

TEAM ID	PNT2022TMID07039
PROJECT	A Novel Method for Handwritten Digit Recognition System

RECOGNIZER.PY

```

import os
import random
import string
from pathlib import Path
import numpy as np
from tensorflow.keras.models import load_model
from PIL import Image, ImageOps

def random_name_generator(n: int) -> str:
    """
    Generates a random file name.

    Args:
    n (int): Length the of the file name.

    Returns:
    str: The file name.
    """

```

```
return ".join(random.choices(string.ascii_uppercase +
string.digits, k=n))
```

```
def recognize(image: bytes) -> tuple:
```

```
    """
```

Predicts the digit in the image.

Args:

Returns:

tuple: The best prediction, other predictions and file name

```
    """
```

```
model=load_model(Path("./model/model.h5"))
```

```
img = Image.open(image).convert("L")
```

```
# Generate a random name to save the image file.
```

```
img_name = random_name_generator(10) + '.jpg'
```

```
if not os.path.exists(f"./static/data/"):

```

```
os.mkdir(os.path.join('./static/', 'data'))
```

```
img.save(Path(f"./static/data/{img_name}"))
```

```
# Convert the Image to Grayscale, Invert it and
Resize to get better prediction.
```

```
img = ImageOps.grayscale(img)
```

```
img = ImageOps.invert(img)
img = img.resize((28, 28))
# Convert the image to an array and reshape the data
to make prediction.
img2arr = np.array(img)
img2arr = img2arr / 255.0
img2arr = img2arr.reshape(1, 28, 28, 1)
results = model.predict(img2arr)
best = np.argmax(results,axis = 1)[0]
# Get all the predictions and it's respective accuracy.
pred = list(map(lambda x: round(x*100, 2),
results[0]))
values = [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
others = list(zip(values, pred))
# Get the value with the highest accuracy
best = others.pop(best)
return best, others, img_name
```