IMAGE RECOGNITION

[CAD_PHASE-4]

FACE EMOTION DETECTION:

Image Recognition with IBM Cloud Visual Recognition

PROBLEM STATEMENT:

1. Image processing can be broadly defined as the manipulation of signals which are inherently multidimensional.

2. The most common such signals are photographs and video sequences.

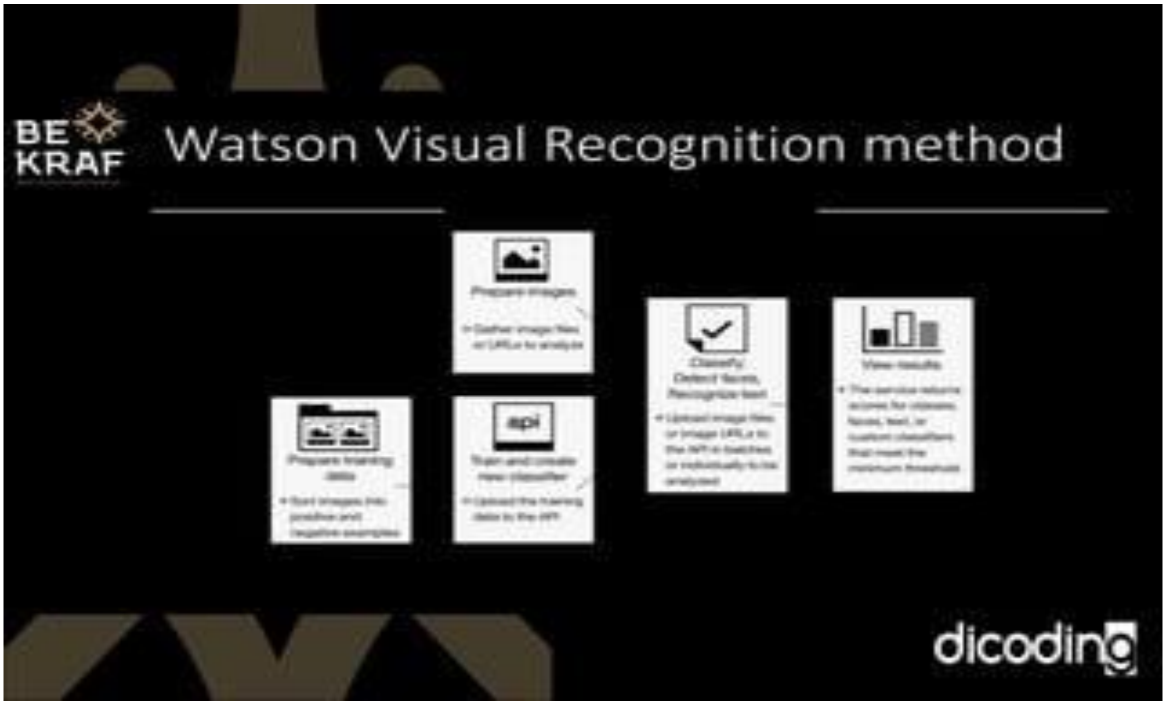
3. The goals of processing or manipulation can be (i) compression for storage or transmission; (ii) enhancement or restoration; (ili) analysis, recognition, and understanding; or (iv) visualization for human observers.

PROBLEM DEFINITION:

1. The project involves creating an image recognition system using IBM Cloud Visual Recognition.

2. The goal is to develop a platform where users can upload images, and the system accurately classifies and describes the image contents.

3. This will enable users to craft engaging visual stories with the help of Al-generated captivating visuals and compelling narratives.



Watson Visual Recognition method

Prepare images
- Gather image files or URLs to analyze

Prepare training data
- Sort images into positive and negative examples

Train and create new classifier
- Upload the training data to the API

Classify, Detect faces, Recognize text
- Upload image files or image URLs to the API in batches or individually to be analyzed

View results
- The service returns scores for classes, faces, text, or custom classifiers that meet the minimum threshold

I can provide you with a high-level outline of how you can integrate IBM Cloud Visual Recognition and AI-generated captions into an image recognition system:

1. setup IBM Cloud Visual Recognition:

- Sign up for an IBM Cloud account if you don't have one.
- Create a new Visual Recognition service instance.
- Obtain your API key and endpoint URL.

2.Collect and Preprocess Images:

- Gather a dataset of images you want to recognize and caption.
- Preprocess the images, if necessary, to ensure they are suitable for analysis.

3. Integrate Visual Recognition:

- Use the IBM Watson Visual Recognition API to upload images and perform image classification.

- Implement the necessary code to send requests to the API using your API key and endpoint.

4. Receive Classification Results:

- Process the classification results returned by the Visual Recognition API, which typically include a list of recognized classes or objects in the image.

5. Natural Language Generation:

- To generate captions for recognized images, you can use a Natural Language Processing (NLP) library or model. Options include OpenAI's GPT-3, Google's BERT, or similar models.

- Send the descriptions of recognized objects or classes from step 4 to the NLP model to generate captions.

6.Combine result:

- Combine the image classification results from IBM Visual Recognition with the generated captions.

7.User interface:

- Create a user interface or application where users can upload images, initiate the recognition process, and view the resulting captions.

8. Testing and Evaluation:

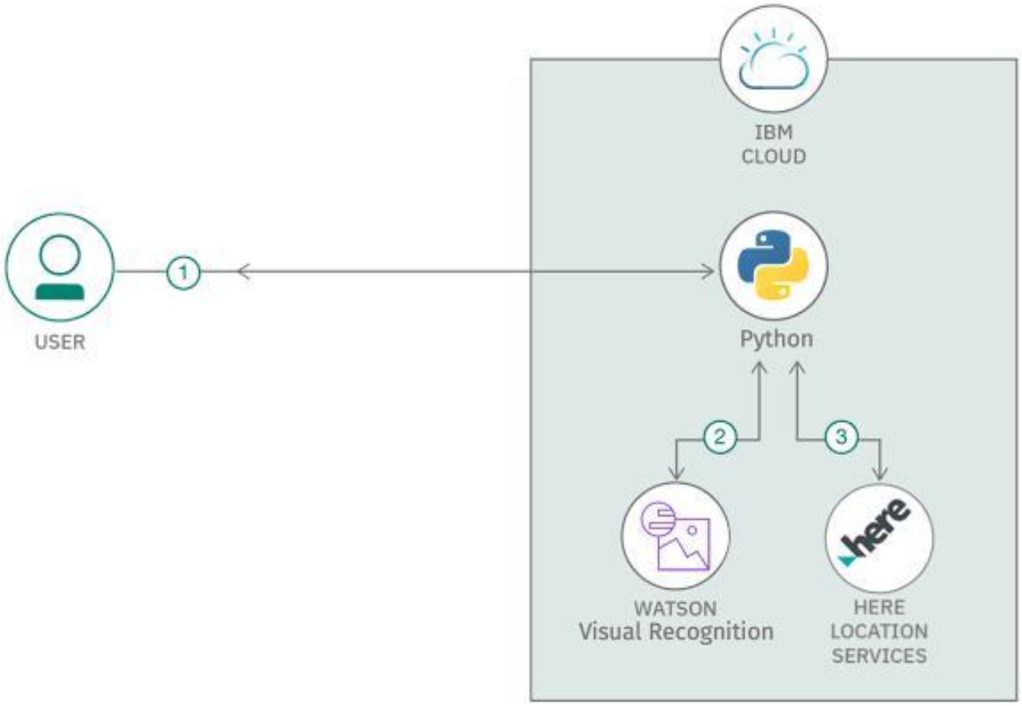
- Thoroughly test your system to ensure it correctly classifies images and generates meaningful captions.
- Collect user feedback and make improvements as needed.

9. Deployment:

- Deploy your integrated system, either as a web application, mobile app, or as part of a larger system.

10. Maintenance and Updates:

- Regularly update the system with new models or algorithms for improved recognition and captions.
- Keep track of updates to the IBM Visual Recognition API and adapt your integration accordingly.



To create a Python program for emotional classification using IBM Cloud, you can leverage IBM Watson's Natural Language Understanding service. Here are the steps to get you started:

1. Set Up IBM Cloud Account:

If you don't have an IBM Cloud account, you'll need to sign up for one.

2. Create an NLU Service:

Once you have an IBM Cloud account, create a Natural Language Understanding (NLU) service instance.

3. Obtain API Credentials:

After creating the NLU service, you'll need to obtain the API credentials (API Key and URL).

4. Install the IBM Watson SDK:

Install the IBM Watson SDK for Python using pip:

```
pip install ibm-watson
```

5. Python Code for Emotional Classification:

Here's a simple Python script to classify emotions in a text using the IBM Watson NLU service:

Python code:

```
from ibm_watson import NaturalLanguageUnderstandingV1

from ibm_watson.natural_language_understanding_v1 import Features, EmotionOptions

from ibm_cloud_sdk_core.authenticators import IAMAuthenticator


# Set up the credentials

api_key = "YOUR_API_KEY"

service_url = "YOUR_SERVICE_URL"


authenticator = IAMAuthenticator(api_key)
```

```
nlu = NaturalLanguageUnderstandingV1(
    version='2019-07-12',
    authenticator=authenticator
)
nlu.set_service_url(service_url)

# Text you want to classify emotions for
text = "I am feeling happy and excited today!"

# Analyze the emotion
response = nlu.analyze(
    text=text,
    features=Features(emotion=EmotionOptions())
).get_result()

# Extract and print emotions
emotions = response['emotion']['document']['emotion']
print("Emotions:", emotions)
```

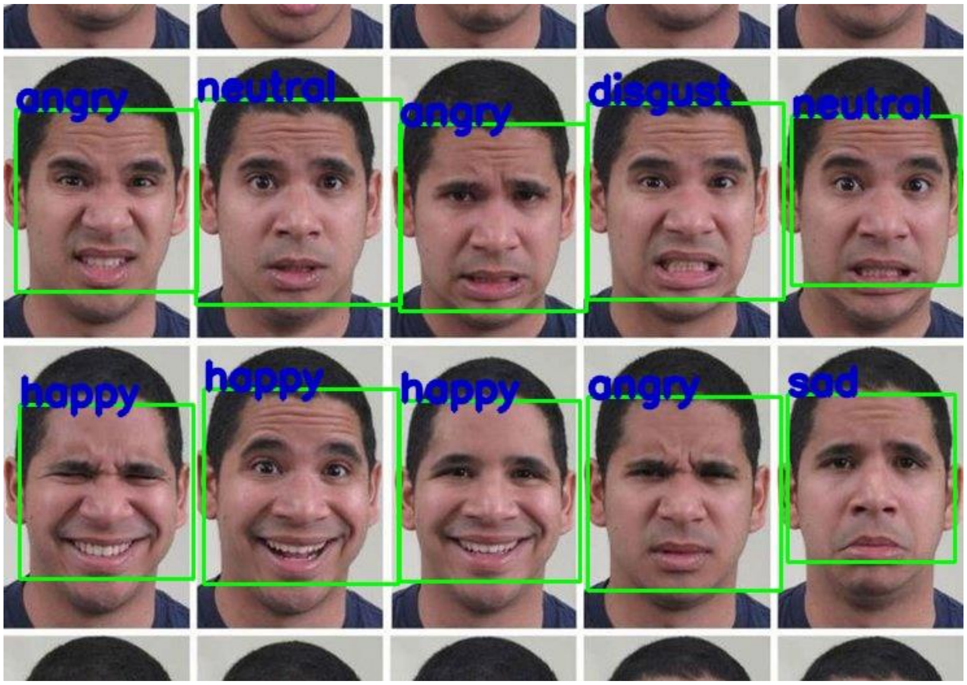
Input Image:

6. Run the Python Script:

Execute the Python script, and it will analyze the emotions in the provided text.

Output:

Emotions:



CONCLUSION:

Thus the part2 of development of Image recognition on IBM cloud visual recognition is done.