

**CS135 – Final Project Design Document – 1106 Team 2**  
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**Image Processing**

**Data**

- Image – char 2D array
- File Name – char string
- Row and Column Counts, user input variables – int
- File pointer - FILE\*
- Max String and Array – MACROS

**Main Function**

declare char 2D image array and filename string, both with max value macros  
declare int row and column counts, user input variable  
declare file pointer

do while loop(while input is not 5)  
    display main menu function  
    get user input

switch selection for input 1:  
    if input is 1:  
        get file name function  
        open filename stream in read mode  
        if pointer is null  
            display failure message  
            return 0  
        else  
            read file function  
            close file stream

    if input is 2:  
        display image function

    if input is 3:  
        display edit menu function  
        get user input

switch selection for input:

```
        if input is 1:
            crop image function
        if input is 2:
            dim/brighten image funct w/ parameter var 1
        if input is 3:
            dim/brighten image funct w/ parameter var -1
    if input is 4:
        get file name function
        open filename stream in write mode
        if pointer is null
            display failure message
        else
            display image function (edited image, filename
            pointer)
    if input is 5:
        do nothing
(end loop)
```

## **Functions**

### **Display Main Menu**

Input Parameters: none

Returned Output: void

Algorithm:

- display option 1: Load new image
- display option 2: Display Image
- display option 3: Edit image
- display option 4: Save Image

### **Display Edit Menu**

Input Parameters: none

Returned Output: void

Algorithm:

- display option 1: Crop image
- display option 2: Brighten Image
- display option 3: Dim image

### **Get File Name**

Input Parameters: char filename string

Returned Output: void

Algorithm:

- display prompt for filename

- fgets filename string

- loop: if filename string index (from 0) is not \0

  - if indexed filename element is the newline character

  - filename element is set to \0

### **Read File**

Input Parameters: int max rows, int max strings, int 2D Array, int\* row count, FILE\* pointer

Returned Output: column count

Algorithm:

- loop: if row index (starting at 0) is less than max rows value

  - fgets string of digits from the file pointer

  - increment row index

//counting rows and columns:

- nested for loops: (indexes are incremented)

  - outer: if row index (=0) is less than row max

  - inner: if array[row index],[string index (=0)] is not \0

    - \*row count equal to row index+1

    - column count equal to index-1

- return column count

### **Display Image**

Input Parameters: int max rows, int max strings, char 2D Array, file pointer

Returned Output: void

Algorithm:

- nested for loops: (indexes are incremented)

  - outer: if row index (=0) is less than row max

  - inner: if array[row index],[string index (=0)] is not \0

    - switch selection array[row index,string index]:

      - if entry is 0:

        - replace entry with [space]

        - fprintf entry

```

if entry is 1:
    replace entry with .
    fprintf entry
if entry is 2:
    replace entry with o
    fprintf entry

if entry is 3:
    replace entry with O
    fprintf entry
if entry is 4:
    replace entry with 0
    fprintf entry
default:
    fprintf(\n)

```

### **Crop Image**

Input Parameters: int max rows, int max string, char image 2D Array

Returned Output: void

Algorithm:

```

declare side and pixel variables
Display Crop Menu
scanf pixel input
nested for loops: (indexes are incremented)
    outer: if row index (=0) is less than row max
        inner: if array[row index],[string index (=0)] is not \0
            image array is equal to the saved input image with the
            saved image indexes adjusted according to the pixel
            and side choices. connect this to the row and column
            size variables to lessen index errors.

```

### **Crop Menu**

Input Parameters: none

Returned Output: char side input

Algorithm:

```

display prompt: "choose reference side"
display option 1: Top
display option 2: Bottom

```

display option 3: Left  
display option 4: Right  
get side input  
display prompt: "choose crop amount"  
display option 1: 1 pixel  
display option 2: 5 pixels  
display option 3: 10 pixels  
display option 4: 20 pixels  
return side input

### **Dim/Brighten Image**

Input Parameters: int max rows, int max strings, char 2D Array, dim/brighten variable

Returned Output: none

Algorithm:

```
nested for loops: (indexes are incremented)
    outer: if row index (=0) is less than row max
        inner: if array[row index],[string index (=0)] is not \0
            switch selection array[row index,string index]:
                if else entry is 0 and dim/brighten variable is
                    less than 0
                        do nothing
                if else entry is 4 and dim/brighten variable is
                    greater than 0
                        do nothing
                if else entry is \n
                    do nothing
            else
                replace entry with entry plus brighten/
                dim variable
```

