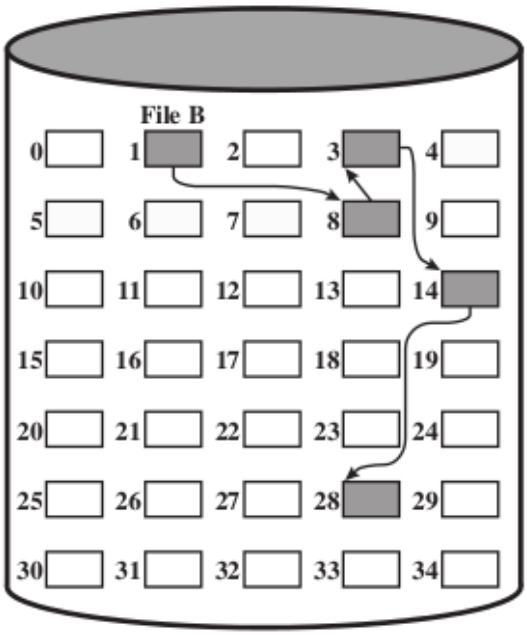
Lab 5

Due Apr 13 by 1pm **Points** 10 **Submitting** a file upload **File Types** pdf and tgz
Available until Apr 18 at 7pm

This assignment was locked Apr 18 at 7pm.

One common application of a queue is to simulate some real-world process in order to better understand it. For this lab, we are modeling the management of blocks of storage used to store files. There will be a GUI where the user can enter a filename and the number of storage blocks needed. The user can choose to add a file with those properties or to remove a file they had previously created. You don't have to implement any error checking if they enter incorrect information. The graphic display will show them the blocks with some indication of which ones are in use, which are free, and which are in the queue. Being in the queue means the user had requested removal of file, but system has not yet moved those blocks from the used set to the free set.



File Allocation Table

File Name	Start Block	Length
• • •	• • •	• • •
File B	1	5
• • •	• • •	• • •

In order to model the idea of a separate process that manages the blocks, we set a timer in FLTK to trigger a function that will remove one set of blocks (this represents a single file) from the queue and move those to the free set.

The attached pdf file is some code that shows one way we can manage the sets of used and free blocks using the standard library. You do not have to use this code and it is not complete.

lab-annoted.pdf

Use Cairo graphics to illustrate the sets of blocks and the queue. For example, you could choose different colors for blocks in the sets.

Cairo tutorial **(https://cairographics.org/tutorial/)**

Use ***Catch2*** *to* unit test your **Queue** class *member functions*, then incorporate those into the **FLTK/Cairo** GUI we have developed and capture interactions with the user as images to include in your pdf file.

Add comments ***on each page*** with brief explanations of the important design decisions you make.

Use **cpp2pdf** to create the PDF that will have all source, code, images and comments nicely formatted and easy to read.

Use the Latex **\newpage** command where needed to make logical breaks in the program structure.

Save your work by using this command in the working directory (lab5), retrieve the tgz and pdf file using the web server, and upload and submit to Canvas.

```
save . *.pdf
```