Obejctives

Building a Dynamic memory manager by implementing our own malloc and free functions.

Malloc requests storage from the Operating System. After allocating, and splitting a free heap block, the dmalloc function returns a pointer to the block for use by the program. The returned pointer accounts for the header space.

Free de-allocates the memory that a specified pointer points to so that the OS may reuse it. The dfree function uses coalescing to combine adjacent blocks into one contiguous block so that the OS may reuse the block if it requires a larger allocated block size.

README

LAB P0
CS310 OPERATING SYSTEMS
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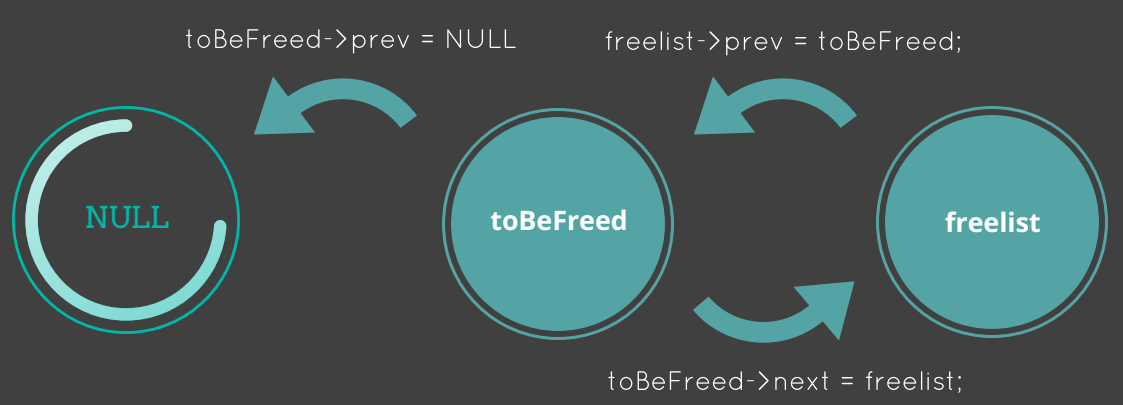
I successfully tested my code with all available tests and passed all.

An example of my logic (dfree) is showed on the next page.

Sources used to understand and implement P0 on last page of README.

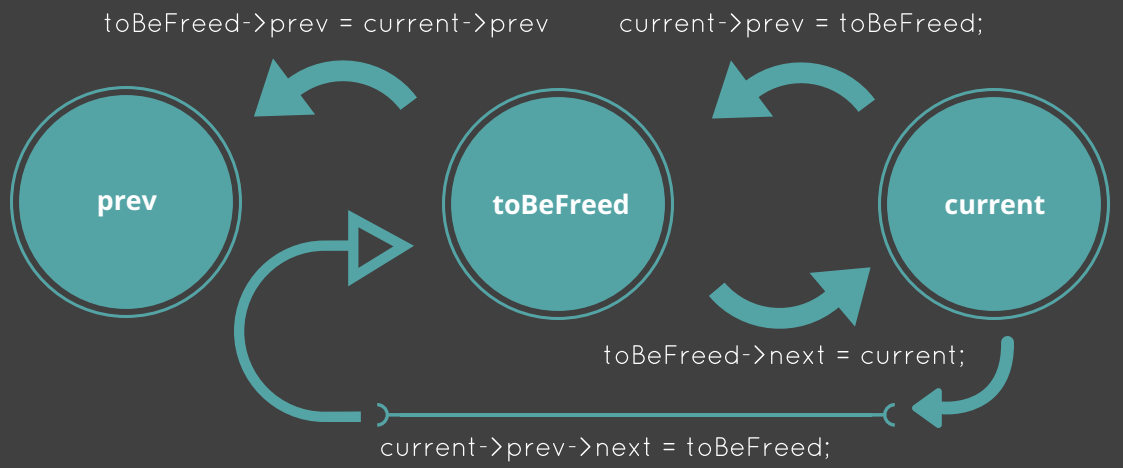
If toBeFreed is at head of freelist

```
if (toBeFreed < freelist) {
        freelist->prev = toBeFreed;
       toBeFreed->prev = NULL;
       toBeFreed->next = freelist;
       freelist = toBeFreed;
}
```



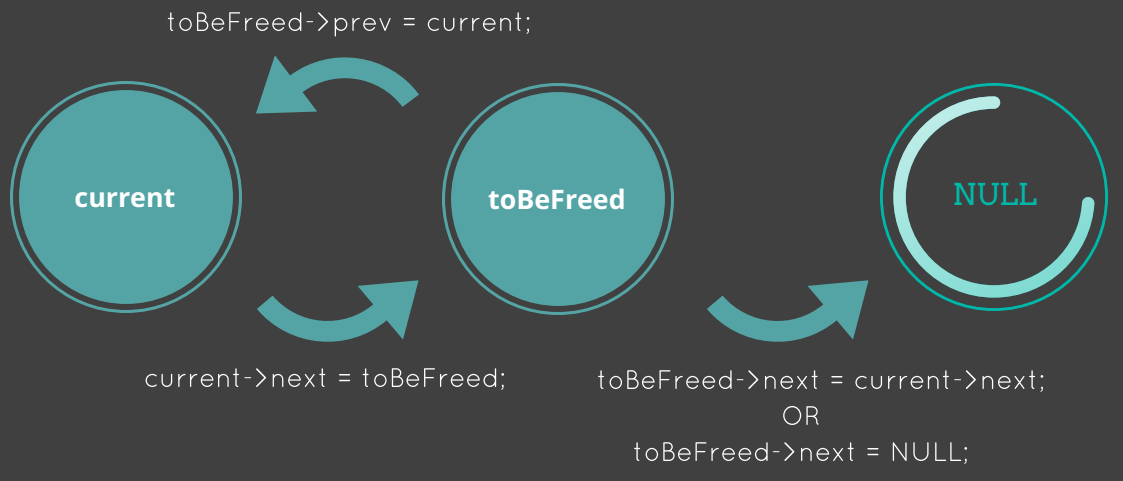
If toBeFreed is in middle of freelist

```
else if ((current->prev < toBeFreed)
         && (current > toBeFreed)) {
      toBeFreed->prev = current->prev;
      toBeFreed->next = current;
      current->prev->next = toBeFreed;
      current->prev = toBeFreed;
}
```



If toBeFreed is at tail of freelist

```
else if ((current->next == NULL)
         && (current < toBeFreed)) {
     toBeFreed->next = NULL;
     current->next = toBeFreed;
     toBeFreed->prev = current;
}
```



Sources

- Lecture Notes
- P0 Handout
- Dynamic Memory Under The Hood (1)
- Implementing Malloc (2)
- A Malloc Tutorial (3)
- Implementing Malloc and Free (4)

(1)
https://bogdangradinaru.wordpress.com/2010/02/17/dynamic-memory-allocation-under-the-hood/

(2)
http://moss.cs.iit.edu/cs351/slides/slides-malloc.pdf

(3)
http://www.inf.udec.cl/~leo/Malloc_tutorial.pdf

(4)
https://andrestc.com/post/implementing-malloc-and-free/