

Handwritten Digits Recognition using Neural Networks

This project uses neural networks to learn to recognize optical handwritten digits

Getting Started

Clone the Repository

To get started, clone the repository using Git:

```
git clone https://github.com/smebellis/cis581_project2_digits_recognition.git
```

Then, navigate into the project directory:

```
cd cis582_project2_digits_recognition
```

Prerequisites

Ensure you have the following Python packages installed: - numpy - pandas - matplotlib - scikit-learn

You can install these by running:

```
pip install -r requirements.txt
```

*Tip: It is recommended to use a virtual environment (e.g., using **venv** or **conda**) for dependency isolation.*

How to Run the Code

There are three ways to execute this project:

1. Run as a Python Command Line Application

1. Install Requirements:

Ensure you have installed all the necessary packages (see Prerequisites).

2. Execute the Script:

Run the Python script from the command line while providing the required arguments. For example: “`bash python main.py ### 2. Run Using the Provided Bash Script`”

The project includes a bash script (e.g., `run.sh`) to streamline execution.

1. Make the Script Executable (on Unix-like systems):

On a new computer, you may need to change the script's permissions:

```
chmod +x run.sh
```

2. Execute the Script:

Run the script from your terminal:

```
./run.sh
```

3. Windows Considerations:

- On Windows, you cannot run bash scripts natively.
- Install **Git Bash** or use **Windows Subsystem for Linux (WSL)** to run the script.

3. Run the PyInstaller Executable

An executable version of the application has been created using PyInstaller. Note the following:

- **Running the Executable:**
Simply run the executable file (e.g., **main**) from your command line.
- **Windows Compatibility:**
Since the executable was compiled using WSL2, it may not run directly on native Windows. In that case, use **WSL2** or a **Linux environment** to execute it.

Example Execution

Using Python Directly:

```
python main.py
```

Using the Bash Script:

1. On Linux/WSL/Git Bash:

```
chmod +x run.sh
./run.sh
```

Using the PyInstaller Executable:

```
./main
```

(On Windows, run the executable from a Linux-like environment such as WSL2.)