

# ***Deloitte TechnoUtsav 3.0***

## ***Execution Guide***

### ***IIT Bhilai\_404 ERROR***

#### **Credentials**

IBMId: [kayamn@iitbhilai.ac.in](mailto:kayamn@iitbhilai.ac.in)

Password: [Qwerty1234](#)

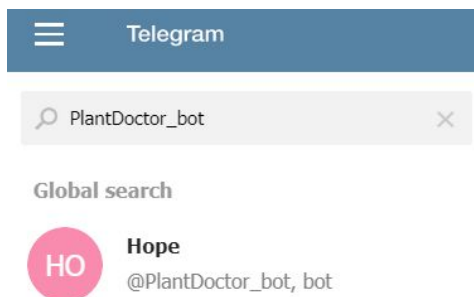
Node-red Username: [kayamn](#)

Password: [1!2@3#4\\$5%6^7&8\\*9\(q\)](#)

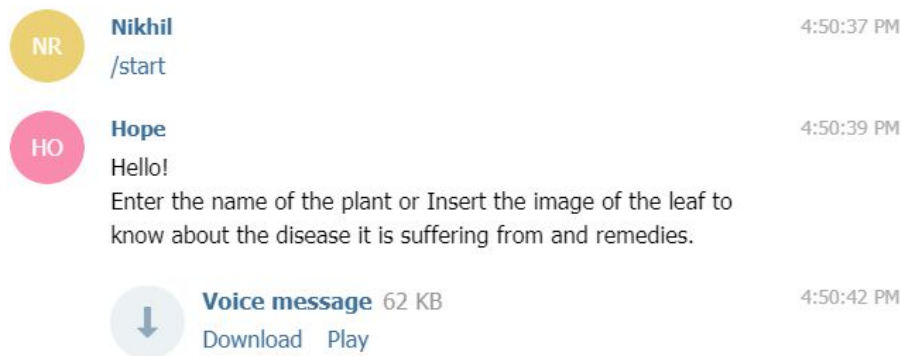
- ***Method 1(Using Visual Recognition model) is user friendly and can be used by the public.***
- ***Test data is provided in the data assets section in the Watson Studio projects. The test data images which are of 256\* 256 dimension images can be used for testing. (Model works well if the input test images are 256\*256 images, as the model is trained with 256\*256 dimension images while training.)***
- ***There are 63 test images in the provided test data with the naming format Image\_1 to Image\_63.***
- ***Executed Test cases and Results for Method 1(Using Visual Recognition model) are provided in the “Plant Disease Detection using Visual Recognition Model” project in IBM Cloud. (In .xlsx format.)***
- ***Executed Test cases and Results for Method 2(Using Jupyter notebook model) are provided in the “Plant Disease Detection using Jupyter Notebook” project in IBM Cloud. (In .xlsx format.)***


## ***Method 1: Using Visual Recognition Model.***

- Now login/create an account in telegram.
- In chats, search for PlantDoctor\_bot and open it.  
(Name : Hope, Username : PlantDoctor\_bot)




- Then click on the start button. Now you will get both text and voice messages asking to enter the name of the plant or crop or insert the image of the leaf to know about the disease it is suffering from and remedies.




- Tap on the “Attach” icon . (It’s on the right-down corner.) Choose the photo that you want to send from the gallery or use the camera to take a picture of the leaf. And send it. (In my case we used the test data which is


provided in data assets of “Plant Disease Detection using Visual Recognition Model” project in Watson Studio.)


- Now, you will get both text and voice messages containing the disease name due to which the crop is suffering and symptoms, cause, and management (remedies) so that by following those steps in management you can reduce the crop loss.

**Hope bot** 

**Nikhil**

4:58:50 PM



**Hope**

4:58:57 PM

Leaf: Tomato leaf


Disease: Tomato Yellow leaf Curl virus

**SYMPTOMS:**  
The infected leaves become reduced in size, curl upward, appear crumpled and show yellowing of veins and leaf margins. The whole plant stand erect with only upright growth. The flowers may not develop and drop off.

**CAUSE:**  
Virus

**MANAGEMENT:**  
Use a neonicotinoid insecticide, such as dinotefuran (Venom) imidacloprid (AdmirePro, Alias, Nuprid, Widow, and others) or thiamethoxam (Platinum), as a soil application or through the drip irrigation system at transplanting of tomatoes. Prevent the spread of any white flies to healthy plants.

You can try again with other images or other plant names to know about their diseases.



**Voice message** • 390 KB

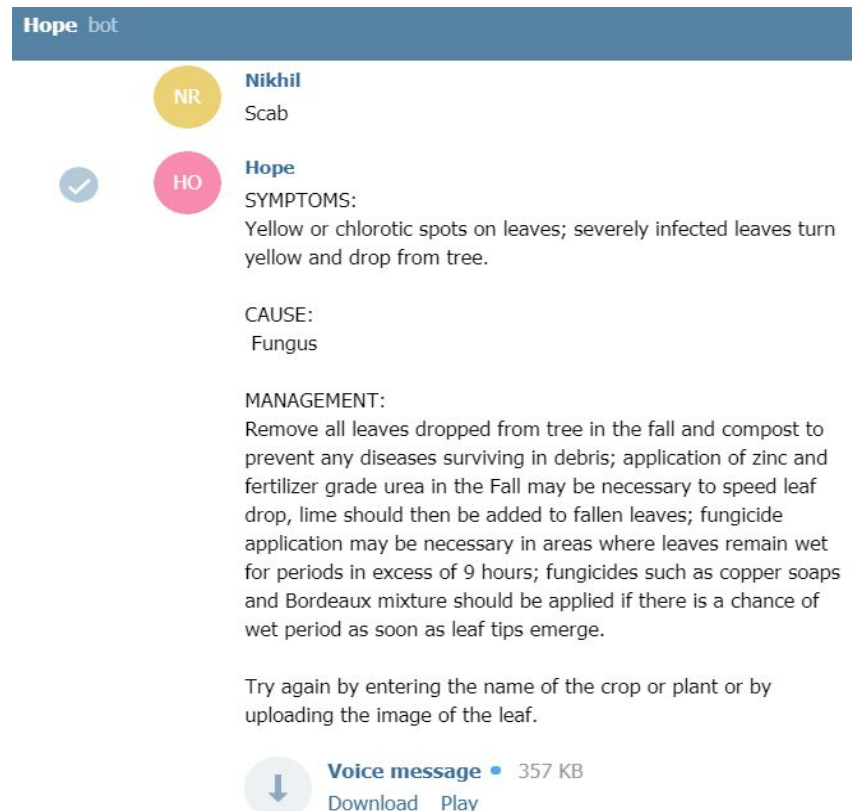
4:58:59 PM

[Download](#) [Play](#)

- In case, you already know the plant disease but want to know the cause and remedies you can follow the steps to get the remedies :
  - Users can ask telegram bot in 5 different languages(Arabic, English, French, Japanese, Spanish).
  - Send the name of the plant which you know. (You can send either text message or voice message but the voice message should be very clear. If it is unclear, the bot may not be able to understand the phrase and you will get a reply asking to rephrase properly.)
  - Now, the bot asks for the name of the disease(both text and voice messages).



- Send the name of the disease. (either text or voice message.)  
Now, you will get both text and voice messages containing the Symptoms, Cause, Management so that by following those steps in management you can reduce the crop loss.



- You can repeat the same process for the different images and different plant diseases as well.
- In case the bot didn't understand your message, it asks again to enter the "correct plant name" or "correct disease name associated with the entered plant name".

## ***Method 2: Using Jupyter Notebook.***

- Log in to the IBM Cloud with the credentials given at the starting of this guide at :

<https://cloud.ibm.com/login>.

- Go to Resource List and in Services click on **CropAI(Watson Studio)** and then click on Get Started. And in the Recently updated projects section, open **“Plant Disease Detection using Jupyter Notebook”** Project.
- Once you open this project you can see the **“Importing model”** Jupyter notebook in the Notebooks section. Open it.
- We used a dataset that contains 14 plants and 26 diseases and 12 healthy to train our model. So, this model works for those plants and diseases. (Apple, Blueberry, Cherry, Corn, Grape, Orange, Peach, Pepper bell, Potato, Raspberry, Soybean, Squash, Strawberry, Tomato.)
- In this notebook, the model.zip is added, converted into a cloud object, downloaded, then the model is extracted from it and loaded into the notebook in the first 6 cells.
- Now by following the below process, you will be able to give input to the loaded model in this notebook. (Without downloading the data asset into jupyter notebook, you cannot utilize or access it.)
  - Go to the Files Tab and upload an image .JPG format data file. (In my case we have already uploaded the test data.)
  - For any input image file in Files Tab, you can see the option named “Insert the code”. Click on it.

- Then click on any input cell of a notebook and select the **“Credentials”** option after clicking on the “Insert the code”. Then you will see the code inserted into the cell.

Input cell will be like this:

```
In [19]:
# @hidden_cell
# The following code contains the credentials for a file in your IBM Cloud Object Storage.
# You might want to remove those credentials before you share your notebook.
credentials_3 = {
    'IAM_SERVICE_ID': 'iam-ServiceId-4c340d96-f3f5-4771-9373-231a2b6db460',
    'IBM_API_KEY_ID': 'TBxY7x75Naw8Q8sYwdUrKBYdJfEY6qfZtt5oymf3zrJJ',
    'ENDPOINT': 'https://s3.eu-geo.objectstorage.service.networklayer.com',
    'IBM_AUTH_ENDPOINT': 'https://iam.cloud.ibm.com/oidc/token',
    'BUCKET': 'plantdiseasedetection1-donotdelete-pr-hwzzkphrt7vmmxq',
    'FILE': 'PotatoHealthy1.JPG'
}
```

Insert to code ▾

PotatoHealthy1.JPG

Insert to code ^

StreamingBody object

Credentials

- Copy the file name associated with **“FILE”** in Credentials. (In this case copy “PotatoHealthy1.JPG”)
- The piece of code shown below is used to make a cloud object of an uploaded file. (Make sure that credentials\_x in the above screenshot should match with credentials\_x in the below screenshot. Here it is credentials\_3 and cos\_3.)

```
In [20]: from ibm_botocore.client import Config
import ibm_boto3

cos_3 = ibm_boto3.client(service_name = 's3',
    ibm_api_key_id = credentials_3['IBM_API_KEY_ID'],
    ibm_service_instance_id = credentials_3['IAM_SERVICE_ID'],
    ibm_auth_endpoint = credentials_3['IBM_AUTH_ENDPOINT'],
    config = Config(signature_version = 'oauth'),
    endpoint_url = credentials_3['ENDPOINT'])
```

- Once you have instantiated an object, now we have to download the uploaded assets in your working notebook using the below code. (Make sure that credentials\_x and cos\_x in the above screenshot should match with credentials\_x and cos\_x in the below screenshot too. Here it is credentials\_3 and cos\_3.)

```
cos_3.download_file(Bucket = credentials_3['BUCKET'],Key = 'PotatoHealthy1.JPG' ,Filename = 'PotatoHealthy1.JPG')
```

- Now you can input the image file to the loaded model for output.

```
from googletrans import Translator
imar = convert_image_to_array('PotatoHealthy1.JPG')
np_image_list = np.array([imar], dtype=np.float16) / 225.0
arr = model.predict_classes(np_image_list)
a = Classes[arr[0]]
translator = Translator()
result = translator.translate(a,src='en',dest=input())
print(result.text)
```

- After running the above cell you will see an input box where you have to input the language so that the output will be given in that language. For now, this language selection feature works only for 5 languages. ('arabic' : 'ar' , 'english' : 'en' , 'french' : 'fr' , 'japanese' : 'ja' , 'spanish' : 'es')
- This is the final output : (Here I have given fr(french) as my input language so the output is “Saine pomme de Terre” meaning “Healthy Potato”).

```
from googletrans import Translator
imar = convert_image_to_array('PotatoHealthy1.JPG')
np_image_list = np.array([imar], dtype=np.float16) / 225.0
arr = model.predict_classes(np_image_list)
a = Classes[arr[0]]
translator = Translator()
result = translator.translate(a,src='en',dest=input())
print(result.text)
```

fr  
Saine pomme de terre



- Now login/create an account in telegram.
- In chats, search for PlantDoctor\_bot and open it.  
(Name : Hope, Username : PlantDoctor\_bot)
- Then click on the start button. Now you will get both text and voice messages asking to enter the name of the plant or crop or insert the image of the leaf to know about the disease it is suffering from and remedies.
- Send the name of the plant which is in the output of the model. (You can send either text message or voice message but the voice message should be very clear. If it is unclear, the bot may not be able to understand the phrase and you will get a reply asking to rephrase properly.)
- Now, the bot asks for the name of the disease(both text and voice messages).
- Send the name of the disease which is in the output of the model. (either text or voice message.)
- Now, you will get both text and voice messages containing the Symptoms, Cause, Management so that by following those steps in management you can reduce the crop loss.
- You can repeat the same process for the different images as well.
- In case, the bot didn't understand your message it asks again to enter the "correct plant name" or "correct disease name associated with the entered plant name".
- Users can use any method to get the disease name and can use our telegram bot to get the remedies.