In [2]:

```
import os
import PIL
import cv2
import glob
import numpy as np
from tkinter import *
from PIL import Image, ImageDraw, ImageGrab
```

In [4]:

```
from keras.models import load_model
model = load_model('mnist.h5')
print("Model loaded successfully")
```

```
Model loaded successfully
```

In [3]:

```
import tkinter as tk
import numpy as np
import cv2

#pip install pillow
from PIL import ImageTk,Image,ImageDraw

from keras.models import Sequential
from keras.layers import Dense,Flatten

model=Sequential()

model.add(Flatten(input_shape=(28,28)))

model.add(Dense(512,activation='relu'))
model.add(Dense(256,activation='relu'))
model.add(Dense(128,activation='relu'))
model.add(Dense(64,activation='relu'))
model.add(Dense(10,activation='softmax'))

model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])

model.load_weights('C:\Users\HP\mnist.h5')

def event_function(event):

    x=event.x
    y=event.y

    x1=x-30
    y1=y-30

    x2=x+30
    y2=y+30

    canvas.create_oval((x1,y1,x2,y2),fill='black')
    img_draw.ellipse((x1,y1,x2,y2),fill='white')

def save():

    global count

    img_array=np.array(img)
    img_array=cv2.resize(img_array,(28,28))

    cv2.imwrite(str(count)+'.jpg',img_array)
    count=count+1

def clear():

    global img,img_draw

    canvas.delete('all')
    img=Image.new('RGB',(500,500),(0,0,0))
    img_draw=ImageDraw.Draw(img)

    label_status.config(text='PREDICTED DIGIT: NONE')

def predict():
```

```
    img_array=np.array(img)
    img_array=cv2.cvtColor(img_array,cv2.COLOR_BGR2GRAY)
    img_array=cv2.resize(img_array,(28,28))

    img_array=img_array/255.0
    img_array=img_array.reshape(1,28,28)
    result=model.predict(img_array)
    label=np.argmax(result,axis=1)

    label_status.config(text='PREDICTED DIGIT:'+str(label))

count=0

win=tk.Tk()

canvas=tk.Canvas(win,width=500,height=500,bg='white')
canvas.grid(row=0,column=0,columnspan=4)

#button_save=tk.Button(win,text='SAVE',bg='green',fg='white',font='Helvetica 20 bold',comma
#button_save.grid(row=1,column=0)

button_predict=tk.Button(win,text='PREDICT',bg='blue',fg='white',font='Helvetica 20 bold',c
button_predict.grid(row=1,column=1)

button_clear=tk.Button(win,text='CLEAR',bg='yellow',fg='white',font='Helvetica 20 bold',com
button_clear.grid(row=1,column=2)

#button_exit=tk.Button(win,text='EXIT',bg='red',fg='white',font='Helvetica 20 bold',command
#button_exit.grid(row=1,column=3)

label_status=tk.Label(win,text='PREDICTED DIGIT: NONE',bg='white',font='Helvetica 24 bold')
label_status.grid(row=2,column=0,columnspan=4)

canvas.bind('<B1-Motion>',event_function)
img=Image.new('RGB',(500,500),(0,0,0))
img_draw=ImageDraw.Draw(img)

win.mainloop()
```

```
1/1 [==============================] - 2s 2s/step
1/1 [==============================] - 0s 98ms/step
1/1 [==============================] - 0s 91ms/step
1/1 [==============================] - 0s 85ms/step
1/1 [==============================] - 0s 113ms/step
1/1 [==============================] - 0s 159ms/step
1/1 [==============================] - 0s 102ms/step
1/1 [==============================] - 0s 74ms/step
1/1 [==============================] - 0s 55ms/step
1/1 [==============================] - 0s 72ms/step
1/1 [==============================] - 0s 72ms/step
1/1 [==============================] - 0s 91ms/step
1/1 [==============================] - 0s 136ms/step
1/1 [==============================] - 0s 159ms/step
```