ITSOURCECODE

Handwritten Digit Recognition In Python With Source Code

June 2, 2021 by angel jude suarez

Handwritten Digit Recognition In Python With Source Code

The **Handwritten Digit Recognition In Python** was developed using **Python Deep Learning**, This we are going to implement a handwritten digit recognition app using the MNIST dataset. We will be using a special type of deep neural network that is **Convolutional Neural Networks**. In the end, we are going to build a GUI in which you can draw the digit and recognize it straight away.

A **Handwritten Digit Recognition** s the ability of computers to recognize human handwritten digits. It is a hard task for the machine because handwritten digits are not perfect and can be made with many different flavors. The handwritten digit recognition is the solution to this problem which uses the image of a digit and recognizes the digit present in the image.

In this Python Project it also includes a downloadable Project With Source Code for free, just find the downloadable source code below and click to start downloading.

By the way, if you are new to python programming and you don't know what would be the Python IDE to use, I have here a list of the Best Python IDE for Windows, Linux, Mac OS that will suit you. I also have here How to Download and Install the Latest Version of Python on Windows.

To start executing **Handwritten Digit Recognition In Python With Source Code**, make sure that you have installed **Python** 3.9 and **PyCharm** on your computer.

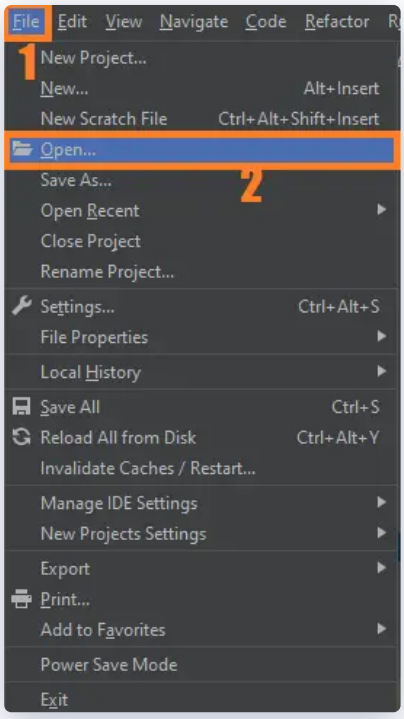
Handwritten Digit Recognition In Python With Source Code : Steps on how to run the project.

Time needed: 5 minutes

These are the steps on how to run **Handwritten Digit Recognition In Python With Source Code**

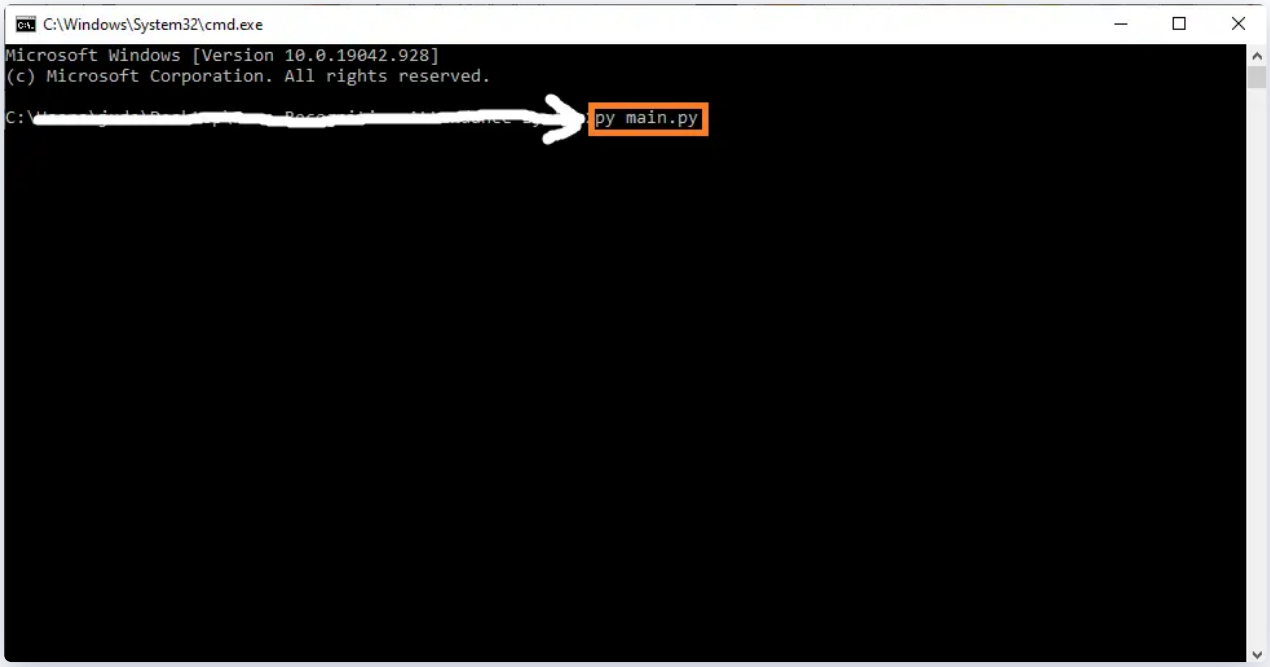
- **Step 1: Download the given source code below.**
  First, download the given source code below and unzip the source code.

- **Step 2: Import the project to your PyCharm IDE.**
  Next, import the source code you've download to your PyCharm IDE.



- **Step 3: Run the project.**

last, run the project with the command “***py main.py***”



Installed Libraries

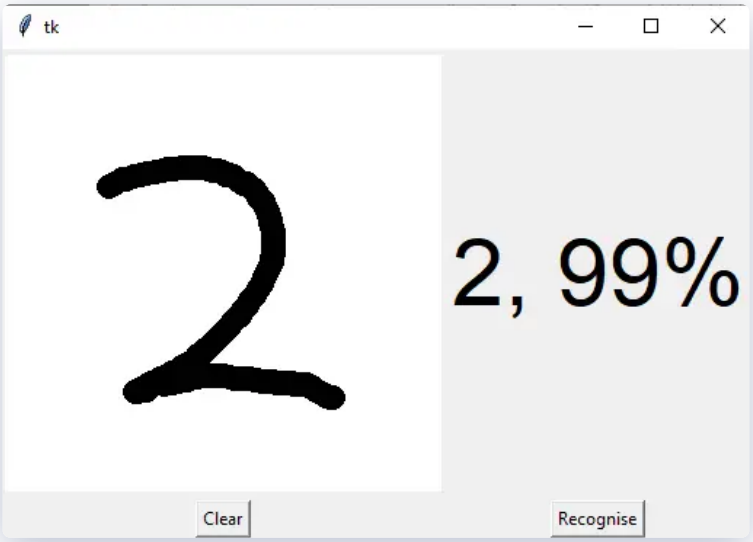
```
from keras.models import load_model
from tkinter import *
import tkinter as tk
import win32gui
from PIL import ImageGrab, Image
import numpy as np
```

Complete Source Code

```
from keras.models import load_model
from tkinter import *
import tkinter as tk
import win32gui
from PIL import ImageGrab, Image
import numpy as np

model = load_model('mnist.h5')

def predict_digit(img):
    #resize image to 28x28 pixels
    img = img.resize((28,28))
    #convert rgb to grayscale
    img = img.convert('L')
    img = np.array(img)
    #reshaping to support our model input and normalizing
    img = img.reshape(1,28,28,1)
    img = img/255.0
    #predicting the class
    res = model.predict([img])[0]
    return np.argmax(res), max(res)

class App(tk.Tk):
    def __init__(self):
        tk.Tk.__init__(self)
```

```
        self.x = self.y = 0

        # Creating elements
        self.canvas = tk.Canvas(self, width=300, height=300, bg = "white", cursor="cross")
        self.label = tk.Label(self, text="Draw..", font=("Helvetica", 48))
        self.classify_btn = tk.Button(self, text = "Recognise", command = self.classify_handwriting)
        self.button_clear = tk.Button(self, text = "Clear", command = self.clear_all)

        # Grid structure
        self.canvas.grid(row=0, column=0, pady=2, sticky=W, )
        self.label.grid(row=0, column=1,pady=2, padx=2)
        self.classify_btn.grid(row=1, column=1, pady=2, padx=2)
        self.button_clear.grid(row=1, column=0, pady=2)

        #self.canvas.bind("<Motion>", self.start_pos)
        self.canvas.bind("<B1-Motion>", self.draw_lines)

    def clear_all(self):
        self.canvas.delete("all")

    def classify_handwriting(self):
        HWND = self.canvas.winfo_id()  # get the handle of the canvas
        rect = win32gui.GetWindowRect(HWND)  # get the coordinate of the canvas
        a,b,c,d = rect
        rect=(a+4,b+4,c-4,d-4)
        im = ImageGrab.grab(rect)

        digit, acc = predict_digit(im)
        self.label.configure(text= str(digit)+', '+ str(int(acc*100))+'%')

    def draw_lines(self, event):
        self.x = event.x
        self.y = event.y
        r=8
        self.canvas.create_oval(self.x-r, self.y-r, self.x + r, self.y + r, fill='black')

app = App()
mainloop()
```

Output



Download Source Code below

DOWNLOAD

Summary

In this article, we have successfully built a Python deep learning project on handwritten digit recognition app. We have built and trained the Convolutional neural network which is very effective for image classification purposes. Later on, we build the GUI where we draw a digit on the canvas then we classify the digit and show the results.

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Inquiries

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2 thoughts on “Handwritten Digit Recognition In Python With Source Code”

Akshada Uttam Baad
July 13, 2021 at 1:01 pm

This handwriting digit recognition is under the machine learning or not? If yes then how?

Log in to Reply

Matias

May 3, 2023 at 10:31 am

Why always the model predict the same digit? It is how the model does not trained at all or it is stacked. Can you help me please?

Log in to Reply

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