdoc, swagger-UI).

## Language codes:

The languages must be provided in abbreviated form. The list of abbreviated languages with their codes.

Language codes	Language
Af	Afrikaans
Am	Amharic
Ar	Arabic
As	Assamese
Az	Azerbaijani
Ba	Bashkir
Bg	Bulgarian
Bn	Bangla
Bo	Tibetan
Bs	Bosnian
Ca	Catalan
Cs	Czech
Cy	Welsh
Da	Danish
De	German
Dv	Divehi
El	Greek
En	English
Es	Spanish
Et	Estonian
Fa	Persian
Fi	Finnish
Fil	Filipino

Fj	Fijian
Fr	French
fr-CA	French (Canada)
Ga	Irish
Gu	Gujarati
He	Hebrew
Hi	Hindi
Hr	Croatian
Ht	Haitian Creole
Hu	Hungarian
Hy	Armenian
Id	Indonesian
Is	Icelandic
It	Italian
Iu	Inuktitut
Ja	Japanese
Ka	Georgian
Kk	Kazakh
Km	Khmer
Kmr	Kurdish (Northern)
Kn	Kannada
Ko	Korean
Ku	Kurdish (Central)
Ky	Kyrgyz
Lo	Lao
Lt	Lithuanian
Lv	Latvian
Lzh	Chinese (Literary)
Mg	Malagasy
Mi	Māori
Mk	Macedonian
Ml	Malayalam
mn-Cyrl	Mongolian (Cyrillic)
mn-Mong	Mongolian (Traditional)
Mr	Marathi
Ms	Malay
Mt	Maltese
Mww	Hmong Daw
My	Myanmar (Burmese)
Nb	Norwegian
Ne	Nepali
Nl	Dutch

Or	Odia
Otq	Querétaro Otomi
Pa	Punjabi
Pl	Polish
Prs	Dari
Ps	Pashto
Pt	Portuguese (Brazil)
pt-PT	Portugese (Portugal)
Ro	Romanian
Ru	Russian
Sk	Slovak
Sl	Slovenian
Sm	Samoan
Sq	Albanian
sr-Cyrl	Serbian (Cyrillic)
sr-Latn	Serbian (Latin)
Sv	Swedish
Sw	Swahili
Ta	Tamil
Te	Telugu
Th	Thai
Ti	Tigrinya
Tk	Turkmen
tlh-Latin	Klingon (Latin)
tlh-Piqd	Klingon (pIqaD)
To	Tongan
Tr	Turkish
Tt	Tatar
Ty	Tahitian
Ug	Uyghur
Uk	Ukrainian
Ur	Urdu
Uz	Uzbek (Latin)
yua	Yucatec Maya
yue	Cantonese (Traditional)
zh-Hans	Chinese Simplified
zh-Hant	Chinese Traditional
Vi	Vietnamese

**Text Translation Features:****Translate:**

Converts source language text into targeted language text.

**Transliterate:**

Transliteration is the process of converting a word or phrase from one language's script to another based on phonetic similarity.

**Detect:**

Provides the source code language code and a Boolean variable indicating if the detected language is compatible for text translation and transliteration.

**Dictionary lookup:**

Provides similar words in the target language for the original word.

**Dictionary example:**

Provides examples of grammatical structure and context for the source and target word combination.

**End Points for Text Translator:****GET Method:**

**Languages:** Get all Languages and language codes that are supported by the API.

**Request URL:** <http://142.93.52.32:3000/language>

**Method:** GET

**End Point:** Language

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

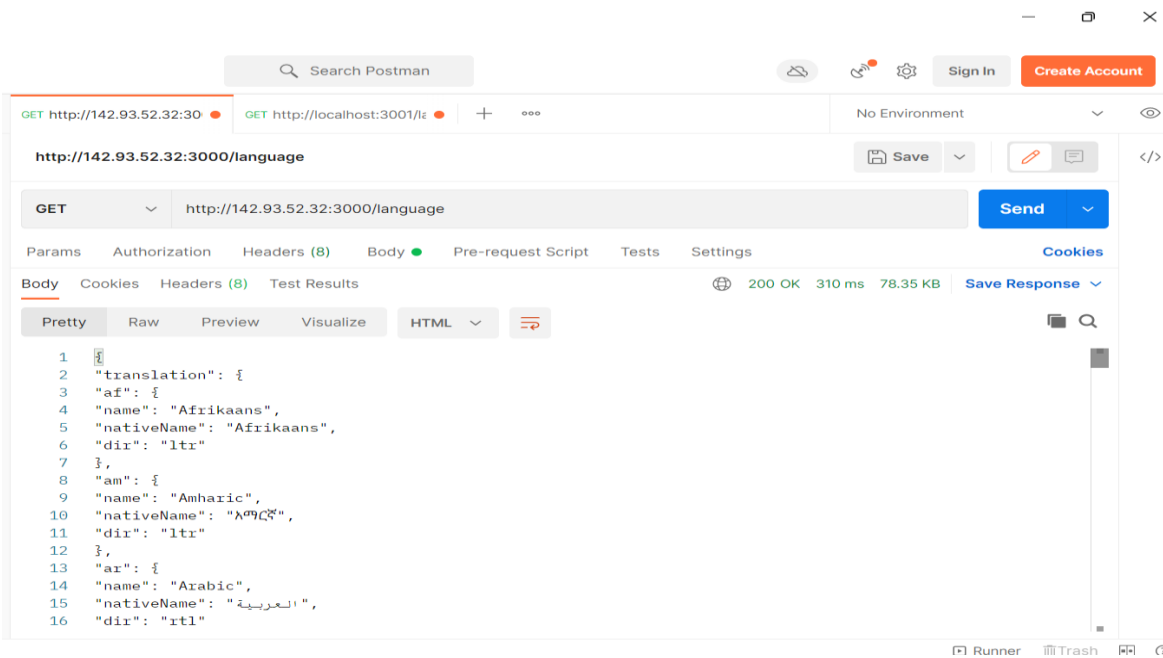
'Content-type': 'application/json',

**Response status codes:**

200 Successful operations

400 Invalid Inputs

500 Server error



## Output:

```

{
  "translation": {
    "af": {
      "name": "Afrikaans",
      "nativeName": "Afrikaans",
      "dir": "ltr"
    },
    "am": {
      "name": "Amharic",
      "nativeName": "አማርኛ",
      "dir": "ltr"
    },
    "ar": {
      "name": "Arabic",
      "nativeName": "العربية",
      "dir": "rtl"
    }
  }
}

```

## Post Methods:

**1. Translate:** Converts text from source language text to targeted language text.

**Request URL:** <http://142.93.52.32:3000/api/convert>

**Method:** post

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

'Content-type': 'application/json',

**Body Request:**

from: Language to translate from. (Required)

to: Language to translate to. (Required)

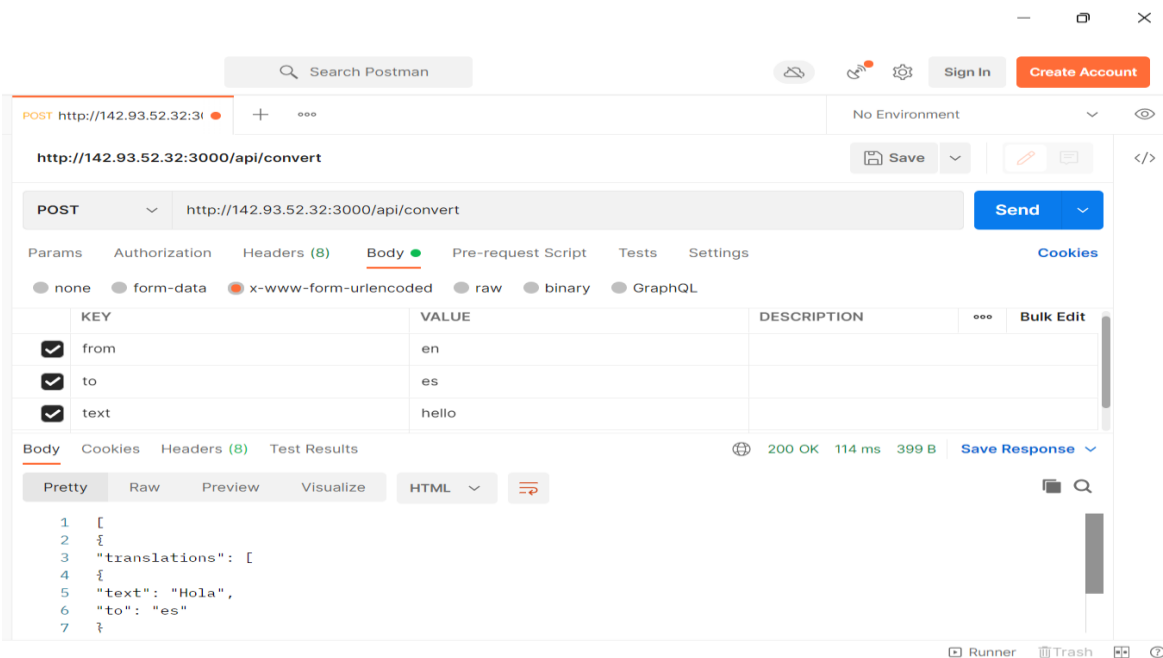
text: Text to translate. (Required)

**Response status codes:**

200 Successful operations

400 Invalid Inputs

500 Server error

**Output:**

```

[
  {
    "translations": [
      {

```



```

        "text": "Hola",
        "to": "es"
    }
]
}
]
```

**2. Detect:** Detects the language of the given text.

**End Point:** <http://142.93.52.32:3000/api/identify>

**Method:** post

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

'Content-type': 'application/json',

**Body Request:**

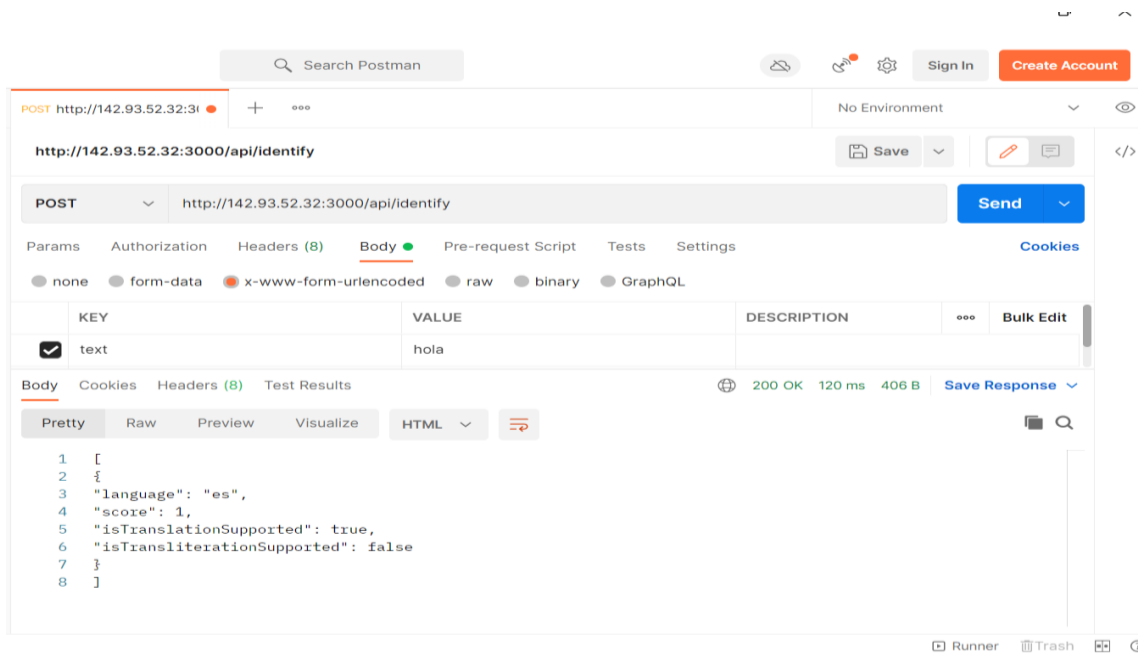
text: Text to translate. (Required)

**Response status codes:**

200 Successful operations

400 Invalid Inputs

500 Server error



## Output:

```
[
  {
    "language": "es",
    "score": 1,
    "isTranslationSupported": true,
    "isTransliterationSupported": false
  }
]
```

## 3. Length: Get character counts for both source text and translation output

### 3.1 Get sentence length with translation

End Point: <http://142.93.52.32:3000/api/senlength>

Method: post

#### Headers:

'Ocp-Apim-Subscription-Key': Key,  
 'Ocp-Apim-Subscription-Region': location,  
 'Content-type': 'application/json',

#### Body Request:

to: Language to translate to. (Required)

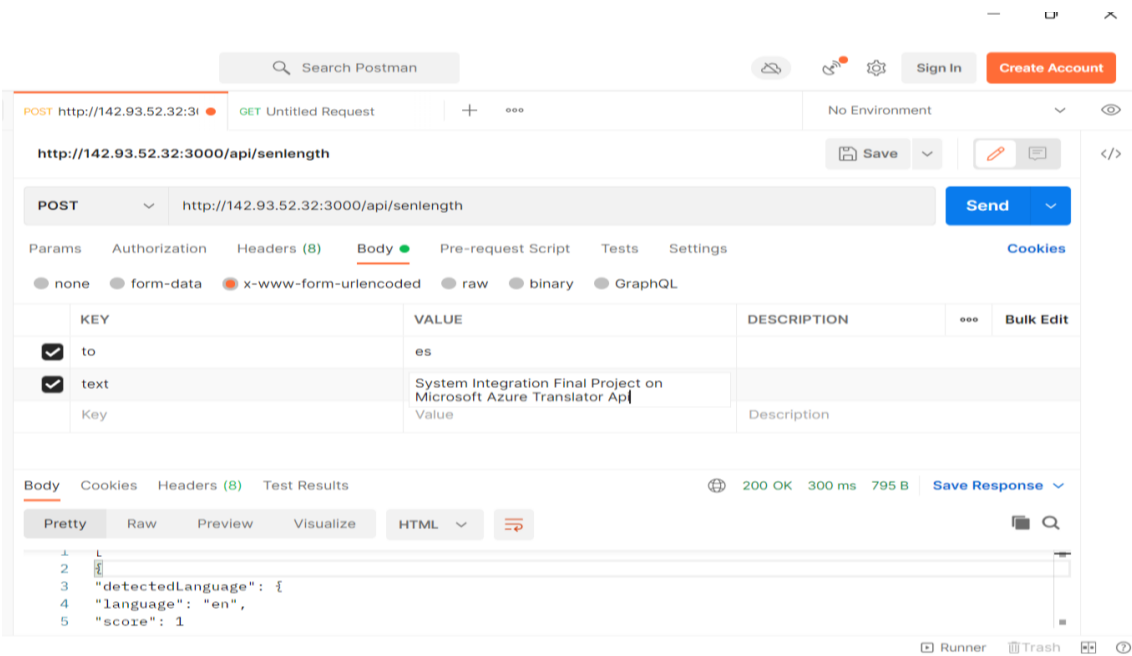
text: Text to translate. (Required)

## Response status codes:

200 Successful operations

400 Invalid Inputs

500 Server error



## Output:

```
[
  {
```

```

    "detectedLanguage": {
      "language": "en",
      "score": 1
    },
    "translations": [
      {
        "text": "Proyecto final de integración de sistemas en la API de Traductor de Microsoft
Azure.",
        "to": "es",
        "sentLen": {
          "srcSentLen": [
            67
          ],
          "transSentLen": [
            84
          ]
        }
      }
    ]
  }
}

```

### 3.2 Get sentence length without translation

**End Point:** <http://142.93.52.32:3000/api/length>

**Method:** post

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

'Content-type': 'application/json',

**Body Request:**

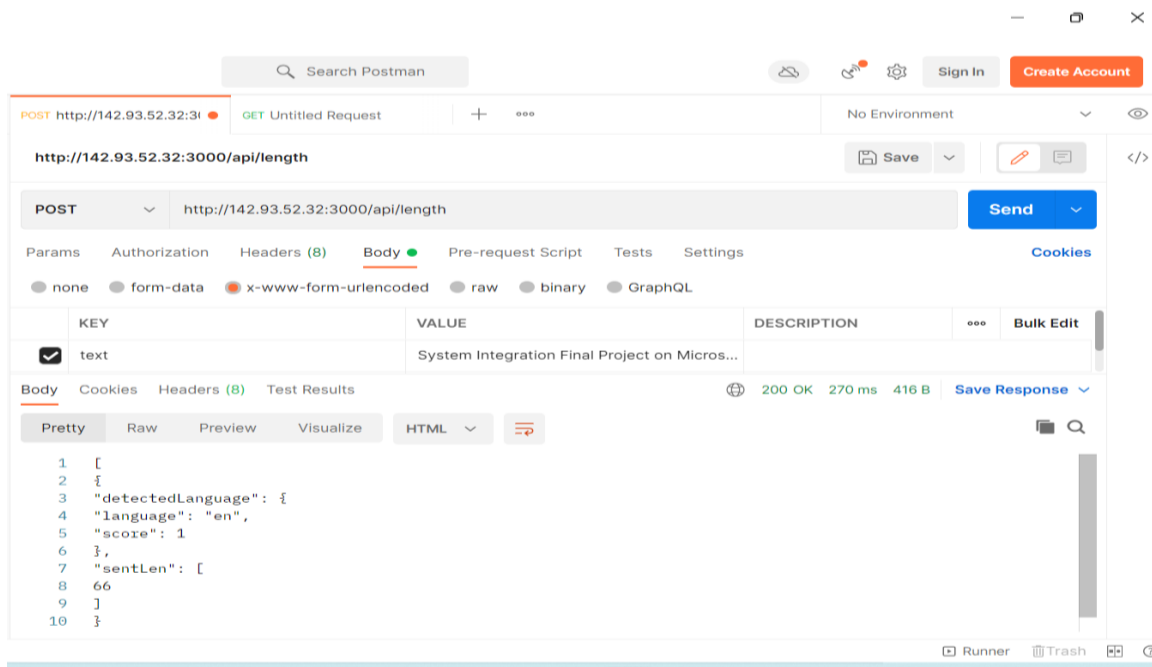
text: Text to translate. (Required)

**Response status codes:**

200 Successful operations

400 Invalid Inputs

500 Server error



## Output:

```
[
  {
    "detectedLanguage": {
      "language": "en",
      "score": 1
    },
    "sentLen": [
      67
    ]
  }
]
```

**4. Transliterate:** Process of converting a word or phrase from one language's script to another based on phonetic similarity

## Transliterate with translation

**4.1 End Point:** <http://142.93.52.32:3000/api/transliterate>

**Method:** post

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

'Content-type': 'application/json',

### Body Request:

to: Language to translate from. (Required)

toScript: List of scripts translate. (Required)

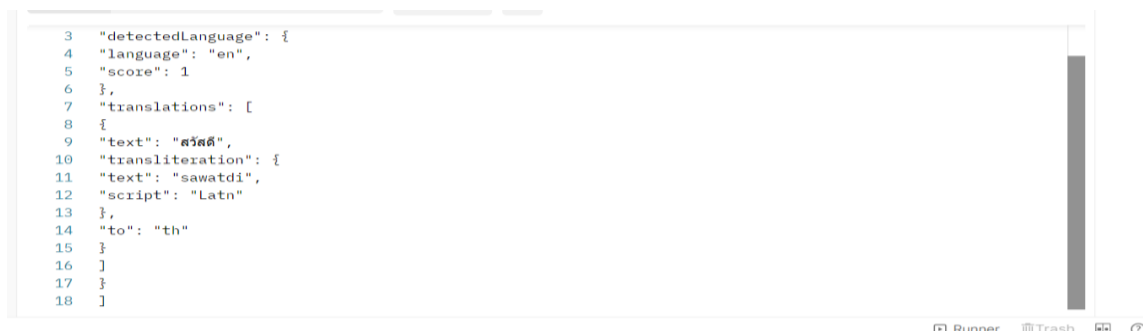
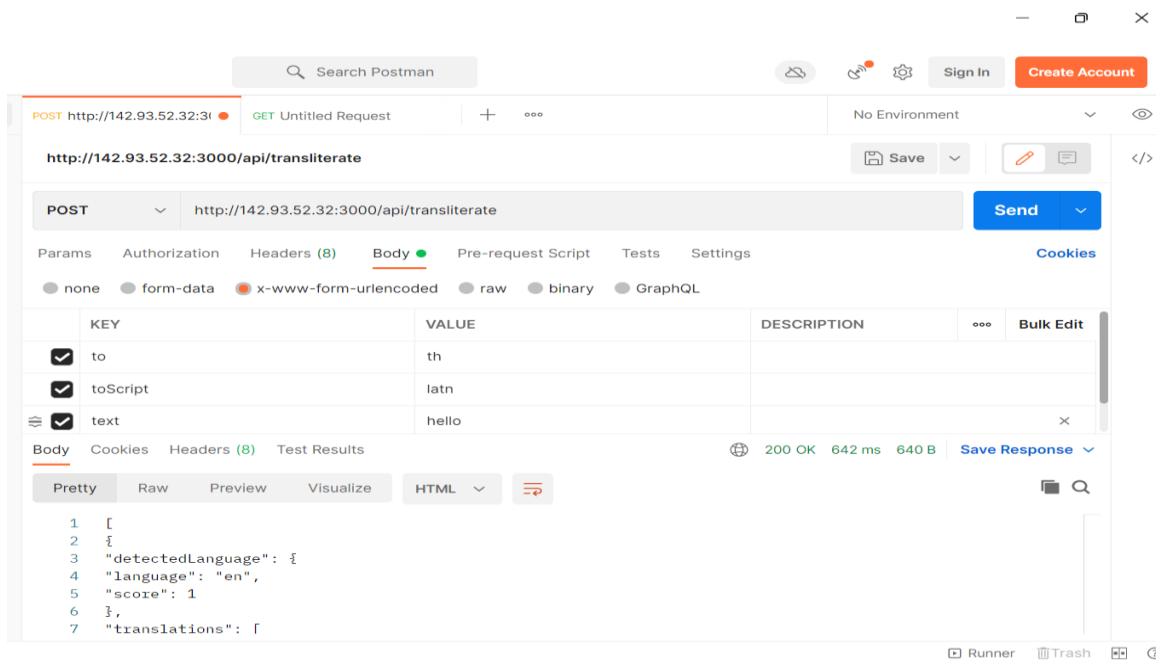
text: Text to translate. (Required)

### Response status codes:

200 Successful operations

400 Invalid Inputs

500 Server error



**Output:**

```
[
  {
    "detectedLanguage": {
      "language": "en",
      "score": 1
    },
    "translations": [
      {
        "text": "สวัสดี",
        "transliteration": {
          "text": "sawatdi",
          "script": "Latn"
        },
        "to": "th"
      }
    ]
  }
]
```

**4.2 End Point:** <http://142.93.52.32:3000/api/notransliterate>

**Transliterate without translation**

**Method:** post

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

'Content-type': 'application/json',

**Body Request:**

Language: text to be translated from

fromScript: Language name. (Required)

toScript: List of scripts translate. (Required)

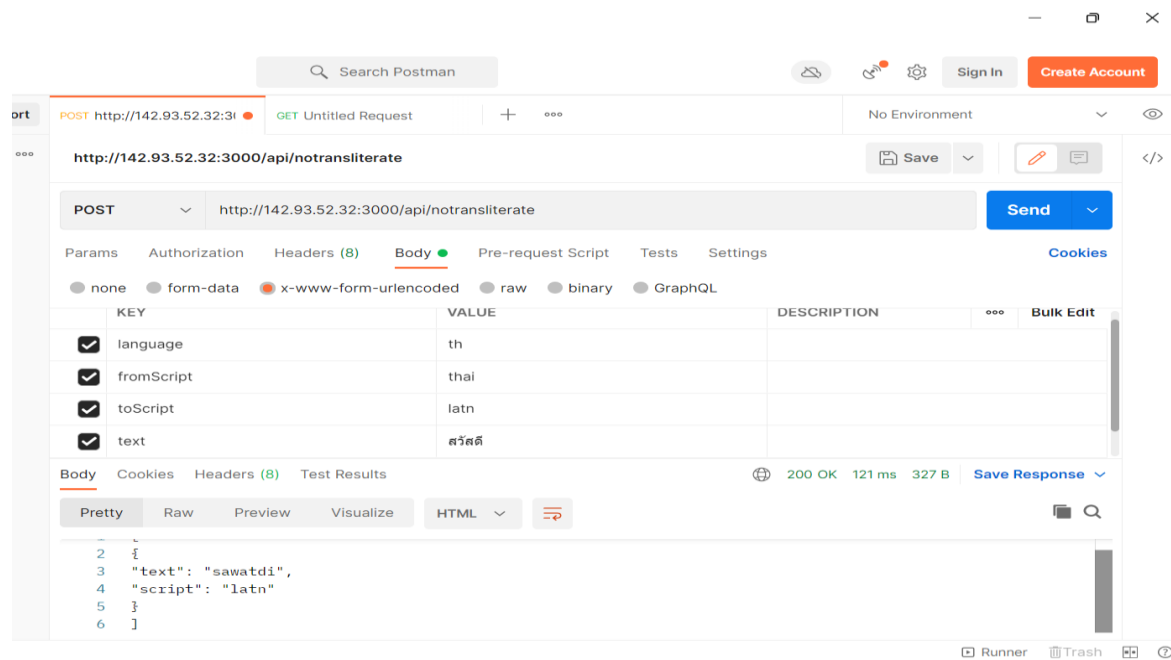
text: Text to translate. (Required)

**Response status codes:**

200 Successful operations

400 Invalid Inputs

500 Server error



## Output:

```
[
  {
    "text": "sawatdi",
    "script": "latn"
  }
]
```

**5. Dictionary lookup:** Returns equivalent words for the source term in the target language.

**End Point:** <http://142.93.52.32:3000/api/dlookup>

**Method:** post

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

'Content-type': 'application/json',



**Body Request:**

from: Language to translate from. (Required)

to: Language to translate to. (Required)

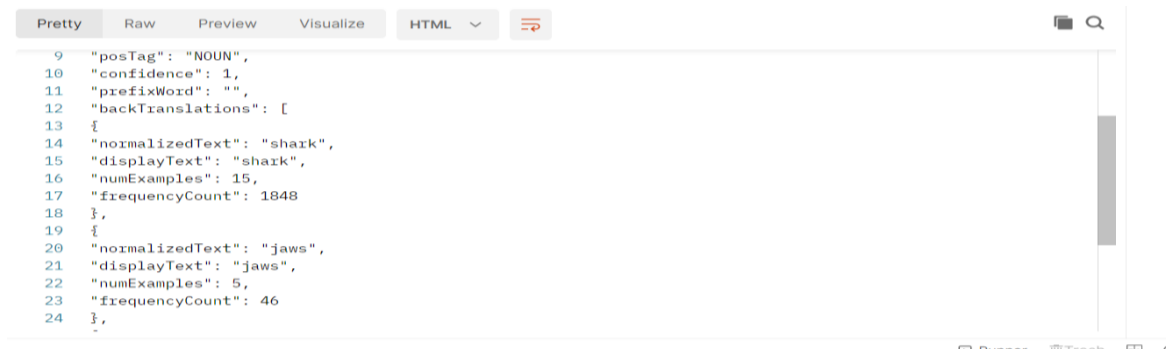
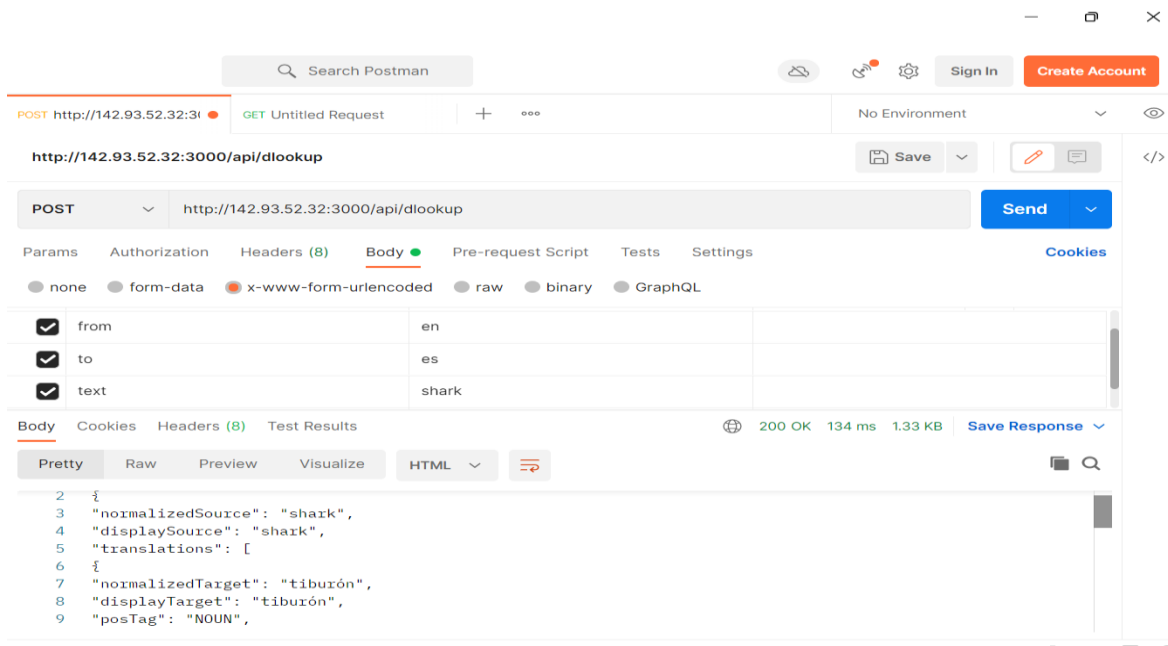
text: Text to translate. (Required)

**Response status codes:**

200 Successful operations

400 Invalid Inputs

500 Server error



```

Pretty Raw Preview Visualize HTML ↕
20 "normalizedText": "jaws",
21 "displayText": "jaws",
22 "numExamples": 5,
23 "frequencyCount": 46
24 },
25 {
26 "normalizedText": "tiburon",
27 "displayText": "Tiburon",
28 "numExamples": 0,
29 "frequencyCount": 16
30 }
31 ]
32 }
33 ]
34 }
35 ]
Runner Trash ?

```

## Output:

```

[
  {
    "normalizedSource": "shark",
    "displaySource": "shark",
    "translations": [
      {
        "normalizedTarget": "tiburón",
        "displayTarget": "tiburón",
        "posTag": "NOUN",
        "confidence": 1,
        "prefixWord": "",
        "backTranslations": [
          {
            "normalizedText": "shark",
            "displayText": "shark",
            "numExamples": 15,
            "frequencyCount": 1848
          },
          {
            "normalizedText": "jaws",
            "displayText": "jaws",
            "numExamples": 5,
            "frequencyCount": 46
          },
          {
            "normalizedText": "tiburon",
            "displayText": "Tiburon",
            "numExamples": 0,
            "frequencyCount": 16
          }
        ]
      }
    ]
  }
]

```

```
    ]
  }
]
```

**6. Dictionary example:** Provides examples of grammatical structure and context for the source and target word combination.

**End Point:** <http://142.93.52.32:3000/api/dexamples>

**Method:** post

**Headers:**

'Ocp-Apim-Subscription-Key': Key,

'Ocp-Apim-Subscription-Region': location,

'Content-type': 'application/json',

**Body Request:**

from: Language to translate from. (Required)

to: Language to translate to. (Required)

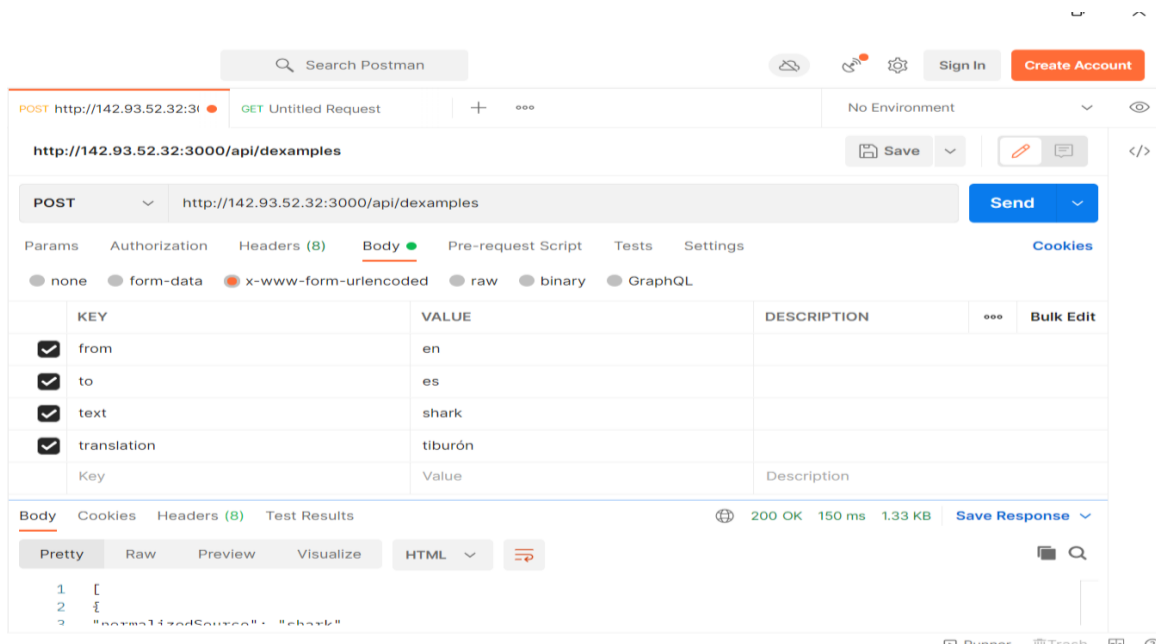
text: Text to translate. (Required)

**Response status codes:**

200 Successful operations

400 Invalid Inputs

500 Server error



```

1  [
2  {
3    "normalizedSource": "shark",
4    "displaySource": "shark",
5    "translations": [
6    {
7      "normalizedTarget": "tiburón",
8      "displayTarget": "tiburón",
9      "posTag": "NOUN",
10     "confidence": 1,
11     "prefixWord": "",
12     "backTranslations": [
13     {
14       "normalizedText": "shark",
15       "displayText": "shark",
16       "numExamples": 15,

```

## Output:

```

[
  {
    "normalizedSource": "shark",
    "displaySource": "shark",
    "translations": [
      {
        "normalizedTarget": "tiburón",
        "displayTarget": "tiburón",
        "posTag": "NOUN",
        "confidence": 1,
        "prefixWord": "",
        "backTranslations": [
          {
            "normalizedText": "shark",
            "displayText": "shark",
            "numExamples": 15,
            "frequencyCount": 1848
          },
          {
            "normalizedText": "jaws",

```

```

        "displayText": "jaws",
        "numExamples": 5,
        "frequencyCount": 46
    },
    {
        "normalizedText": "tiburon",
        "displayText": "Tiburon",
        "numExamples": 0,
        "frequencyCount": 16
    }
]
}
]

```

### Swagger Documentation URL:

<http://142.93.52.32:3000/docs/>

### URL Accesses to End Points:

<http://142.93.52.32:3000/>

### Error codes:

400000	One of the request inputs isn't valid.
500000	An unexpected error occurred. (Server error)

### References:

- <https://azure.microsoft.com/en-us/services/cognitive-services/translator/>
- <https://docs.microsoft.com/en-us/azure/cognitive-services/translator/quickstart-translator?tabs=csharp>
- <https://docs.microsoft.com/en-us/azure/cognitive-services/translator/text-translation-overview>
- <https://docs.microsoft.com/en-us/azure/cognitive-services/translator/language-support>
- <https://docs.microsoft.com/en-us/azure/cognitive-services/translator/reference/v3-0-translate#translate-to-multiple-languages>
- <https://docs.microsoft.com/en-us/azure/cognitive-services/translator/reference/v3-0-transliterate>