GURU NANAK COLLEGE BUDHLADA

DEPARTMENT: COMPUTER

NAME OF PROJECT: image To ASCII

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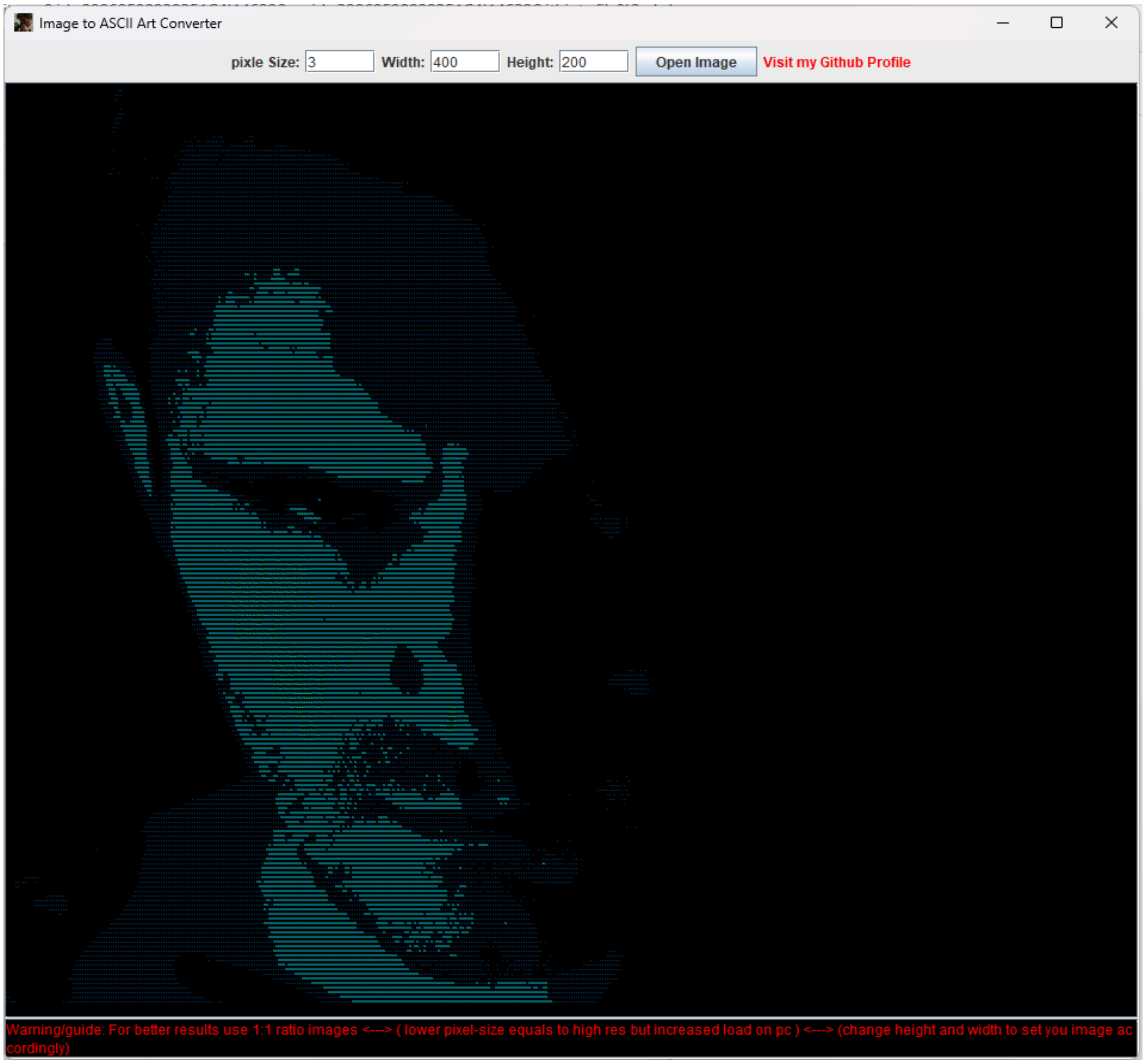
1. Introduction

The Image to ASCII Art Converter is a Java-based application that converts images into ASCII art. It provides a graphical user interface (GUI) for users to

- open an image file
- adjust settings such as
  - pixel size
  - Width-Height
- And view the resulting ASCII representation of the image.

Project repository (https://github.com/dullat)

Preview: 1



pixle Size: 3 Width: 400 Height: 200

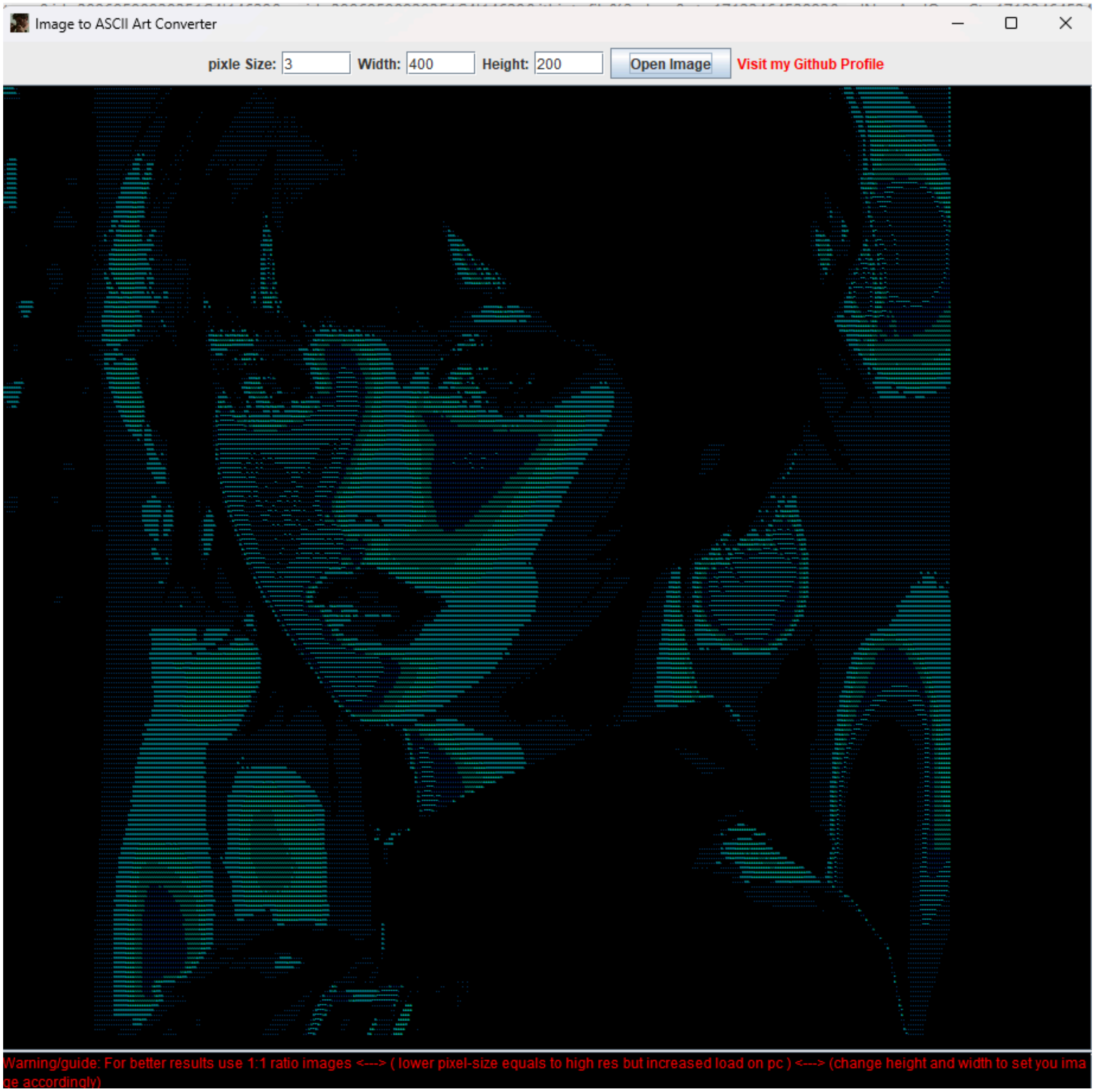
Warning/guide: For better results use 1:1 ratio images <---> (lower pixel-size equals to high res but increased load on pc) <---> (change height and width to set you image accordingly)

2. Functionality

The main functionality of the application includes:

- Opening an image file using a file chooser dialog.
- Adjusting pixel size, width, and height of the output ASCII art.
- Displaying the ASCII representation of the image in a text area.
- Providing warnings and guidance for optimal results.

Preview 2:



pixle Size: 3 Width: 400 Height: 200

Warning/guide: For better results use 1:1 ratio images <---> (lower pixel-size equals to high res but increased load on pc) <---> (change height and width to set you image accordingly)

3. Code Explanation

Class Structure

- **ImageToAsciiGUI**: The main class representing the GUI application. It extends **JFrame** and contains components for user interaction.

Methods

- **openImage()**: Opens a file chooser dialog to select an image file, reads the selected image, and generates ASCII art from it.
- **updateFontSize()**: Updates the font size of the ASCII art based on user input.
- **generateAsciiArt(BufferedImage image)**: Generates ASCII art from a given image.
- **resize(BufferedImage image, int width, int height)**: Resizes an image to a specified width and height.
- **mapToAscii(int gray)**: Maps a grayscale value to an ASCII character.
- **displayMessage(String message)**: Displays a message in the message area of the GUI.
- **clearMessage()**: Clears the message area.
- **main(String[] args)**: Entry point of the application, invoking the GUI creation.

CODE

```
import javax.imageio.ImageIO;

import javax.swing.*;


import java.awt.*;

import java.awt.image.BufferedImage;

import java.io.File;

import java.io.IOException;

import java.net.URI;
import java.awt.event.*;


public class ImageToAsciiGUI extends JFrame {
    private JTextArea asciiTextArea;
    private JTextField fontSizeTextField;
    private JTextField widthTextField;
    private JTextField heightTextField;
    private JTextArea messageArea;

    public ImageToAsciiGUI() {
        setTitle("Image to ASCII Art Converter");
        setSize(800, 600);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        JPanel contentPane = new JPanel();
        contentPane.setLayout(new BorderLayout());
        contentPane.setBackground(Color.BLACK);

        asciiTextArea = new JTextArea();
        asciiTextArea.setEditable(false);
        asciiTextArea.setFont(new Font("Monospaced", Font.PLAIN,
3));// default pixl size to 3
        asciiTextArea.setForeground(Color.CYAN); // setting color to
aqua
        asciiTextArea.setBackground(Color.BLACK);// setting bg
        JScrollPane scrollPane = new JScrollPane(asciiTextArea);

        // pixelsize label and text field
        JLabel fontSizeLabel = new JLabel("pixle Size:");
        fontSizeTextField = new JTextField("3", 5); // Default font
size
        fontSizeTextField.addActionListener(e -> updateFontSize());



        JLabel widthLabel = new JLabel("Width:");
        widthTextField = new JTextField("400", 5); // Default width
        JLabel heightLabel = new JLabel("Height:");
        heightTextField = new JTextField("200", 5); // Default height

        //image button
        JButton openImageButton = new JButton("Open Image");
        openImageButton.addActionListener(e -> openImage());

        // control panel
        JPanel controlPanel = new JPanel();
        controlPanel.add(fontSizeLabel);
        controlPanel.add(fontSizeTextField);
        controlPanel.add(widthLabel);
        controlPanel.add(widthTextField);
        controlPanel.add(heightLabel);
        controlPanel.add(heightTextField);
        controlPanel.add(openImageButton);

        //warnings
        messageArea = new JTextArea("Warning/guide: For better
results use 1:1 ratio images <---> ( lower pixel-size equals to high
res but increased load on pc ) <---> (change height and width to set
you image accordingly)");
```

```
    messageArea.setEditable(false);
    messageArea.setForeground(Color.RED);
    messageArea.setBackground(Color.BLACK);
    messageArea.setLineWrap(true);

    JScrollPane messageScrollPane = new JScrollPane(messageArea);



    contentPane.add(scrollPane, BorderLayout.CENTER);
    contentPane.add(controlPanel, BorderLayout.NORTH);
    contentPane.add(messageScrollPane, BorderLayout.SOUTH);

    setContentPane(contentPane);
    setVisible(true);

    // setting logo
    try {
        BufferedImage iconImage =
ImageIO.read(getClass().getResourceAsStream("profile.png"));

//         BufferedImage iconImage = ImageIO.read(new
File("profile.png"));
        setIconImage(iconImage);
    } catch (IOException ex) {
        System.out.println("cant load image: " +
ex.getMessage());
    }

    //github link
    JLabel githubLink = new JLabel("Visit my Github Profile");
```

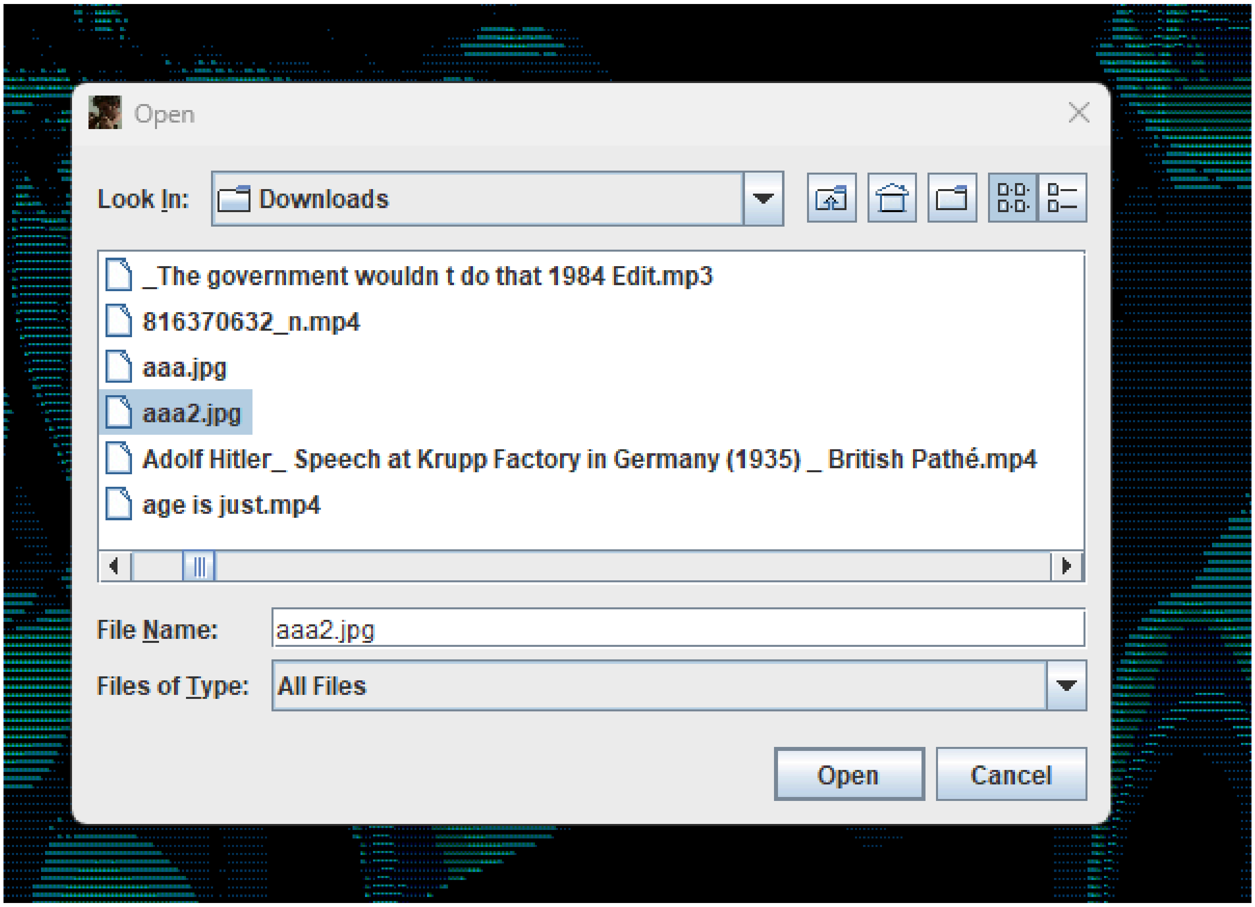
```
        githubLink.setCursor(new Cursor(Cursor.HAND_CURSOR));
        githubLink.setForeground(Color.RED);
        githubLink.addMouseListener(new MouseAdapter() {
            @Override
            public void mouseClicked(MouseEvent e) {
                try {
                    Desktop.getDesktop().browse(new
URI("https://github.com/dullat"));
                } catch (Exception ex) {
                    ex.printStackTrace();
                }
            }
        });
        controlPanel.add(githubLink);

    }

    private void openImage() {
        JFileChooser fileChooser = new JFileChooser();
        int returnValue = fileChooser.showOpenDialog(this);

        if (returnValue == JFileChooser.APPROVE_OPTION) {
            File selectedFile = fileChooser.getSelectedFile();
            try {
                BufferedImage image = ImageIO.read(selectedFile);
                String asciiArt = generateAsciiArt(image);
                asciiTextArea.setText(asciiArt);
                //clearMessage();// clear warning message. disabled
            } catch (IOException ex) {
                ex.printStackTrace();
                displayMessage("Error: selectedfile is not valid.");
            }
        }
    }

    private void updateFontSize() {
        try {
            int fontSize =
Integer.parseInt(fontSizeTextField.getText());
            asciiTextArea.setFont(new Font("Monospaced", Font.PLAIN,
fontSize));
            //clearMessage(); // Clear any previous messages
        } catch (NumberFormatException ex) {
            displayMessage("enter a valid font size.");
        }
    }

    private String generateAsciiArt(BufferedImage image) {
        StringBuilder asciiArt = new StringBuilder();



        int asciiWidth = Integer.parseInt(widthTextField.getText());
        int asciiHeight =
Integer.parseInt(heightTextField.getText());

        BufferedImage resizedImage = resize(image, asciiWidth,
asciiHeight);

        for (int y = 0; y < asciiHeight; y++) {
            StringBuilder asciiRow = new StringBuilder();
            for (int x = 0; x < asciiWidth; x++) {
                int pixel = resizedImage.getRGB(x, y);
                int gray = (getRed(pixel) + getGreen(pixel) +
getBlue(pixel)) / 4;
                char asciiChar = mapToAscii(gray);
                asciiRow.append(asciiChar);
            }
            asciiArt.append(asciiRow).append("\n");
        }
        return asciiArt.toString();
    }

    private BufferedImage resize(BufferedImage image, int width, int
height) {
        BufferedImage resizedImage = new BufferedImage(width, height,
BufferedImage.TYPE_INT_RGB);
        Graphics2D g = resizedImage.createGraphics();
        g.drawImage(image, 0, 0, width, height, null);
        g.dispose();
        return resizedImage;
    }

    private int getRed(int rgb) {
        return (rgb >> 16) & 0xFF;
    }

    private int getGreen(int rgb) {
        return (rgb >> 8) & 0xFF;
    }
    private int getBlue(int rgb) {
        return rgb & 0xFF;
    }



    private char mapToAscii(int gray) {
        char[] asciiChars = {' ', '.', '8', '&', 'o', ':', '*', '.',
' '}; // ASCII characters working as Pixles
        int index = (int) (gray * ((asciiChars.length - 1) / (255.0 *
0.7)));
        return asciiChars[index];
    }



    private void displayMessage(String message) {
        messageArea.setText(message);
    }


    private void clearMessage() {
        messageArea.setText("");
    }


    public static void main(String[] args) {
        SwingUtilities.invokeLater(ImageToAsciiGUI::new);
    }
}
```

4. Usage Guide

To use the Image to ASCII Art Converter:

- Launch the application by running the main method.
- Click on the "Open Image" button to select an image file.
- Adjust the pixel size, width, and height settings as desired.
- View the resulting ASCII art in the text area.
- For optimal results, follow the provided warnings and guidance.

Choose an image



Look In: Downloads

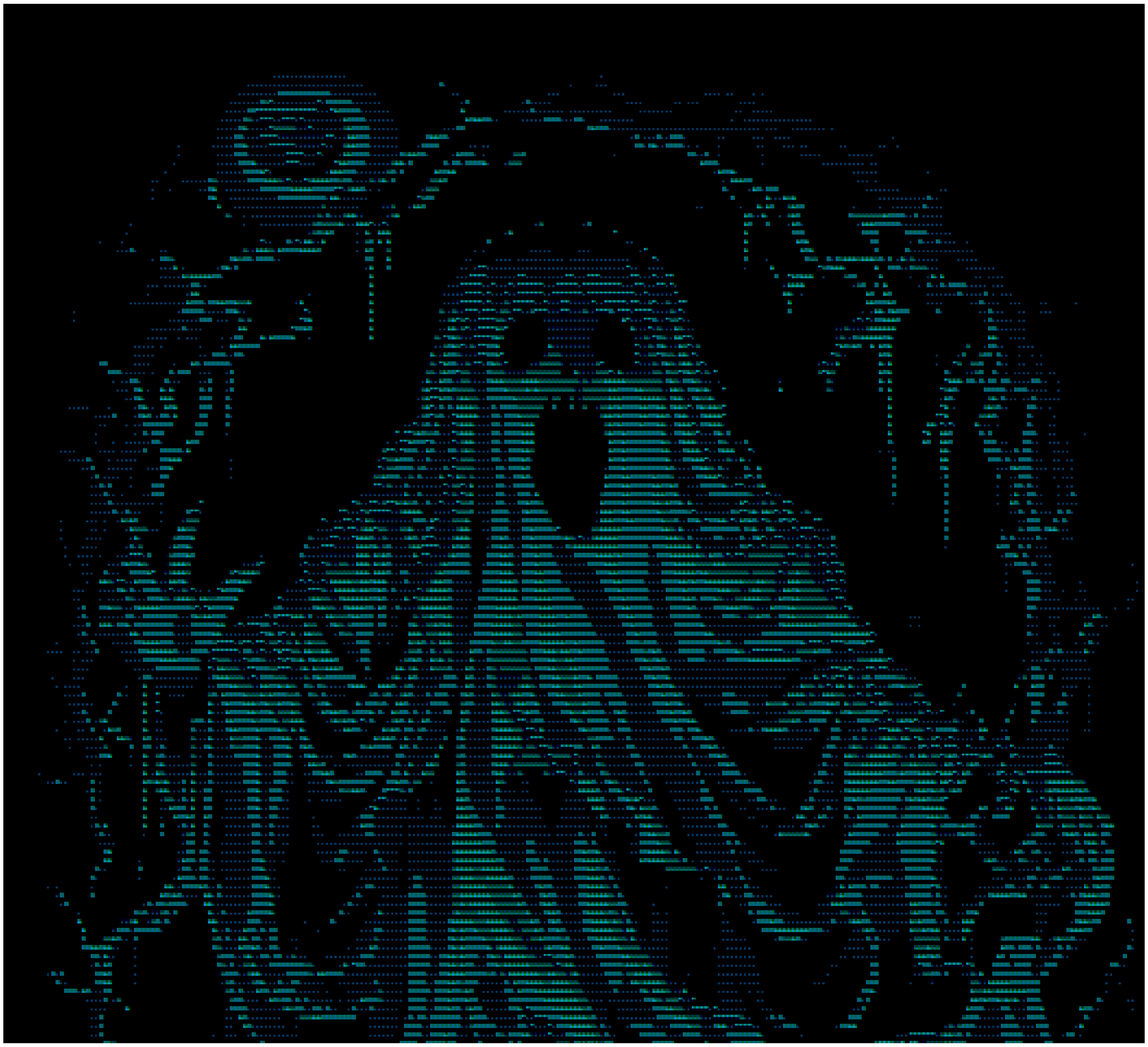
_The government wouldn t do that 1984 Edit.mp3
816370632_n.mp4
aaa.jpg
aaa2.jpg
Adolf Hitler_ Speech at Krupp Factory in Germany (1935) _ British Pathé.mp4
age is just.mp4

File Name: aaa2.jpg

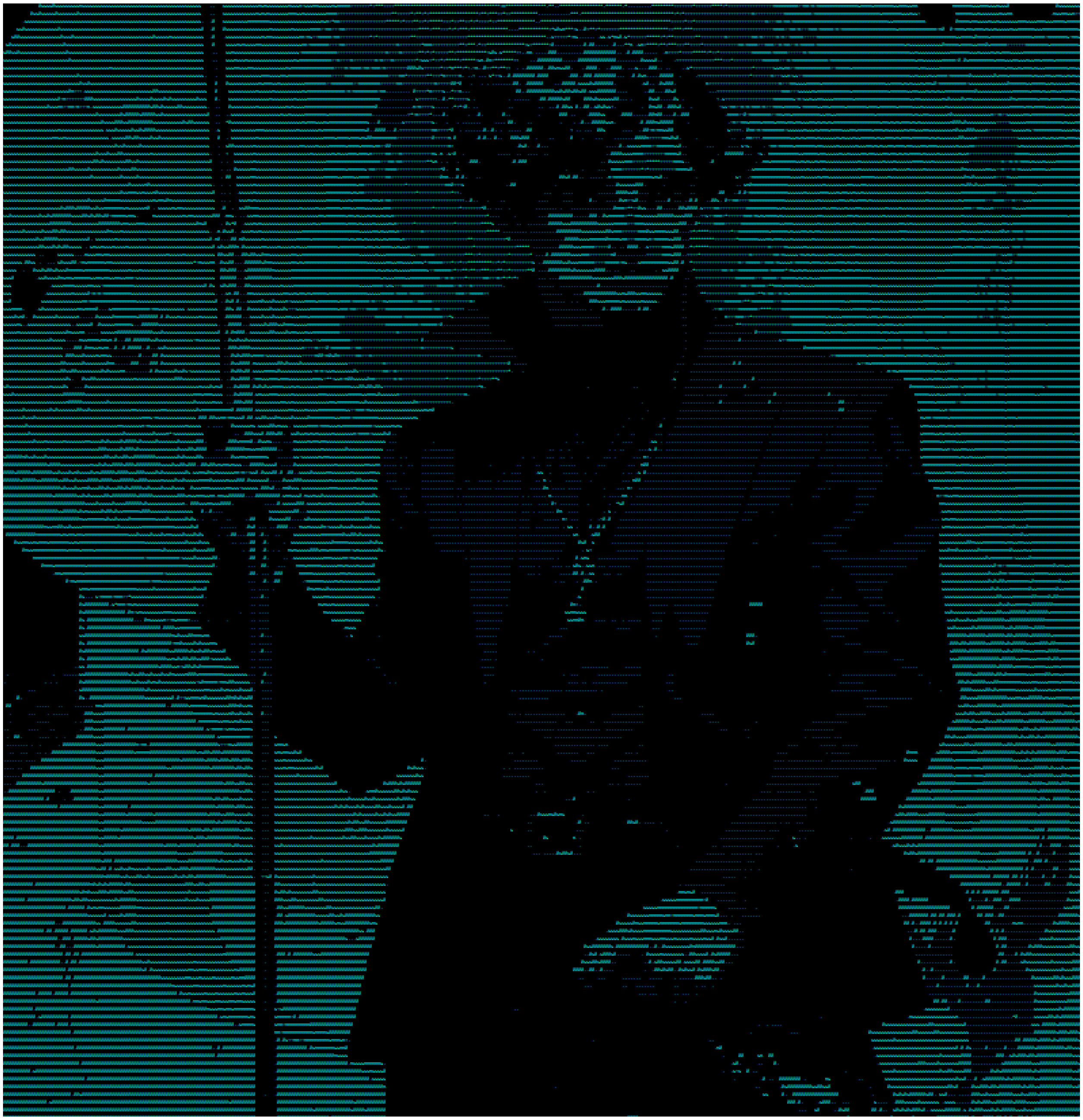
Files of Type: All Files

5. OUTPUT

OUPTUT 1



OUTPUT 2



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