LAB 03:
Arrays and Swap

Provided Files

- `main.c`
- `myLib.c`
- `myLib.h`
- `kitty.c`
- `kitty.h`

Files to Edit/Add

- `main.c`
- `kitty.c`
- `Makefile`
- `.vscode`
  - `tasks.json`

Instructions

In this lab, you'll be writing code to swap kitty structs. Note: Make sure to copy over your Makefile and .vscode/tasks.json from one of your previous assignments.

TODO 1.0

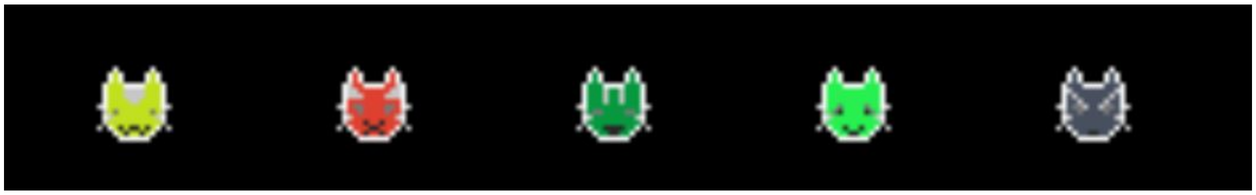
- In `kitty.c`, initialize the `kittyBitmaps` array. The array should contain the already defined bitmaps: `bitmap1`, `bitmap2`, `bitmap3`, `bitmap4`, and `bitmap5`.

TODO 2.0

- In `kitty.c`, complete the switch statement. In this switch statement, we are setting pixels a particular color based on the retrieved value from the kitty bitmap. Each kitty bitmap has 6 possible values, 0, 1, 2, 3, 4, or 5. Create a case for values 1, 2, 3, 4, and 5. The 0 case can be handled by the default statement, as we will not set the pixel any color if the value of the bitmap is 0.
  - For case 1, set the color of the pixel at `col + i`, `row + j` to `WHITE`.
    - `WHITE` is a macro defined for you in `myLib.h`.

- For case 2, set the color of the pixel to DARKGREY.
    - DARKGREY is a macro defined for you in `myLib.h`.
- For case 3, set the color of the pixel to GREY.
    - GREY is a macro defined for you in `myLib.h`.
- For case 4, set the color of the pixel to the kitty's `furColor`.
    - Make use of the kitty pointer that is passed into the function, and access that kitty struct's `furColor` member.
- For case 5, set the color of the pixel to LIGHTGREY.
    - LIGHTGREY is a macro defined for you in `myLib.h`.

- Build and run your lab thus far. You should see the following. If you do not, fix your code before moving forward.



TODO 3.0-3.2

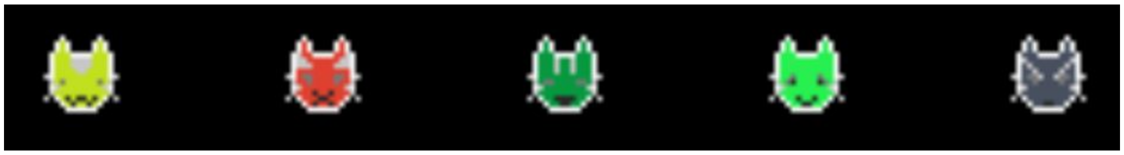
This requires several moving parts, so it is broken into three parts.

- TODO 3.0
    - At the bottom of `main.c`, write a function called swap that swaps two kitty structs. Refer to lecture material to get a refresher on how to implement swap if needed.
- TODO 3.1
    - At the top of `main.c`, add the function prototype for the swap method you just wrote.
- TODO 3.2
    - In `main.c`, implement the `reverseKitties` function. To do this, you will write an in-place array reversal for the `kitties` array. "In-place" means that you may not use an additional array or data structure to reverse the contents of the array. Thus, you will need to call the swap method you wrote to perform the in-place array reversal.
        - **Hint**: you only need to iterate through half of the array to swap the elements!
        - **Hint**: there's no array.length method in C! Make use of the KITTYCOUNT macro in `kitty.h` instead.
- Build and run your lab. When you press START, you should see that the kitties have reversed their order. You can press START again to see that the kitties have

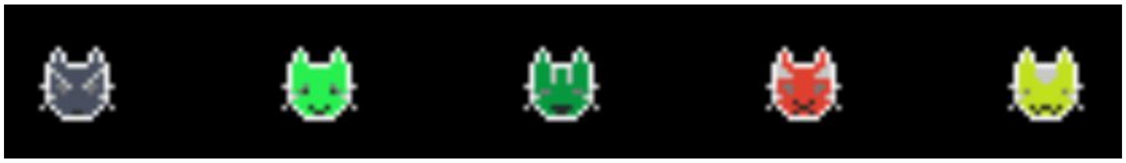
returned to their original positions.

- The images that follow show what you should see (1) before you've reversed your kitties and (2) after you've reversed your kitties. If you see (1), then (2) after pressing START, you've completed the lab correctly. Otherwise, fix your code before moving forward.

(1)



(2)



You will know if it runs correctly if you can:

- Press START to see the kitties reversed

Tips

- Review lecture materials for how to implement `swap`.
- Draw out what your logic for `reverseKitties` actually does. This will help you ensure you've implemented the code correctly!
- Follow each TODO in order, and only move forward if everything is correct

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Submission Instructions

Zip up your entire project folder, including all source files, the Makefile, and everything produced during compilation **(including the .gba file)**. Submit this zip on Canvas. Name your submission Lab03_FirstameLastname, for example: "Lab03_KittyKat.zip".