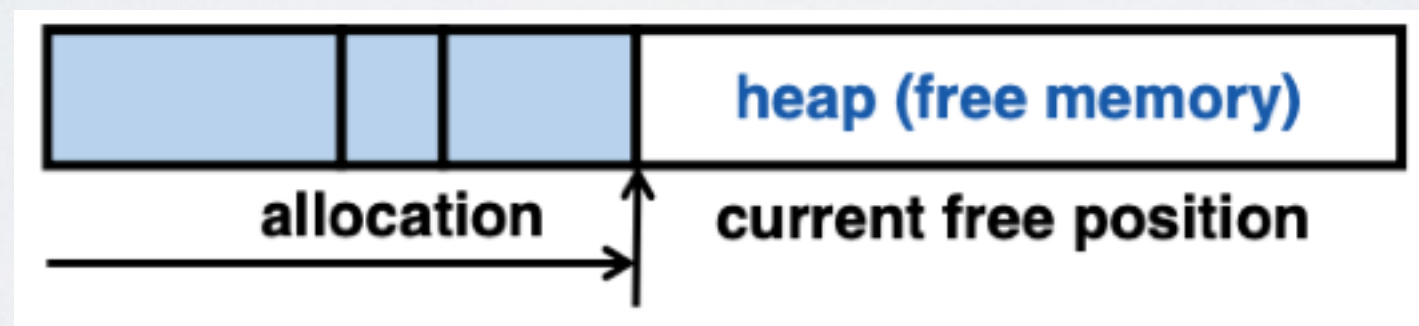


# Why is heap allocation hard?

- ➔ Satisfy arbitrary set of allocation and frees.
- ✓ Easy without free : set a pointer to the beginning of some big chunk of memory (heap) and increment on each allocation



- ⦿ Problem : free creates holes (fragmentation)  
Lots of free space but cannot satisfy request!



# What is fragmentation really?

➡ Inability to use memory that is free

Two factors required for fragmentation

1. Different lifetimes

If all objects die at the same time, then no fragmentation

2. Different sizes

if all requests the same size, then no fragmentation