Water Logging Project

Data Collection :

Data has been collected by **simple image download** library. It downloads images from google based on the search parameter you pass. I searched **"water logging in school"** for water logging images and **"Indian government school campus"** for without water logging images. I collected a total of 50 images for each category. Then I split these image into train and test,

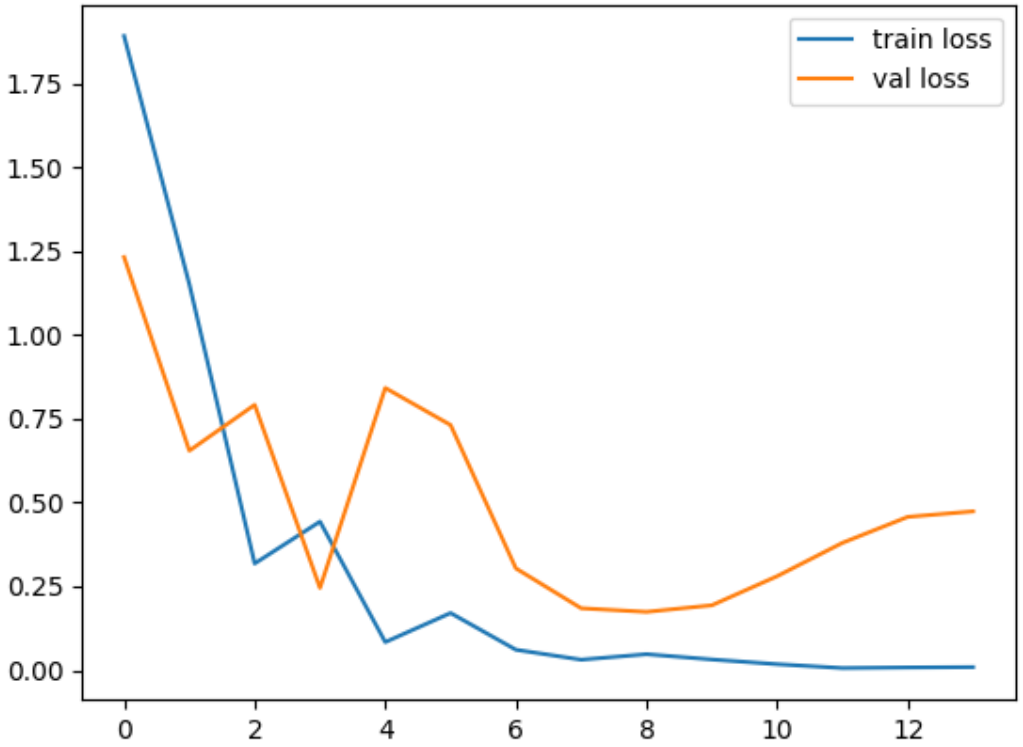
Train -> Logging image ->45 images
Train -> Not Logging Images -> 44 images
Test -> Logging images ->5 Images
Test -> Not Logging Images-> 5 Images
Link for the Dataset :
https://drive.google.com/file/d/1JafoAGXutDdRqSisxYRS6-f3I574U2dz/view?usp=sharing

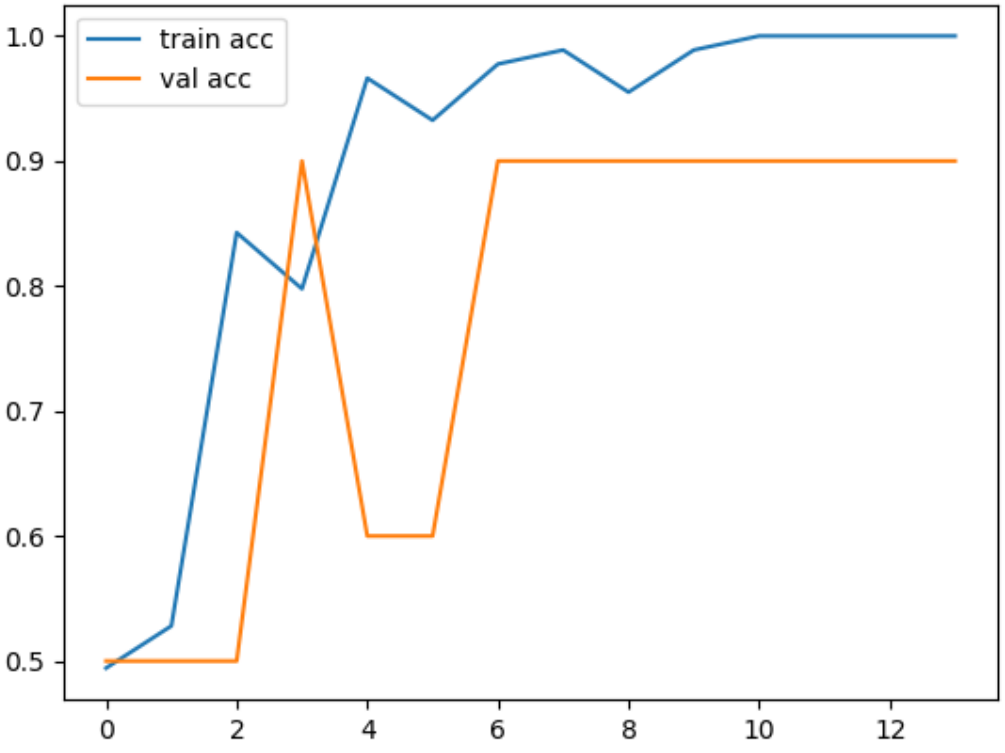
Data Loader: I used keras flow from directory to load the data where I resize each image **224*224** shape also takes the batch size as **32** and normalises the images.

Model Architecture : I used transfer learning for my model where I used a **VGG19** model with weights as **Imagenet** and including **top** layer. I freeze all the weights of the VGG16 model then I **flatten** the output layer and add a **dense layer** with 2 neurons and with **sigmoid activation** function. To build this architecture I use the Tensorflow framework.
So my model takes input as 224*224*3 gives output with 2 values.
My model architecture looks like this.
VGG19 --> Flatten → Dense(2, sigmoid)

Model Training: For training the model I used **sparse categorical crossentropy** as loss function, **Adam** as optimizer and **Accuracy** as metrics **batch size** as 32 and with **early stopping** where I used validation loss.
I trained my model for 30 **epochs**.

Model Training Results: After training the Model for 14 epochs due to early stopping I got:
Training Accuracy : 100%
Training Loss : 0.0094
Validation Accuracy : 90%
Validation Loss : 0.4737


train loss
val loss
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0
2
4
6
8
10
12


train acc
val acc
1.0
0.9
0.8
0.7
0.6
0.5
0
2
4
6
8
10
12

Library and Framework used :

Tensorflow
Keras
Numpy
CV2
Matplotlib

Github link of the Project :
https://github.com/subhash9758964966/water_logging_project/tree/main

Link of colab(Tensorflow) :
https://colab.research.google.com/drive/1bagBaul1LwplsSBSedTd0_4YO-kDikHv?usp=sharing

I also done this project in Pytorch as but results are different there:
Link for colab(pytorch):
https://colab.research.google.com/drive/1NO_T3UXpsE8KHoaBmlqTnAPrw1AQlOU7?usp=sharing