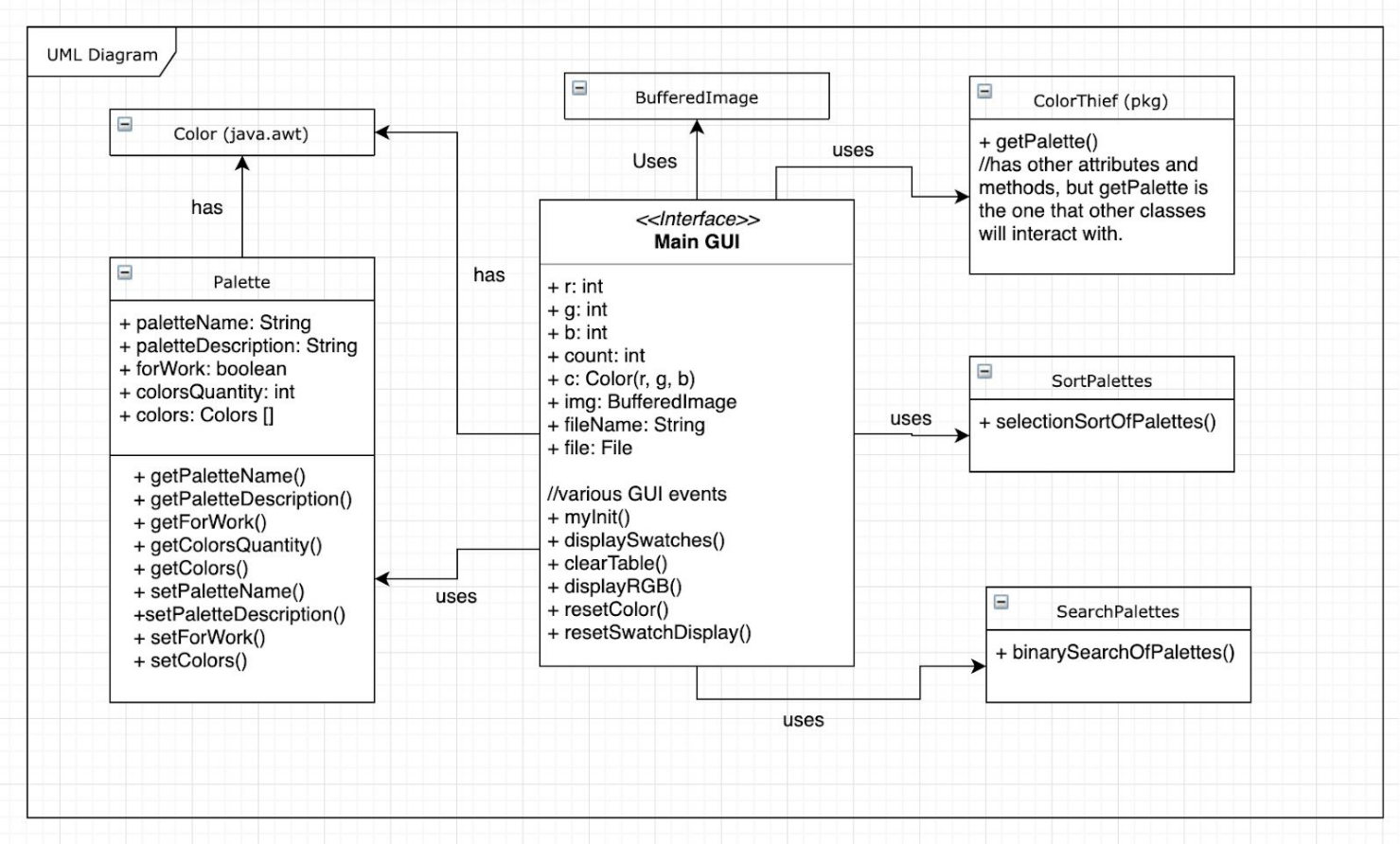
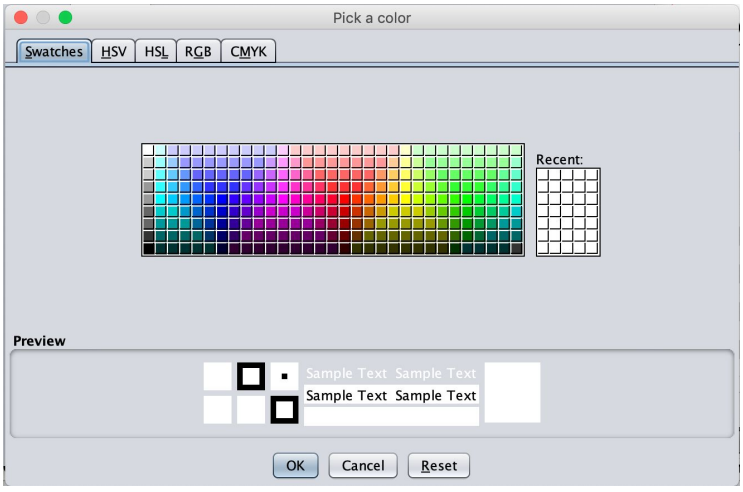
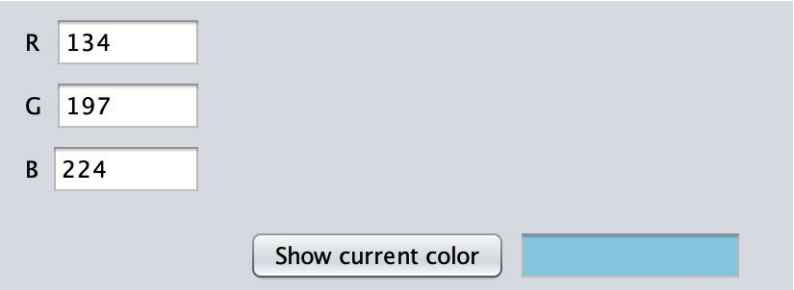
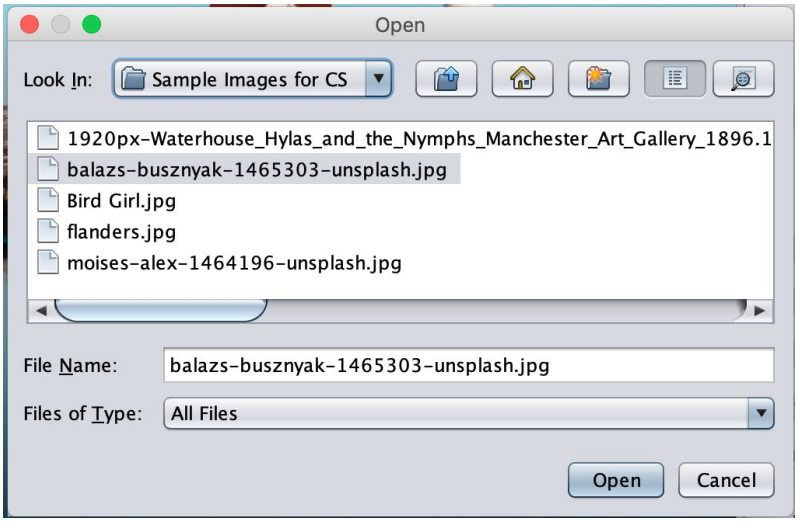
Criterion B: Detailed Design of Solution

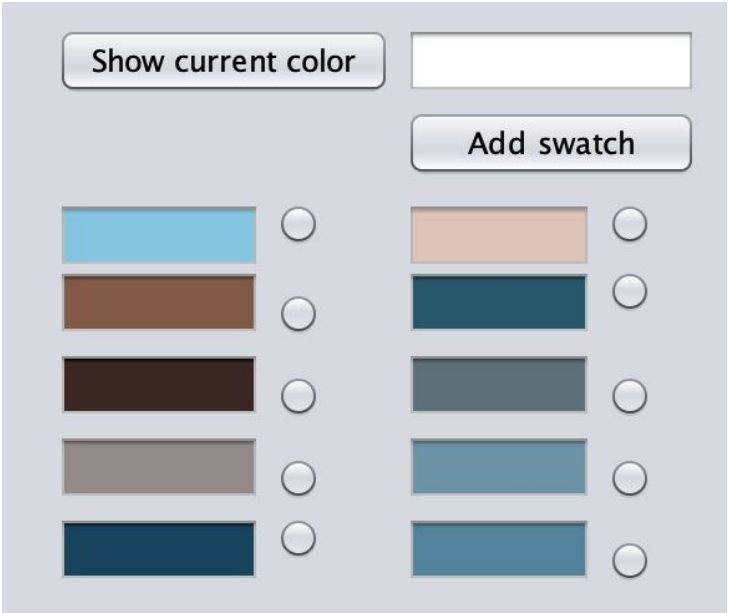
UML Diagram



Input	Data Type	Example
Color (jColorChooser GUI)	Color	Done through jColorChooser GUI. 

Color (Manually inputted RGB)	Int	“ 255, 24, 120” 
Image	Image (Buffered Image)	Done through fileChooser GUI 
Name of palette	String	“Warlock Character”
If the palette is personal/for work	boolean	Ticked checkbox
Description of the palette	String	“From the video game World of Warcraft”

Output	Data Type	Example
Palette	Color	displayed through an array of text fields.

		
Attributes of the palette	String and Int	Showed in display table. Includes length, name, description, and if for work/personal project.
RGB Components of the palette	String	Displayed in a continuous block of text allowing for easy copy/pasting
Image	Image	*for palette extraction

Development plan

Phase 0: Understanding

- Research special features
    - bufferedImage
    - Java Color class
    - Usage of colorThief algorithm

Phase 1: Methods

- Create methods that
    - Clears swatches
    - Displays swatches
    - Reset colors (global variable)
    - Shows color in text field (manual input)

Phase 2: Manual Input Tab

- Add features that show inputted colors in ‘current color’ and ‘palette’ swatch area.
- Develop algorithms that
    - Counter that increments as each swatch is added.

Pseudocode

```
if(radiobutton1 is selected){
Color c = get RGB background of current color
Count = 0
Clear selection of radio button
…
And so on, for else if statements with count and radio button
increasing based on GUI element
Reset r, g, and b global variables
```

- allows user to edit swatch.

Phase 3: Create from Image Tab

- Implement colorThief utility in a separate package
- Implement 'upload image' feature using bufferedImage, which then displays it.
- Applying Sven Woltman's colorThief algorithm

```
public static int[] getColor(BufferedImage sourceImage, int quality,
        boolean ignoreWhite) {
    int[][] palette  = getPalette(sourceImage, 5, quality, ignoreWhite);
    if (palette == null) {
        return null;
    }
    int[] dominantColor = palette[0];
    return dominantColor;
}
```

(above) colorThief method which returns a two-dimensional array of RGB arrays

Pseudocode of implementation

```
Declare two-dimensional array of paletteArrays, which is
getPalette method which takes in inputted image as arguments;
Declare two-dimensional array of colors called colorsArray;
for(int i = 0, i < 10; i++){
Color c = new Color(paletteArray([a] [0] , paletteArray[a][1],
paletteArray[a][2])
colorsArray[i] = c
Switch a
Case 0:
Set first textfield background as c
Case 1:
Set second textField background as c
And so on...
```

Phase 4: Database features

- Implement binary search and selection sort algorithm
- Create arrayList of Palette objects
- Make table that displays contents of that arrayList
- Additional functionality
    - Edit
    - Delete
    - Display RGB Components
    - **Pseudocode for RGB components**
    - Method which takes in a palette (an array of Color objects)
    - Declare String display and String temp
    - for(int i = 0; i < arr.length i++){
    - R = Integer.toString(array[i].get red color components)
    - Repeat for G and B
    - Display = display + "Color" + toString(i + 1) + r + g + b //adds on from previous values
    - Return display

Testing Plan: Manual Input Tab

Input	Normal	Border	Abnormal	Extreme
RGB Components (int)	100	0, 255 No number input (0 is okay)	“Twenty” >Warning message (incorrect data type)	No limit on what is allowed as long as value is between 0 - 255
Name (String)	“Shades of Blue”	Short name like “B” No name input , >Name will not show up in table unless edited	No limit on what is allowed.	Very long name, 50+ characters. No limit on what is allowed.
Color through colorPicker GUI	Any color that is available through the GUI.	N/A	No color selected >Displays white.	N/A
Description (String)	“For IB art project”	N/A	N/A	Very long description, 100+ words. No limit on what is allowed.
For Work (boolean)	Ticked/unticked checkbox	N/A	N/A	N/A

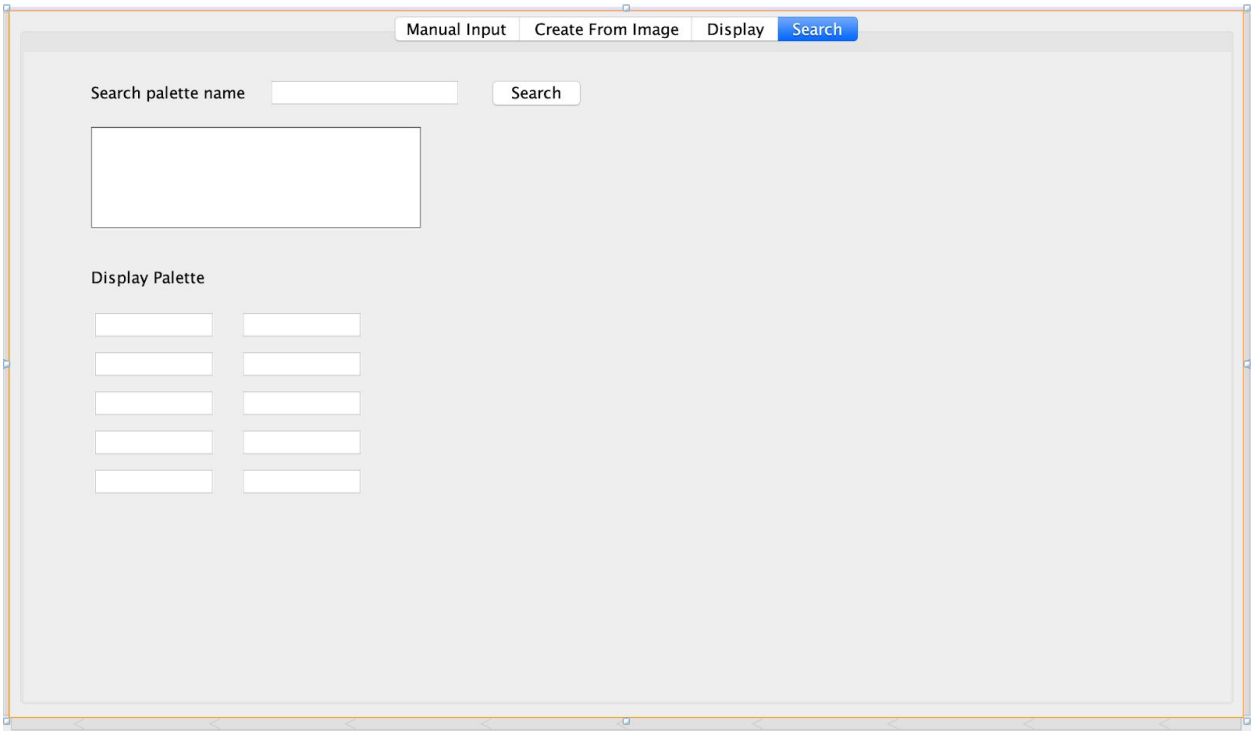
Testing Plan: Create From Image Tab

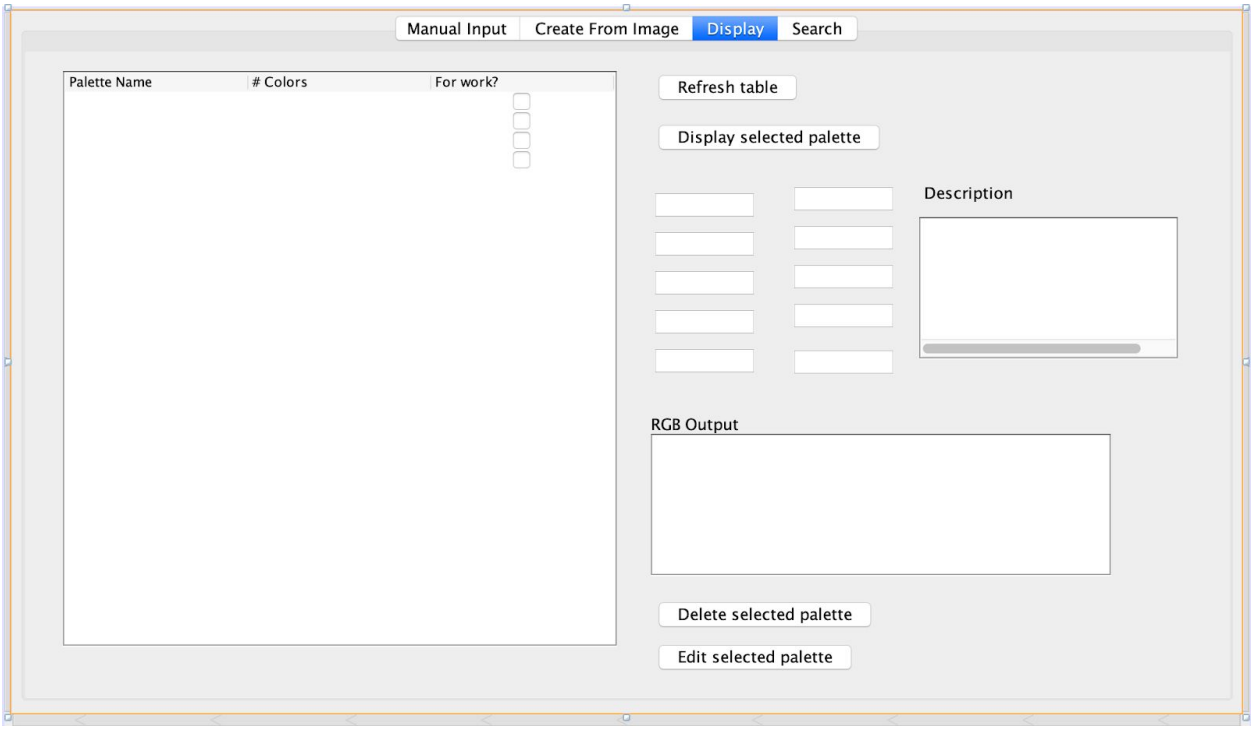
Input	Normal	Border	Abnormal	Extreme
File	Image files (JPEG, GIF, PNG, TIF)	Very large files. 15 MB + >Will take a while to load	Incompatible files (.pdf, .mov, .avi)	No limit on what is allowed. Loading time may increase if files are large.
Name (String)	“Shades of Blue”	Short name like “B” No name input , >Name will not show up in table unless edited	No limit on what is allowed.	Very long name, 50+ characters. No limit on what is allowed.

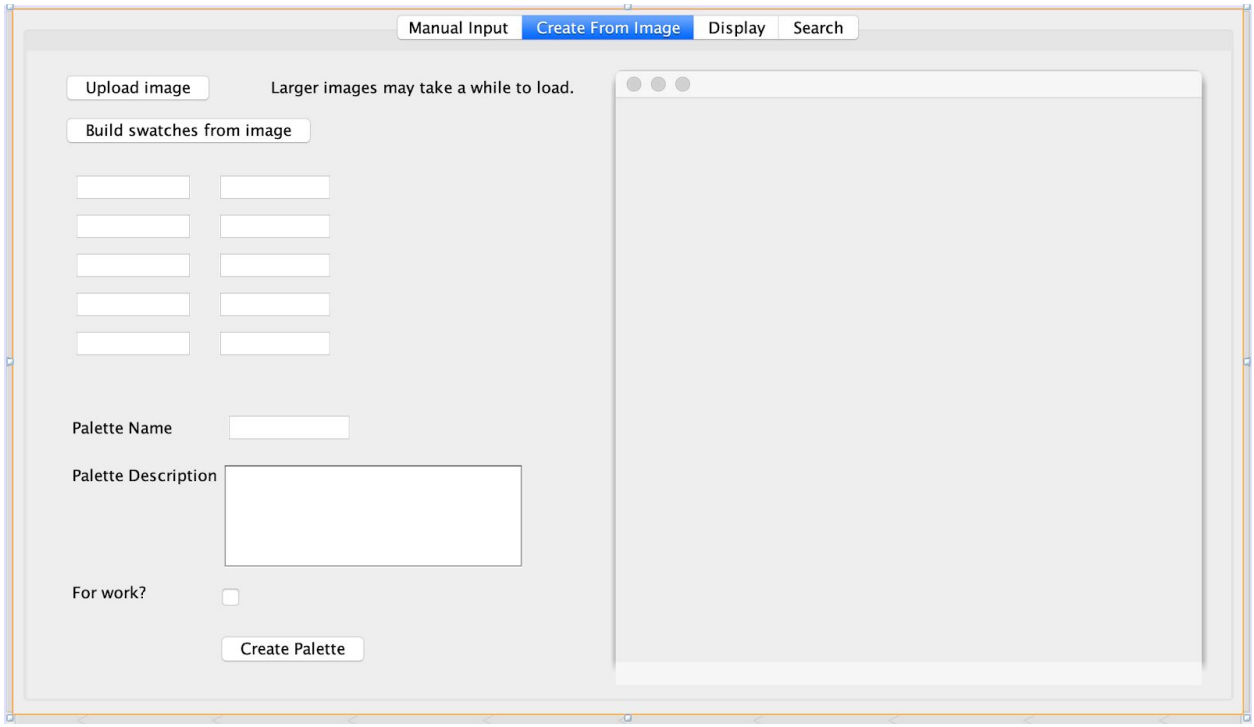
Description (String)	“For IB art project”	N/A	N/A	Very long description, 100+ words. No limit on what is allowed.
For Work (boolean)	Ticked/unticked checkbox	N/A	N/A	N/A

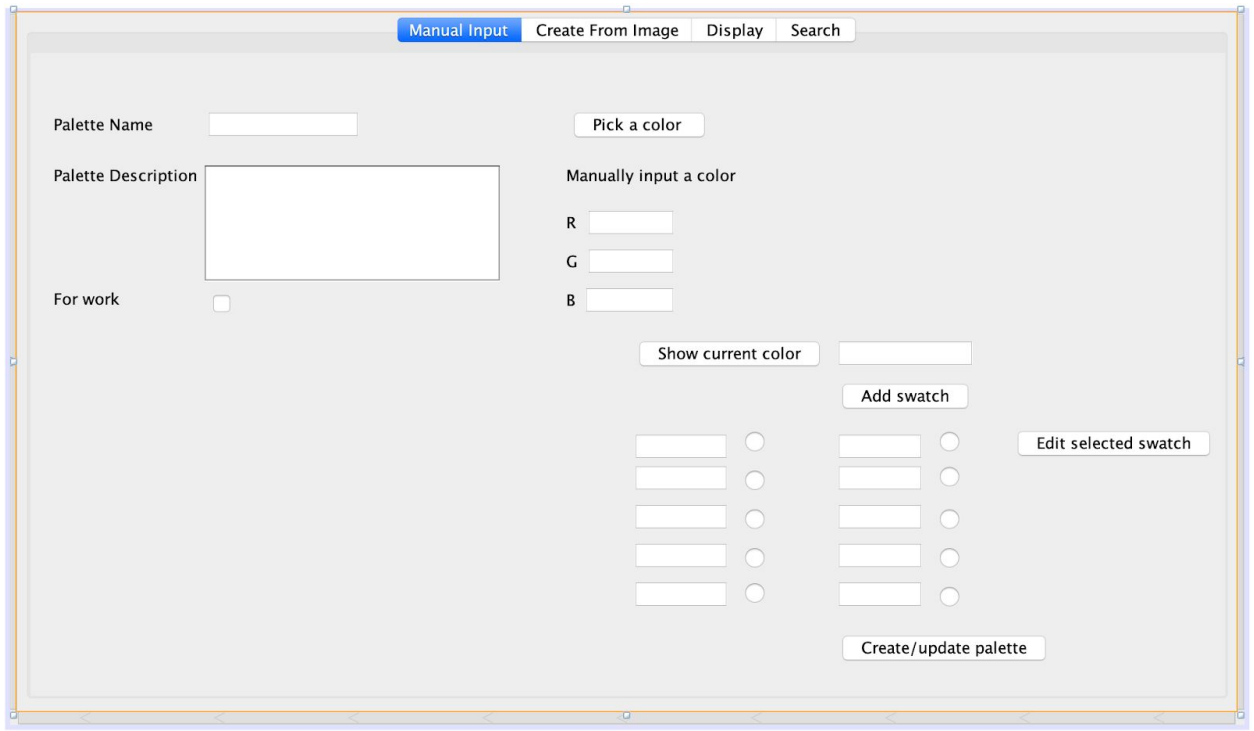
Word count: 98

Appendix 4: Final Prototype






Manual Input
Create From Image
Display
Search
Upload image
Larger images may take a while to load.
Build swatches from image
Palette Name
Palette Description
For work?
Create Palette


Manual Input
Create From Image
Display
Search
Palette Name
Palette Description
For work
Pick a color
Manually input a color
R
G
B
Show current color
Add swatch
Edit selected swatch
Create/update palette