Design Document
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Greyscale program
Erinstagram

Data

ImageMatrix – 2D array of integers to store any numerical brightness info
Image file – string to store file path for image
Edit history – 2d arrays for history of edits for undo functionality
currentEdit – 2D array of integers to store the current state of the image edited

Game Play/Program flow

- The user starts the program and is presented with a menu to load a new image, edit the current image, display the image, or exit the program.
- If the user chooses to load a new image, the program will prompt for a file name and attempt to load the image.
- If the user chooses to edit the image, a sub-menu will provide options to crop, dim, brighten, or rotate the image.
- Once an edit is complete, the edited image is displayed, and the user can choose to save it.
- The user can undo edits or return to the main menu at any point.

Functions

main()
Function type: Int
Functionality: initializes the main menu loop. Allows to begin edits or to load an image.

loadImage()
Function type: int
Input Parameters: char* filePath
Returned Output: int imageMatrix
Functionality: Opens the image file located at filePath, reads the grayscale values, and stores them in imageMatrix. Returns 0 on success, non-zero error code on failure.

saveImage()

Function Type: int
Input Parameters: char filePath , int ImageMatrix 2d array
Returned Output: none
Functionality: Writes the grey scale values for the image matrix to the file pulled from filePath

displayImage()

Type: void
Input Parameters: int image matrix
Returned Output: n/a
Functionality: iterates over the image matrix for each value and prints to the console the corresponding letter for the console to visualize the image.

editImage()
Type: int
Input Parameters: int image matrix, char edit option, int edit Parameters
Returned Output: int image matrix
Functionality: depending on the edit option, it calls upon the appropriate edit function (crop, dim, brighten, rotate) returns to the edited Matrix

crop()
Type: int
Parameters: int image matrix, int startX, int startY, int endX, int endY
Returned Output: int cropped matrix
Functionality: Crops the image matrix within specified coordinates and returns a cropped matrix.

dim()
Type: int
Input Parameters: int image matrix
Returned Output: int dimmed matrix
Functionality: decreases the brightness of each pixel in the image matrix by 1, making sure that it does not allow negative values to account for weird edgecases. Returns a dimmed matrix.

brighten()
Type: int
Input Parameters: int image matrix
Returned Output: int brightened matrix
Functionality: Increases the brightness of each pixel in image Matrix by 1, up to the maximum allowed value. Returns brightened Matrix.

Rotate90()
Type: int
Input Parameters: image matrix int
Returned Output: rotated image int
Functionality: rotates the image by 90 degrees clockwise and returns a rotated Matrix.