Homework

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Green Screen

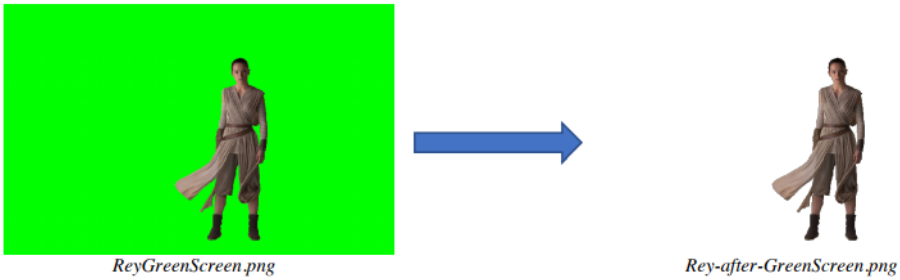
Last assignment you learned how to open a PNG file and process its pixels using pointers. In this assignment, you're going to put that to good use by implementing one of the big-screen movie effects: green-screen.

Open `h20.h` to see the prototype for the function you will write. The `greenScreen()` function will remove all green pixels, making them transparent. This is a `void` function that will modify the image passed as the first parameter. The code is already stubbed, so you can run `make test` and see that the code compiles.

You'll also see three extra folders: `input` which contains the photos we're going to start with, `expected`, which contains the photos as they should look, and `actual`, which contains the photos after your filters have been applied. If your code fails one of the tests, the `actual` folder will also have a rudimentary "diff" image you can examine. You can look at any of the photos just by double-clicking them in the IDE.

Green-screen is often used in movies to merge actors into a background. The technique uses a particular range of colors (such as green) to represent a background that can later be made transparent.

Your task in this function is to modify the image you are given, converting any `green` pixels into transparent ones, with no color information, such as the image below.



ReyGreenScreen.png *Rey-after-GreenScreen.png*

It is unlikely that any pixels will have pure **green** pixels (no **red** or **blue** with a **green** component of **255**), so you should treat a pixel as **green** if its **green** component is at least twice as large as the larger of its **red** and **blue** component. When you find a **green** pixel that meets these requirements, set all of its components—**red**, **green**, **blue** and **alpha** to **0**. If a pixel is not green, just skip it.

Here is some pseudocode you can follow:

```
Let p point the beginning of the image
Set end to point just past the end
While p != end
   If *(p + 1) is twice as large as max(red, blue)
      Clear all of the fields
   Increment p by 4
```

As always, if you run into problems, bring your questions to Piazza or to my office hours