Fragmentation is impossible to solve

Theoretical result

For any allocation algorithm, there exist streams of allocation and deallocation requests that defeat the allocator and force it into severe fragmentation

➡ Avoiding fragmentation is impossible

Heap Memory Allocator

What the memory allocator must do?

➡ Track which parts of memory in use, which parts are free
ideally no wasted space, no time overhead

What the memory allocator cannot do?

- Control order of the number and size of requested blocks
- Know the number, size, & lifetime of future allocations

What makes a good memory allocator?

➡ The one that avoid compaction (time consuming)

➡ The one that minimize fragmentation