COSC310 SOFTWARE ENGINEERING

Project Report

Individual Project

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Personal Project Repository URL

1.0 Updated README Documentation

1.1 Project Description

The objective of this programming project is integrate APIs into our previous chatbot code. APIs are Application Programming Interfaces which acts as an intermediary that allows two applications to talk to each other. The projects original aim is to create a dynamic conversational agent that is able to interact and respond to a user's input. Within the chosen setup, the agent will imitate an old friend and enable the user to participate in conversations centering around topics such as favourite food, hobbies, and books. To further the abilities of the bot, APIs are used. For this project, I am implementing Google Translate API and Twitter API. The Google Translate API will allow my chatbot application to connect with google translate. This allows the bots output to be translated into other languages as well as allow the user to input text in different languages which will be translated into English for the bot.

1.2 API Overview

The chosen APIs to be implemented with the bot are:

1. Google translate API: With the google translate API, the chatbot will be able to connect with the google translate program and use its ability to translate text. This will allow the bot to output text in languages other than English. Additionally, the bot will also be able to translate user inputs from different languages into English and work off that input. As the chatbot is designed to be a friend, the feature will be very useful in allow the bot to chat and be a friend to people from different parts of the world

2. Wikipedia API: The Wikipedia API connects the bot to the wiki and allows the bot to pull data from it. This provides the bot with knowledge on a variety of subjects and so increases the number of topics the bot can talk about. By combining the definitions pulled from Wikipedia with the other features the bot already possesses, it will be able to give more fleshed out and in-depth responses.

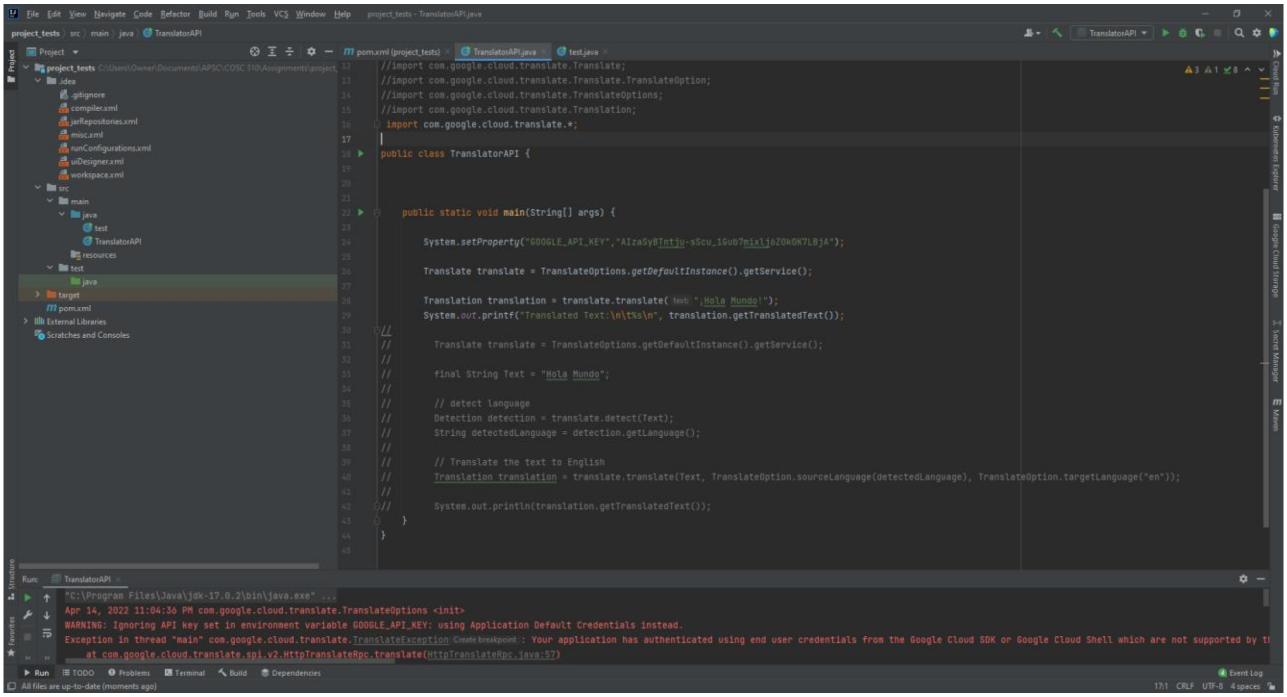
2.0 Features and Bugs

2.1 Features

The first newly implemented feature assisting the improvement of the chatbot was the addition of language translation. Previously, the chatbot was only able to understand inputs in English and provide outputs in the same language. With google translate API, it is able to first detect the language of the user input and translate that to English if it is not already so the bots backend can process it. It is then able to save this as the last language used and translate late its output into said language back to the user. Hence, this allows for a full conversation in multiple languages to take place.

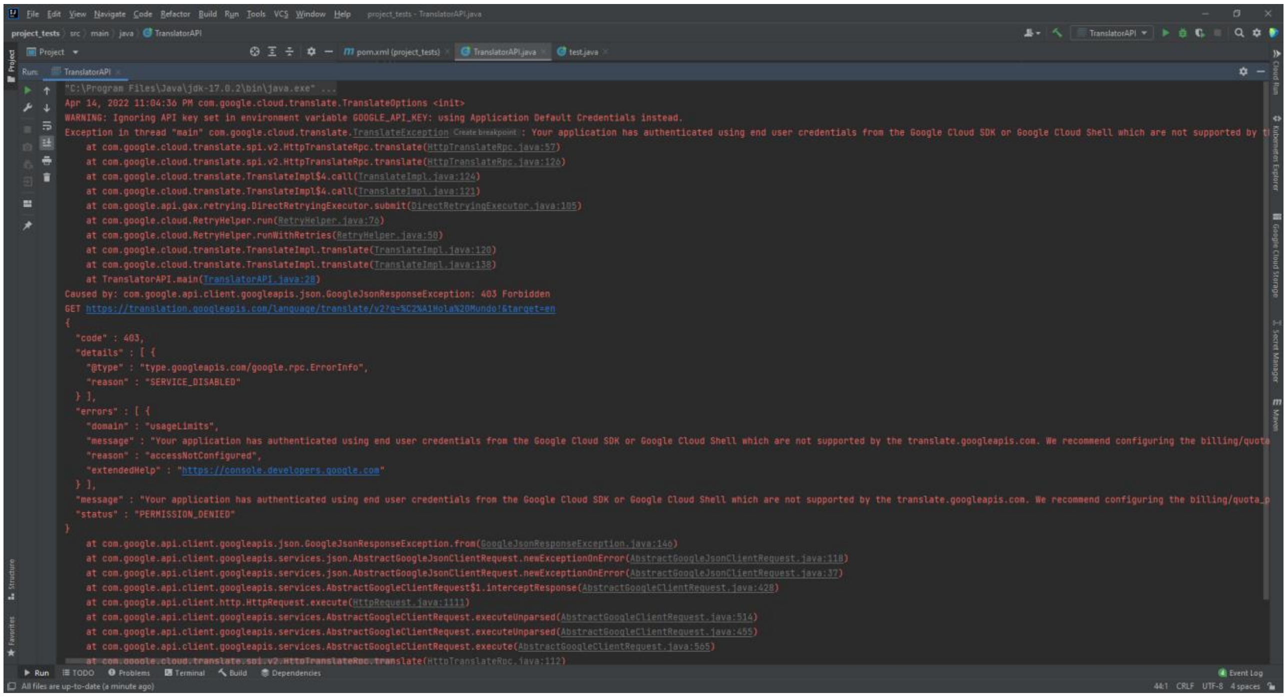
2.2 Bugs

A major bug I encountered was credential access to the google cloud API service. Although, all steps to implement the translate API were followed, I still encountered an error where my program seems to be authenticating with the wrong credentials and so failing to access the service. A screenshot of the code and accompanying error can be found below



```java
//import com.google.cloud.translate.Translate;
//import com.google.cloud.translate.Translate.TranslateOption;
//import com.google.cloud.translate.TranslateOptions;
//import com.google.cloud.translate.Translation;
 import com.google.cloud.translate.*;

public class TranslatorAPI {


    public static void main(String[] args) {

        System.setProperty("GOOGLE_API_KEY","AIzaSyBIntju-sScu_1Gub7mixlj6Z0K0K7LBjA");

        Translate translate = TranslateOptions.getDefaultInstance().getService();

        Translation translation = translate.translate( "¡Hola Mundo!");
        System.out.printf("Translated Text:\n\t%s\n", translation.getTranslatedText());
//
//          Translate translate = TranslateOptions.getDefaultInstance().getService();
//
//          final String Text = "Hola Mundo";
//
//          // detect language
//          Detection detection = translate.detect(Text);
//          String detectedLanguage = detection.getLanguage();
//
//          // Translate the text to English
//          Translation translation = translate.translate(Text, TranslateOption.sourceLanguage(detectedLanguage), TranslateOption.targetLanguage("en"));
//
//          System.out.println(translation.getTranslatedText());
    }
}
```

```
"C:\Program Files\Java\jdk-17.0.2\bin\java.exe" ...
Apr 14, 2022 11:04:36 PM com.google.cloud.translate.TranslateOptions <init>
WARNING: Ignoring API key set in environment variable GOOGLE_API_KEY: using Application Default Credentials instead.
Exception in thread "main" com.google.cloud.translate.TranslateException Create breakpoint : Your application has authenticated using end user credentials from the Google Cloud SDK or Google Cloud Shell which are not supported by tl
    at com.google.cloud.translate.spi.v2.HttpTranslateRpc.translate(HttpTranslateRpc.java:57)
```



```
"C:\Program Files\Java\jdk-17.0.2\bin\java.exe" ...
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Exception in thread "main" com.google.cloud.translate.TranslateException : Your application has authenticated using end user credentials from the Google Cloud SDK or Google Cloud Shell which are not supported by t
    at com.google.cloud.translate.spi.v2.HttpTranslateRpc.translate(HttpTranslateRpc.java:57)
    at com.google.cloud.translate.spi.v2.HttpTranslateRpc.translate(HttpTranslateRpc.java:126)
    at com.google.cloud.translate.TranslateImpl$4.call(TranslateImpl.java:124)
    at com.google.cloud.translate.TranslateImpl$4.call(TranslateImpl.java:121)
    at com.google.api.gax.retrying.DirectRetryingExecutor.submit(DirectRetryingExecutor.java:105)
    at com.google.cloud.RetryHelper.run(RetryHelper.java:76)
    at com.google.cloud.RetryHelper.runWithRetries(RetryHelper.java:50)
    at com.google.cloud.translate.TranslateImpl.translate(TranslateImpl.java:120)
    at com.google.cloud.translate.TranslateImpl.translate(TranslateImpl.java:138)
    at TranslatorAPI.main(TranslatorAPI.java:28)
Caused by: com.google.api.client.googleapis.json.GoogleJsonResponseException: 403 Forbidden
GET https://translation.googleapis.com/language/translate/v2?q=%C2%A1Hola%20Mundo!&target=en
{
  "code" : 403,
  "details" : [ {
    "@type" : "type.googleapis.com/google.rpc.ErrorInfo",
    "reason" : "SERVICE_DISABLED"
  } ],
  "errors" : [ {
    "domain" : "usageLimits",
    "message" : "Your application has authenticated using end user credentials from the Google Cloud SDK or Google Cloud Shell which are not supported by the translate.googleapis.com. We recommend configuring the billing/quota
    "reason" : "accessNotConfigured",
    "extendedHelp" : "https://console.developers.google.com"
  } ],
  "message" : "Your application has authenticated using end user credentials from the Google Cloud SDK or Google Cloud Shell which are not supported by the translate.googleapis.com. We recommend configuring the billing/quota_p
  "status" : "PERMISSION_DENIED"
}
    at com.google.api.client.googleapis.json.GoogleJsonResponseException.from(GoogleJsonResponseException.java:146)
    at com.google.api.client.googleapis.services.json.AbstractGoogleJsonClientRequest.newExceptionOnError(AbstractGoogleJsonClientRequest.java:118)
    at com.google.api.client.googleapis.services.json.AbstractGoogleJsonClientRequest.newExceptionOnError(AbstractGoogleJsonClientRequest.java:37)
    at com.google.api.client.googleapis.services.AbstractGoogleClientRequest$1.interceptResponse(AbstractGoogleClientRequest.java:428)
    at com.google.api.client.http.HttpRequest.execute(HttpRequest.java:1111)
    at com.google.api.client.googleapis.services.AbstractGoogleClientRequest.executeUnparsed(AbstractGoogleClientRequest.java:514)
    at com.google.api.client.googleapis.services.AbstractGoogleClientRequest.executeUnparsed(AbstractGoogleClientRequest.java:455)
    at com.google.api.client.googleapis.services.AbstractGoogleClientRequest.execute(AbstractGoogleClientRequest.java:565)
    at com.google.cloud.translate.spi.v2.HttpTranslateRpc.translate(HttpTranslateRpc.java:112)
```
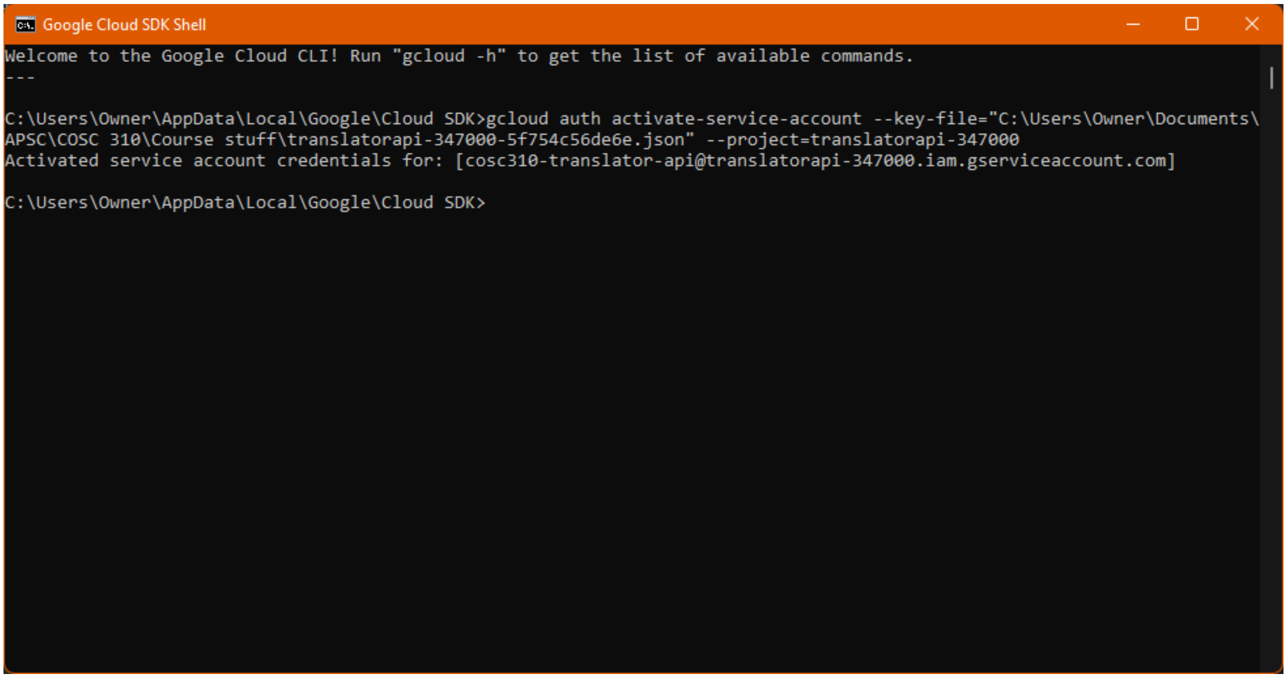

File Edit View Navigate Code Refactor Build Run Tools VCS Window Help
project_tests - TranslatorAPI.java
project_tests › src › main › java › TranslatorAPI
Project
pom.xml (project_tests)
TranslatorAPI.java
test.java
Run: TranslatorAPI
Run
TODO
Problems
Terminal
Build
Dependencies
All files are up-to-date (a minute ago)

Despite several attempts to fix the error and utilize other methods including authorizing the service account through Google Cloud SDK Shell, the error persisted and so prevented further progress.



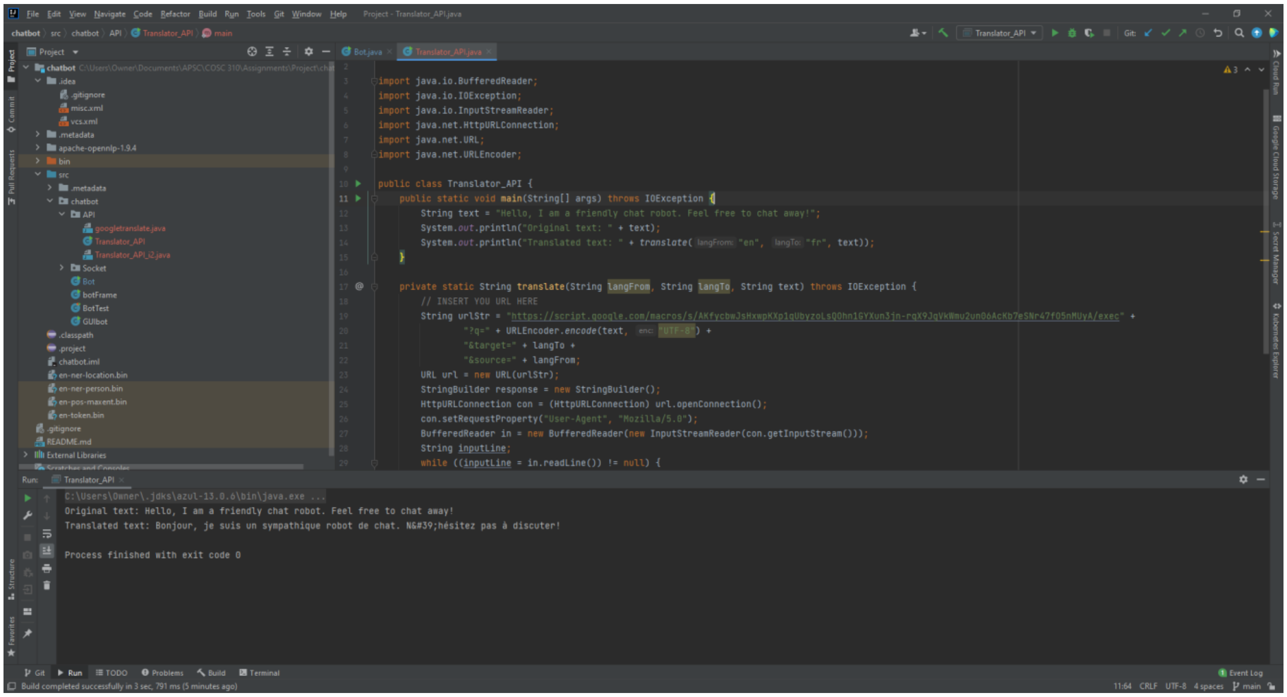
```
Welcome to the Google Cloud CLI! Run "gcloud -h" to get the list of available commands.
---

C:\Users\Owner\AppData\Local\Google\Cloud SDK>gcloud auth activate-service-account --key-file="C:\Users\Owner\Documents\
APSC\COSC 310\Course stuff\translatorapi-347000-5f754c56de6e.json" --project=translatorapi-347000
Activated service account credentials for: [cosc310-translator-api@translatorapi-347000.iam.gserviceaccount.com]

C:\Users\Owner\AppData\Local\Google\Cloud SDK>
```

2.3 Implementation

Should the error not have been present, a chatbot object can simply be created and tied to accept input and output via the translator class and so access text in various languages.

2.4 Alternate Methods

As directly accessing the Google Translate APiI did not work, I used Google scripts to access the API which yield better results.   A separated script for the translator is written online and this can be accessed with my program to translate any texts inputted as picture below



```java
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.URL;
import java.net.URLEncoder;

public class Translator_API {
    public static void main(String[] args) throws IOException {
        String text = "Hello, I am a friendly chat robot. Feel free to chat away!";
        System.out.println("Original text: " + text);
        System.out.println("Translated text: " + translate( "en",  "fr", text));
    }

    private static String translate(String langFrom, String langTo, String text) throws IOException {
        // INSERT YOU URL HERE
        String urlStr = "https://script.google.com/macros/s/AKfycbwJsHxwpKXp1qUbyzoLsQOhn1GYXun3jn-rqX9JgVkWmu2un06AcKb7eSNr47f05nMUyA/exec" +
                "?q=" + URLEncoder.encode(text,  "UTF-8") +
                "&target=" + langTo +
                "&source=" + langFrom;
        URL url = new URL(urlStr);
        StringBuilder response = new StringBuilder();
        HttpURLConnection con = (HttpURLConnection) url.openConnection();
        con.setRequestProperty("User-Agent", "Mozilla/5.0");
        BufferedReader in = new BufferedReader(new InputStreamReader(con.getInputStream()));
        String inputLine;
        while ((inputLine = in.readLine()) != null) {
```

```
C:\Users\Owner\.jdks\azul-13.0.6\bin\java.exe ...
Original text: Hello, I am a friendly chat robot. Feel free to chat away!
Translated text: Bonjour, je suis un sympathique robot de chat. N&#39;hésitez pas à discuter!

Process finished with exit code 0
```

Build completed successfully in 3 sec, 791 ms (5 minutes ago)

3 Appendix

End-note: The original error persisted despite multiple attempts to fix it. The exact cause of the error is still unknown even after researching deeply into it. The tutorial for API implementation was followed several times over with the same error result. Uncertain why the google service account refuses to be authenticated.