

CSC 209 Review 6 Solution

August 23, 2020

1. I need to create a wrapper function `my_malloc` that does the following:

- ask `my_malloc` it to allocate `n` bytes
- call `malloc`
- test `malloc` doesn't have a null pointer
- return pointer from `malloc`

The solution to this problem is:

Notes

- **Dynamic Storage Allocation**
 - Allows to allocate storage during program execution
 - Allows to create data structures and shrink and grow array as needed
 - e.g. `malloc`, `calloc`, `realloc`
- **Memory Allocation Functions**
 - `malloc` - Allocates a block of memory but doesn't initialize it
 - * doesn't initialize the allocated memory
 - * more efficient than `calloc`
 - * accessing the content → segmentation fault (accessing value at invalid mem. location) or garbage values
 - `calloc` - Allocates a block of memory and clears it
 - * allocates memory and initializes the memory block to zero
 - * accessing the content of blocks would return 0
 - `realloc` - Resizes a previously allocated block of memory
- **Null Pointer**
 - is returned when it fails to allocate a block of memory large enough to satisfy the request

Example

```
p = malloc(10000);  
if (p == NULL) {  
    /* allocation failed; take appropriate action */  
}
```