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        "from keras.layers.convolutional import Conv2D\n",
        "from keras.models import Sequential\n",
        "from tensorflow.keras.utils import to_categorical\n",
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    "print (\\"Shape of y_test: {}".format(y_test.shape))"
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"print (\"Shape of X_test: {}\".format(X_test.shape))\n",
"print (\"Shape of y_test: {}\".format(y_test.shape))"
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        "layer_2 = MaxPooling2D(pool_size=2)\n",
        "layer_3 = Conv2D(32, kernel_size=3, activation='relu')\n",
        "layer_4 = MaxPooling2D(pool_size=2)\n",
        "layer_5 = Dropout(0.5)\n",
        "layer_6 = Flatten()\n",
        "layer_7 = Dense(128, activation='relu')\n",
        "layer_8 = Dropout(0.5)\n",
        "layer_9 = Dense(10, activation='softmax')\n",
        "\n",
        "## Add the layers to the model\n",
        "model.add(layer_1)\n",
        "model.add(layer_2)\n",
        "model.add(layer_3)\n",
        "model.add(layer_4)\n",
        "model.add(layer_5)

```

```

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        "model.add(layer_8)\n",
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    "print (\"Prediction (Softmax) from the neural network:\\n\\n {}\".format(prediction))\n",

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"hard_maxed_prediction = np.zeros(prediction.shape)\n",
"hard_maxed_prediction[0][np.argmax(prediction)] = 1\n",
"print (\n\n\nHard-maxed form of the prediction: \n\n\n {}".format(hard_maxed_prediction))\n",
"\n",
"print (\n\n\n----- Prediction ----- \n\n\n")\n",
"plt.imshow(example.reshape(28, 28), cmap=\n"gray\n")\n",
"plt.show()\n",
"print(\n\n\nFinal Output: {}".format(np.argmax(prediction)))"
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      "\n",
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"\n",
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        "ret, thresh = cv2.threshold(grey.copy(), 75, 255, cv2.THRESH_BINARY_INV)\n",
        "contours,hierarchy = cv2.findContours(thresh.copy(), cv2.RETR_EXTERNAL,\n        cv2.CHAIN_APPROX_SIMPLE)\n",
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"for c in contours:\n",
"    x,y,w,h = cv2.boundingRect(c)\n",
"    \n",
"    # Creating a rectangle around the digit in the original image (for displaying the digits fetched via
contours)\n",
"    cv2.rectangle(image, (x,y), (x+w, y+h), color=(0, 255, 0), thickness=2)\n",
"    \n",
"    # Cropping out the digit from the image corresponding to the current contours in the for loop\n",
"    digit = thresh[y:y+h, x:x+w]\n",
"    \n",
"    # Resizing that digit to (18, 18)\n",
"    resized_digit = cv2.resize(digit, (18,18))\n",
"    \n",
"    # Padding the digit with 5 pixels of black color (zeros) in each side to finally produce the image of (28,
28)\n",
"    padded_digit = np.pad(resized_digit, ((5,5),(5,5)), \"constant\", constant_values=0)\n",
"    \n",
"    # Adding the preprocessed digit to the list of preprocessed digits\n",
"    preprocessed_digits.append(padded_digit)\n",
"\n",
"print(\"\\n\\n\\n\\n-----Contoured Image-----\\n\")\n",
"import os, types\n",
"import pandas as pd\n",
"\n",
"def __iter__(self): return 0\n",
"\n",
"print=("\\n\\n\\n\\n-----Contoured Image-----\\n\")\n",
"plt.imshow(image, cmap=\"gray\")\n",
"plt.show()\n",
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