Exercise 1

1. What is a *memory leak*?
2. What is the lifespan of a leak?
3. Are memory leaks a big concern for all kinds of applications?

Exercise 2

Note: in this question, for simplification, we ignore block headers, block footers and alignments constraints.
We consider a memory allocator with the following design:

- One half of the heap memory is divided into fixed-sized units of 4 kilobytes
- The other half is managed by a best-fit free list.
- If an allocation request is $\leq$ 4 kB and there is space in the fixed-sized half, a 4 kB unit is allocated from the fixed-sized half
- Otherwise, the best-fit algorithm is used over the other half of the heap.

1. Assuming that a total memory capacity of 32 kB is initially available for the heap, what series of allocation requests will most quickly lead to all of memory getting allocated, all while requesting the least total amount of memory?
2. What type(s) of fragmentation may occur with this new allocator?