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Problem Set 4

OUT: 22 MARCH, 1994
DUE: 31 MARCH, 1994

Reading

1. Chapters 1–5 in Tanenbaum, *Modern Operating Systems.*
2. Either Chapters 1–9 in Leffler, McKusick, Karels and Quarterman, *The Design and Implementation of the 4.3BSD Unix Operating System.*
3. Or Chapters 1–10 of Bach, *The Design of the Unix Operating System.*

Assignment

Operating systems must allocate and deallocate memory as requested by running programs. An example all students will be familiar with is the `new` statment in Pascal. `New` returns a pointer to memory large enough to contain the new'ed item. Pascal uses `free` to return memory when the item is no longer needed. In C these calls are called `malloc` and `free`. The subsystem implementing these calls is call *memory management.* A block of process virtual memory is set aside as a pool of raw memory for the process's memory management needs. This pool is called *the heap.*

Write a memory management system to allocate and free memory from the heap. Please provide:

1. Statement of design goals.
2. Overview of approach.
3. Calling behavior and user interface.
4. Detail view of data structures.
5. Pseudo-code for algorithms.