Solution: Mini Project 1

In this lesson, you will see the solution review of the exercise given in the previous lesson.

We'll cover the following

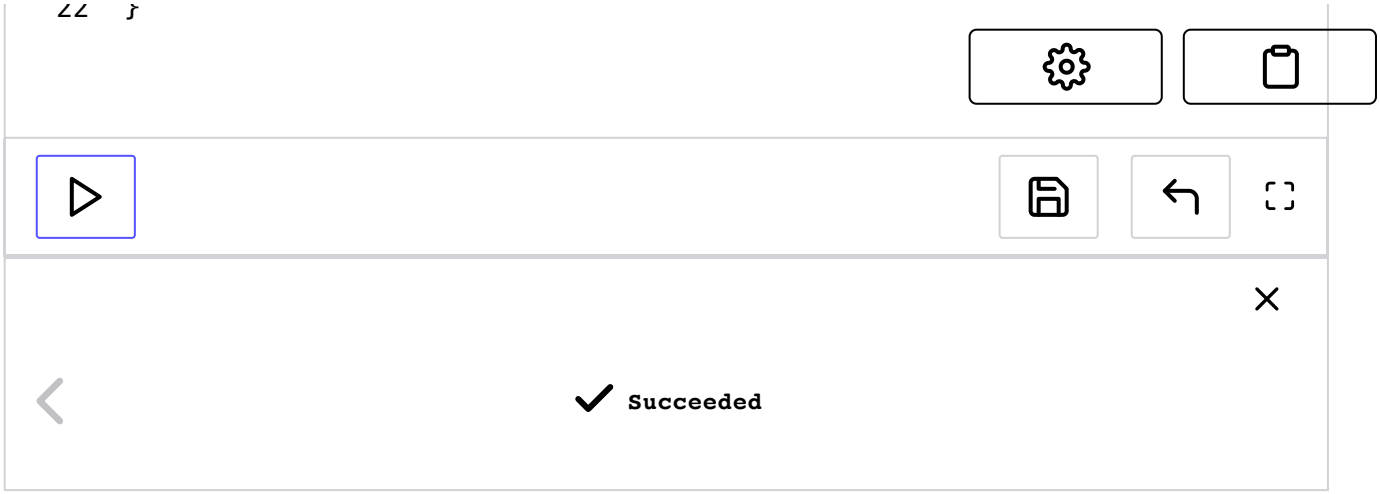
- Solution
- Explanation

Solution

Press the **RUN** button and see the output!

```
#include "imagelib.h"

int main() {
  // Displays input image
  loadFile("input.png");
  // Traverse rows in 2D array
  for (int i = 0; i < height; i++) {
    // Traverse columns in each row
    for (int j = 0; j < width; j++) {
      // Process pixel image[i][j], here
      if (image[i][j] <= 70) {
        // Sets image pixel to black
        image[i][j] = 0;
      } else {
        // Sets image pixel to white
        image[i][j] = 255;
      }
    }
  }
  // Displays modified image
  saveFile("output/modified.png");
}
```



Convert grayscale image into black and white

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Note: In the above code widget, you can see the modified image by pressing the arrow button `>` towards the right of the console.

Explanation#

In a grayscale image, a single 8-bit integer is used to represent the brightness of the pixel. **0** represents black, while **255** represents white, and everything in between 0 and 255 represents different shades of gray.

- The `height` specifies the number of rows present in a 2D array.
- The `width` specifies the number of columns present in a 2D array.

We need to process the image and apply a certain threshold to convert a grayscale image to a black and white one.

The number of pixels present in a 2D array will be equal to `width*height`. We can use nested `for` loops to access the pixels present in a 2D array. The outer `for` loop accesses the number of rows present in a 2D array, and the inner `for` loop accesses the number of columns present in each row.

We have applied a threshold for a pixel value, i.e., **70**. If the pixel value is less than or equal to **70**, we set that pixel to black (0 represents the black). If the

than or equal to 70, we set that pixel to black (0 represents the black). If the pixel value is greater than 70, we set that pixel value to white (255 represents the white).

You can play around with the code and make any changes to it to understand things better.

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Solution: Mini Project 2

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