Coloring Pipeline Installation and Prerequisites

This document provides detailed instructions for installing and configuring all necessary dependencies for the Coloring Pipeline on **Windows**, **macOS**, and **Linux**, including optional Python virtual environment setup (venv) and one-click wrappers.

Prerequisites

The pipeline requires the following software:

1. **Python 3.x**
2. **ImageMagick** (with command-line tools and delegates for PNG)
3. **Inkscape** (version 1.2+ recommended)
4. **Potrace** (New tracing engine)

All dependencies must be available in your system `PATH`.

Windows Installation

Python 3.x

1. Download from python.org
2. During installation, ensure **"Add Python to PATH"** is checked.
3. Verify installation:

```
python --version
```

ImageMagick

1. Download the Windows installer from ImageMagick Downloads
2. Choose the **dynamic release** that includes `Install legacy utilities (e.g., convert)`
3. During installation, check **"Add to PATH"**
4. Verify delegates and path:

```
magick -list format | findstr PNG
```

Potrace (Required)

1. Download the **Windows (64-bit)** zip from SourceForge Potrace Downloads.
2. Extract the zip file. You will see `potrace.exe`.
3. Move the extracted folder to a permanent location (e.g., `C:\Program Files\potrace`).
4. **Add to PATH:**

- Press the `Windows Key` and type "env". Select **"Edit the system environment variables"**.
- Click **"Environment Variables"**.
- Under **"System variables"**, find `Path` and click **"Edit"**.
- Click **"New"** and paste the path to your folder (e.g., `C:\Program Files\potrace`).
- Click OK -> OK -> OK.

5. Verify installation:

```
potrace --version
```

Inkscape

1. Download from Inkscape Downloads
2. Install and ensure the option **"Add to PATH"** is selected
3. Verify installation:

```
inkscape --version
```

Optional: Python Virtual Environment (venv)

1. Navigate to your project folder containing `process_coloring_pipeline.py`:

```
cd G:\Path\To\coloring_pipeline
```

2. Create a venv folder:

```
python -m venv venv
```

3. Activate the venv:

```
.\venv\Scripts\Activate.ps1
```

4. Deactivate when done:

```
deactivate
```

Note: The provided wrapper `run_pipeline.bat` automatically activates the venv if it exists.

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macOS Installation

Python 3.x

macOS 12+ comes with Python pre-installed, but we recommend using Homebrew:

```
/bin/bash -c "$(curl -fsSL [https://raw.githubusercontent.com/Homebrew/install/HEAD/install.
brew install python
python3 --version
```

ImageMagick

```
brew install imagemagick
magick -list format | grep PNG
```

Potrace (Required)

```
brew install potrace
potrace --version
```

Inkscape

```
brew install --cask inkscape
inkscape --version
```

Optional: Python Virtual Environment (venv)

```
cd /path/to/coloring_pipeline
python3 -m venv venv
source venv/bin/activate
# Deactivate after use
deactivate
```

> Note: The shell script wrapper `run_pipeline.sh` will automatically activate the venv if it exists.

Make the Wrapper Executable

```
chmod +x run_pipeline.sh
```

This step is required once so the shell script can be run by double-clicking or from Terminal.

Linux Installation (Debian/Ubuntu)

Python 3.x

```
sudo apt update
sudo apt install python3 python3-pip
python3 --version
```

ImageMagick

```
sudo apt install imagemagick
magick -list format | grep PNG
```

Potrace (Required)

```
sudo apt install potrace
potrace --version
```

Inkscape

```
sudo apt install inkscape
inkscape --version
```

Optional: Python Virtual Environment (venv)

```
cd /path/to/coloring_pipeline
python3 -m venv venv
source venv/bin/activate
# Deactivate after use
deactivate
```

> Note: The shell script wrapper `run_pipeline.sh` will automatically activate the venv if it exists.

PATH Verification

To confirm all tools are properly installed and available in PATH:

```
python --version
magick -version
potrace --version
inkscape --version
```

If any command fails, check that the installation folder is added to your system PATH and restart your terminal/command prompt.

This completes the installation and configuration steps. After this, the Coloring Pipeline script and optional wrappers should run without any additional setup.