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COP 4610

Report for Homework 4

The Mem_Alloc from mem.c is where it allocates the memory. In the method it checks first if the memory has been initialized, if not it returns NULL. It then checks if the size been allocated is a proper number or within the size of the free space of the memory, returning NULL if not. It then starts looking for the space where to allocate using a while loop, and checks which policy is been implemented to find the specifically which space to allocate. If it doesn't find a space it returns NULL, if it does find a space, it makes the proper adjustments to allocate the space by changing the next pointers, changing the free space size in the whole memory, and changing the sizes of the fragments been affected by it. It finally returns the pointer of the allocated space to indicate it worked.

The output using the share library works when the export LD_LIBRARY_PATH=\$(current_dir) is run before running ./myprogram. The outputs are correct and similar to the output that is expected.

```
cop4610@cop4610-desktop: ~/mem
File Edit View Terminal Help
cop4610@cop4610-desktop:~/mem$ make
gcc -c -fpic mem.c
gcc -shared -o libmem.so mem.o
gcc main.c -lmem -L. -o myprogram
export LD_LIBRARY_PATH=/home/cop4610/mem
cop4610@cop4610-desktop:~/mem$ export LD_LIBRARY_PATH=/home/cop4610/mem
cop4610@cop4610-desktop:~/mem$
```

```
cop4610@cop4610-desktop: ~/mem
File Edit View Terminal Help
export LD_LIBRARY_PATH=/home/cop4610/mem
cop4610@cop4610-desktop:~/mem$ export LD_LIBRARY_PATH=/home/cop4610/mem
cop4610@cop4610-desktop:~/mem$ ./myprogram
allocate memory of size=1000 bytes... failed
init memory allocator... success!
init memory allocator, again... failed, but this is expected behavior!
allocate memory of size=64 bytes... success (p=0xb7732014, f=1)
allocate memory of size=200 bytes... success (p=0xb7732054, f=1)
allocate memory of size=64 bytes... success (p=0xb773211c, f=1)
allocate memory of size=100 bytes... success (p=0xb773215c, f=1)
allocate memory of size=64 bytes... success (p=0xb77321c0, f=1)
allocate memory of size=100000 bytes... failed
allocate memory of size=64 bytes... success (p=0xb7732200, f=1)
allocate memory of size=500 bytes... success (p=0xb7732240, f=1)
allocate memory of size=64 bytes... success (p=0xb7732434, f=1)
free memory at p=0xb7732054... success (f=0.982376)
free memory at p=0xb773205e... failed
free memory at p=0xb7732166... success (f=0.973795)
free memory at p=(nil)... failed
allocate memory of size=50 bytes... success (p=0xb7732054, f=0.978066)
free memory at p=(nil)... failed
free memory at p=0xb7732014... success (f=0.972605)
free memory at p=0xb773211c... success (f=0.967205)
free memory at p=0xb77321ca... success (f=0.961864)
free memory at p=0xb7732200... success (f=0.956581)
free memory at p=0xb773243e... success (f=0.956819)
free memory at p=0xb7732240... success (f=0.994762)
free memory at p=0xb7732054... success (f=1)
cop4610@cop4610-desktop:~/mem$
```