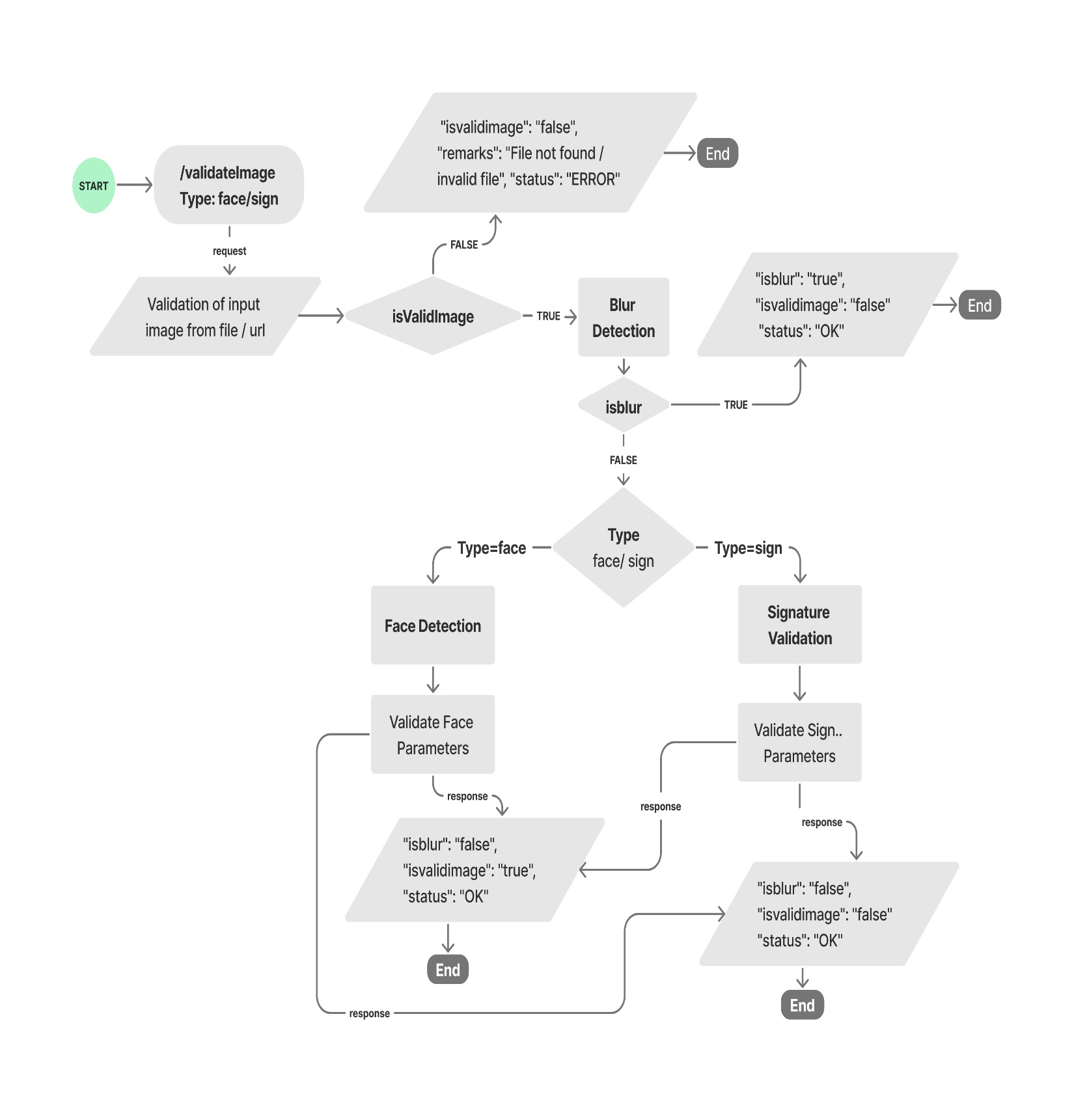
centre for good governance

CGG Image Validation Application

**CGG Image Validation API application setup and usage**

**Problem Statement:** Image validation api implementation for blur detection, face validation, image background verification, signature validation.

**Technical Details**



**Blur Detection:**

A function is said to be a piecewise continuous function if it has a finite number of breaks and it does not blow up to infinity anywhere. Let us assume that the function f(t) is a piecewise continuous function, then f(t) is defined using the Laplace transform. The Laplace transform of a function is represented by L{f(t)} or F(s). Laplace transform helps to solve the differential equations, where it reduces the differential equation into an algebraic problem. It is the integral transform of the given derivative function with real variable t to convert into a complex function with variable s. For t ≥ 0, let f(t) be given and assume the function satisfies certain conditions to be stated later on.

Using open-cv we can calculate Laplace transform as mentioned below.

# Blur detection with OpenCV

cv2.Laplacian(image, cv2.CV\_64F).var()

If the focus measure of the image falls below certain threshold, then image is considered as blurry.



Fig 1. Blurry



Fig 2. Non-Blurry

**Face Detection:**

Face detection is a process of identifying human faces in images or videos. It is a rapidly expanding area of computer vision that offers a variety of useful applications, such as security systems, face identification, and picture analysis. It is a very used part in Deep Learning. We use face detection for different tasks like login on applications, person recognition and different attendance systems. As Deep learning requires a lot of datasets for training a model, so we can use pretrained models for such type of tasks. This module is built using dlib's state-of-the-art face recognition built with deep learning. The model has an accuracy of 99.38%.

# Find all the faces in the image using the default HOG-based model.

face\_locations = face\_recognition.face\_locations(image)

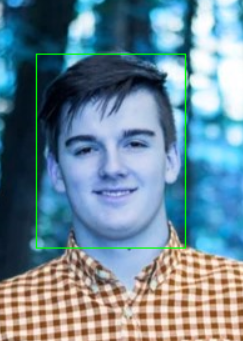


Fig 1. Face Detection

**Face Parameters Validation:**

The photograph should be in the size of 2-inch x 2-inch or (51 mm x 51 mm) and the resolution of the file should be minimum 350 pixels (Width) X 350 pixels (Height) and maximum 1000 pixels (Width) X 1000 pixels

(Height). Bit Depth of image file should be 24 bit and DPI range should be between 200 and 300.

**Reference:** <https://cgifrankfurt.gov.in/public_files/assets/pdf/frankfur10102021.pdf>

**Signature Parameters Validation:**

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The photograph should be in the size of 4 cm x 2 cm or (40 mm x 20 mm) and the resolution of the file should be maximum 900 pixels (Width) X 300 pixels (Height). Bit Depth of image file should be 24 bit and DPI range should be between 200 and 300.

**Project Set-up**

**System Requirements:**

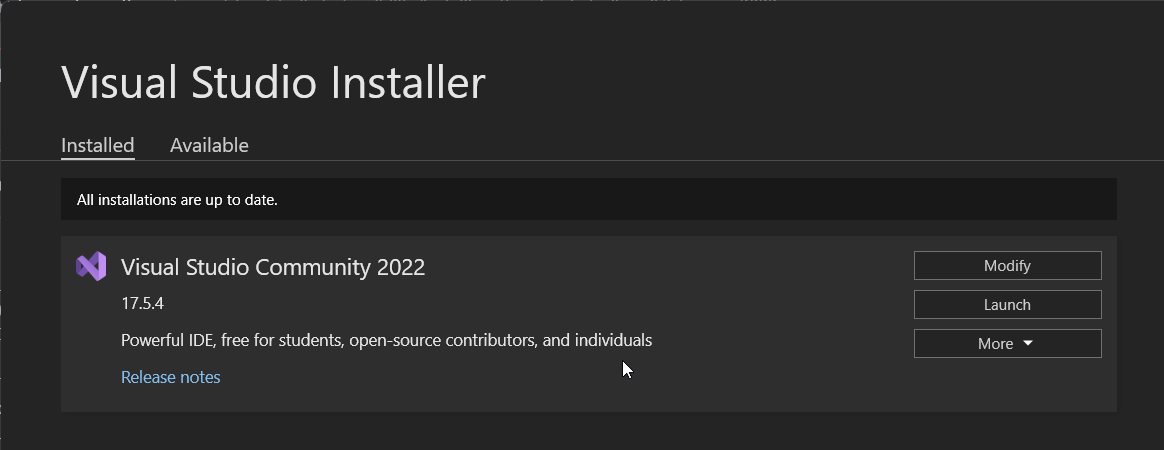
* Windows 64 bit
* Python > 3
* Cmake
* Visual Studio

**Downloads:**

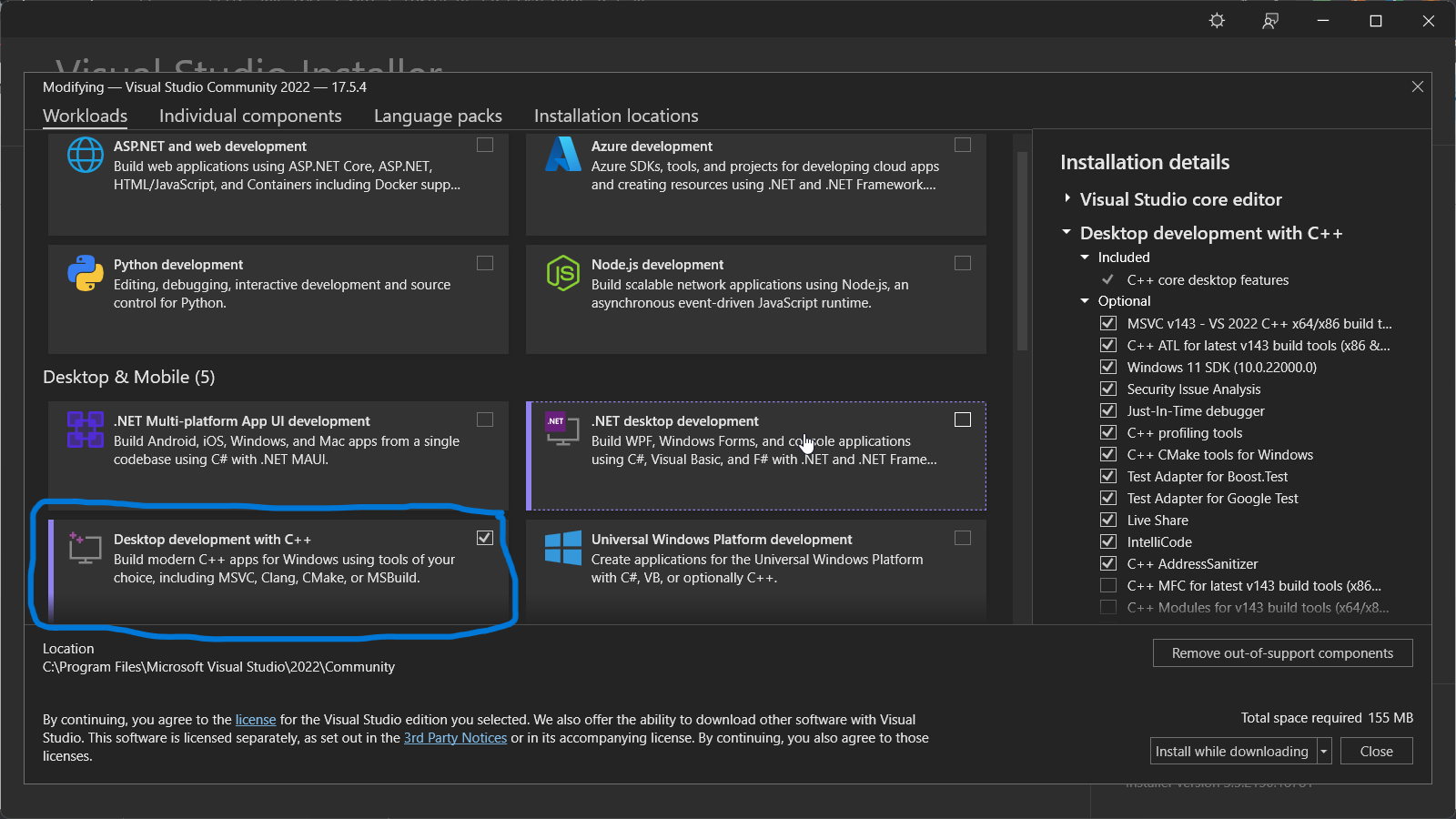
|  |  |
| --- | --- |
| Python | <https://www.python.org/downloads/> |
| CMake | [cmake-3.26.3-windows-x86\_64.msi](https://github.com/Kitware/CMake/releases/download/v3.26.3/cmake-3.26.3-windows-x86_64.msi) |
| Visual Studio | <https://visualstudio.microsoft.com/downloads/> |



* Open visual studio installer and select modify option as shown in below image.



* Select option shown in below screenshot, and install



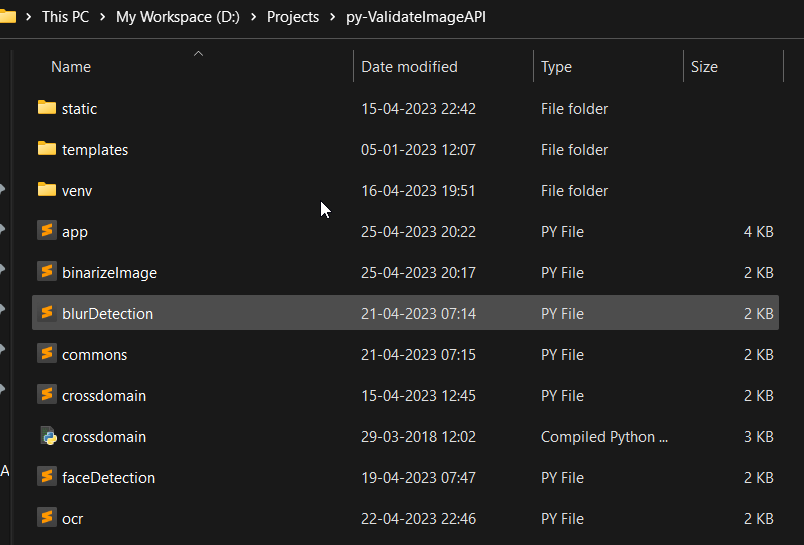
Once above setup is complete install below mentioned python packages using **pip** command line.

Example command: CMD> pip install <package-name>

**Python packages / libraries:**

* flask
* waitress
* requests
* face\_recognition
* cmake
* opencv-python
* pillow
* numpy
* imutils
* scikit-image
* flask-swagger-ui

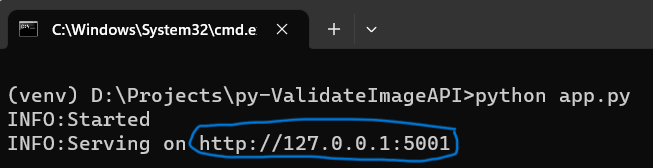
**Project Structure:**



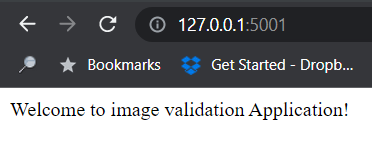
Open command prompt in the project folder and run the below command to start the application.

CMD> **python app.py**

If app start is successful, status becomes **Started.**

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Navigate to the url <http://127.0.0.1:5001>



**API Details**

|  |  |
| --- | --- |
| **Api** | <http://127.0.0.1:5001/validateImage> |
| **Method** | POST |
| **Request Type** | application/json |
| **Response Type** | application/json |
| **Swagger** | <http://127.0.0.1:5001/swagger/> |
| **Log file location** | /<project directory>/static/logs/middleware.log |

**Request Params:**

|  |  |  |
| --- | --- | --- |
| **Param** | **Type** | **Value** |
| **imageFilePath** | String | “D:/detecting\_blur\_result\_006.jpg" or “http://url.com/006.jpg” |
| **id** | String | "TS-2023454" |
| **fileType** | String | face/sign |
| **appid** | String | "TSPSC” |

**Response Params:**

|  |  |  |
| --- | --- | --- |
| **Param** | **Type** | **Value** |
| **appid** | String | TSPSC |
| **createdatetime** | String | 2023-04-25 20:24 |
| **candidate\_id** | String | TS-2023454 |
| **isblur** | String | True / false |
| **isvalidimage** | String | True / false |
| **status** | String | OK / ERROR |
| **image\_type** | String | Face / sign |
| **reference\_id** | String | 0370d2b7-e379-11ed-a2f9-005056c00008 |
| **remarks** | String | * Invalid Image * Valid Image * Full Scan Image * Blur Image * Blur Signature * Invalid Signature * Valid Signature * Full Scan Signature |

**Request Body:**

{

"imageFilePath": "D:/Projects/py-ValidateImageAPI/static/images/006.jpg",

"id": "TS-2023454",

"fileType":"sign",

"appid": "TSPSC"

}

**Response:**

{

"appid": "TSPSC",

"createdatetime": "2023-04-25 20:24",

"candidate\_id": "TS-2023454",

"isblur": "false",

"isvalidimage": "true",

"status": "OK",

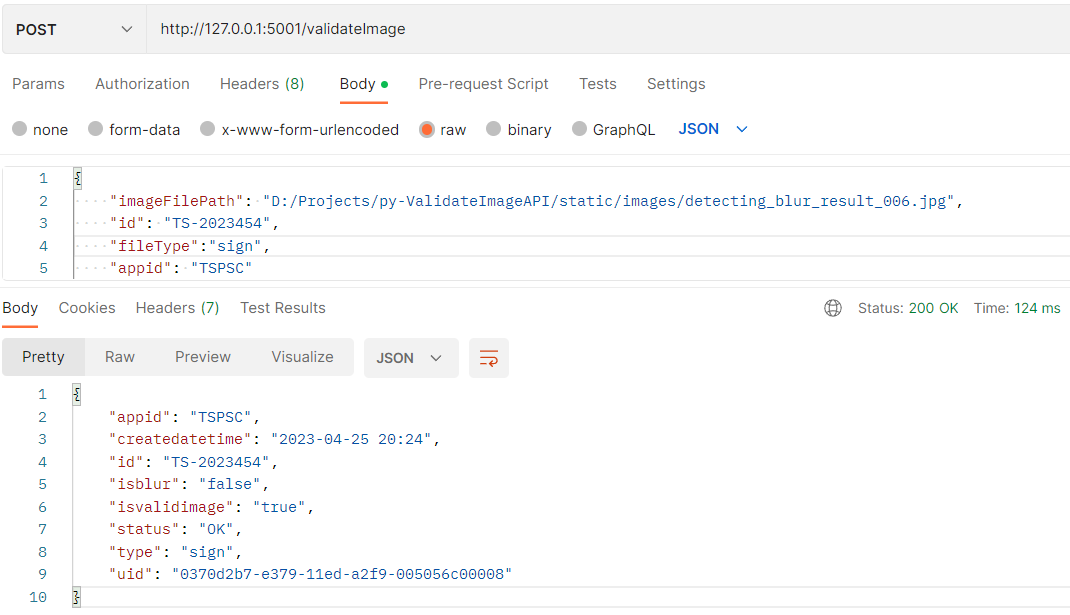
"image\_type": "sign",

"remarks": "Valid Image",

"reference\_id": "0370d2b7-e379-11ed-a2f9-005056c00008"

}

**Sample Postman Request Screenshot**

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**Api Integration Examples**

**JAVA**

1. **okHttp library**

OkHttpClient client = new OkHttpClient().newBuilder().build();

MediaType mediaType = MediaType.parse("application/json");

RequestBody body = RequestBody.create(mediaType, "{\"imageFilePath\": \"D:/Projects/py-ValidateImageAPI/static/images/detecting\_blur\_result\_006.jpg\", \"id\": \"TS-2023454\", \"fileType\":\"sign\", \"appid\": \"TSPSC\"}");

Request request = new Request.Builder() .url("http://127.0.0.1:5001/validateImage") .method("POST", body) .addHeader("Content-Type", "application/json") .build();

Response response = client.newCall(request).execute();

1. **Unirest Library**

Unirest.setTimeouts(0, 0);

HttpResponse<String> response = Unirest.post("http://127.0.0.1:5001/validateImage")

.header("Content-Type", "application/json").body("{ \"imageFilePath\": \"D:/Projects/py-ValidateImageAPI/static/images/detecting\_blur\_result\_006.jpg\",\"id\": \"TS-2023454\", \"fileType\":\"sign\",\"appid\": \"TSPSC\"}").asString();

**Java Script**

var myHeaders **=** **new** Headers();

myHeaders.**append**("Content-Type", "application/json");

var raw **=** JSON.**stringify**({

"imageFilePath": "D:/Projects/py-ValidateImageAPI/static/images/detecting\_blur\_result\_006.jpg",

"id": "TS-2023454",

"fileType": "sign",

"appid": "TSPSC"

});

var requestOptions **=** {

method: 'POST',

headers: myHeaders,

body: raw,

redirect: 'follow'

};

fetch("http://127.0.0.1:5001/validateImage", requestOptions)

.**then**(response **=>** response.text())

.**then**(result **=>** console.**log**(result))

.**catch**(error **=>** console.**log**('error', error));

**JQuery**

var settings **=** { "url": "http://127.0.0.1:5001/validateImage",

"method": "POST", "headers": {

"Content-Type": "application/json"

}, "data": JSON.**stringify**({

"imageFilePath": "D:/Projects/py-ValidateImageAPI/static/images/detecting\_blur\_result\_006.jpg",

"id": "TS-2023454", "fileType": "sign",

"appid": "TSPSC"

}),

};

$.ajax(settings).done(**function** (response) {

console.**log**(response);

});

**Python**

import requests

import json

url = "http://127.0.0.1:5001/validateImage"

payload = json.dumps({ "imageFilePath": "D:/Projects/py-ValidateImageAPI/static/images/detecting\_blur\_result\_006.jpg",

"id": "TS-2023454",

"fileType": "sign",

"appid": "TSPSC"

})

headers = {

'Content-Type': 'application/json'

}

response = requests.request("POST", url, headers=headers, data=payload)

print(response.text)