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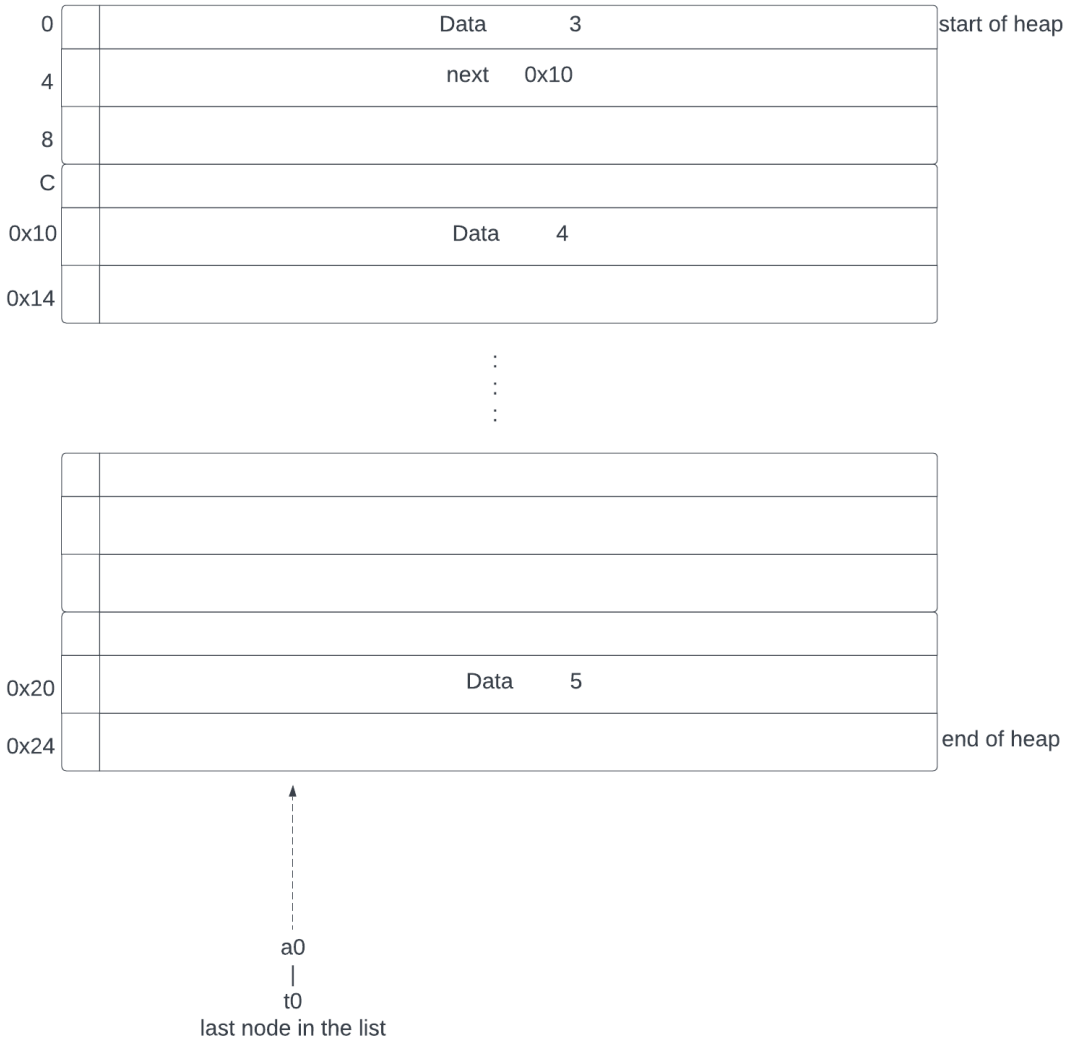
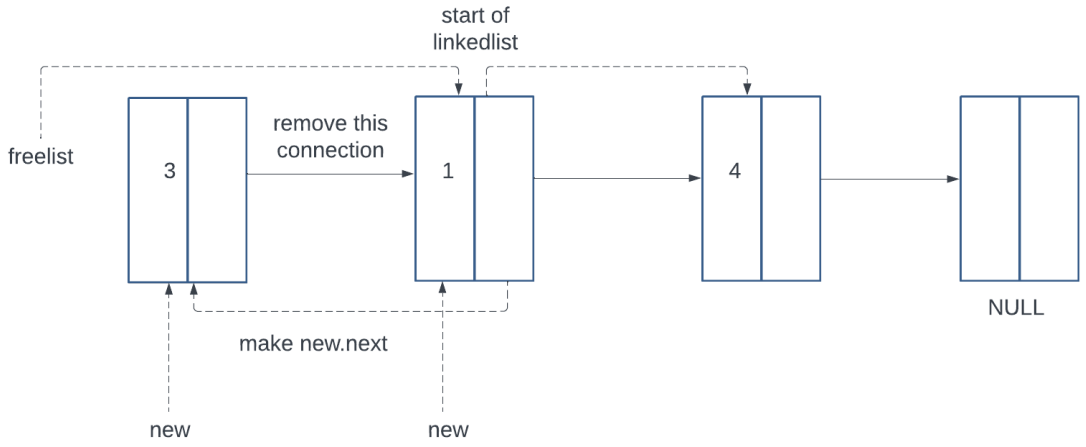
Lab 7 Report

1. Diagram of the heap for `mknodes`:



`$a0`: heap address
`$t0`: pointer to block
`$v0`: first node
Pointer is the value of address where the next node is in the heap

2. Diagram for `new()`:



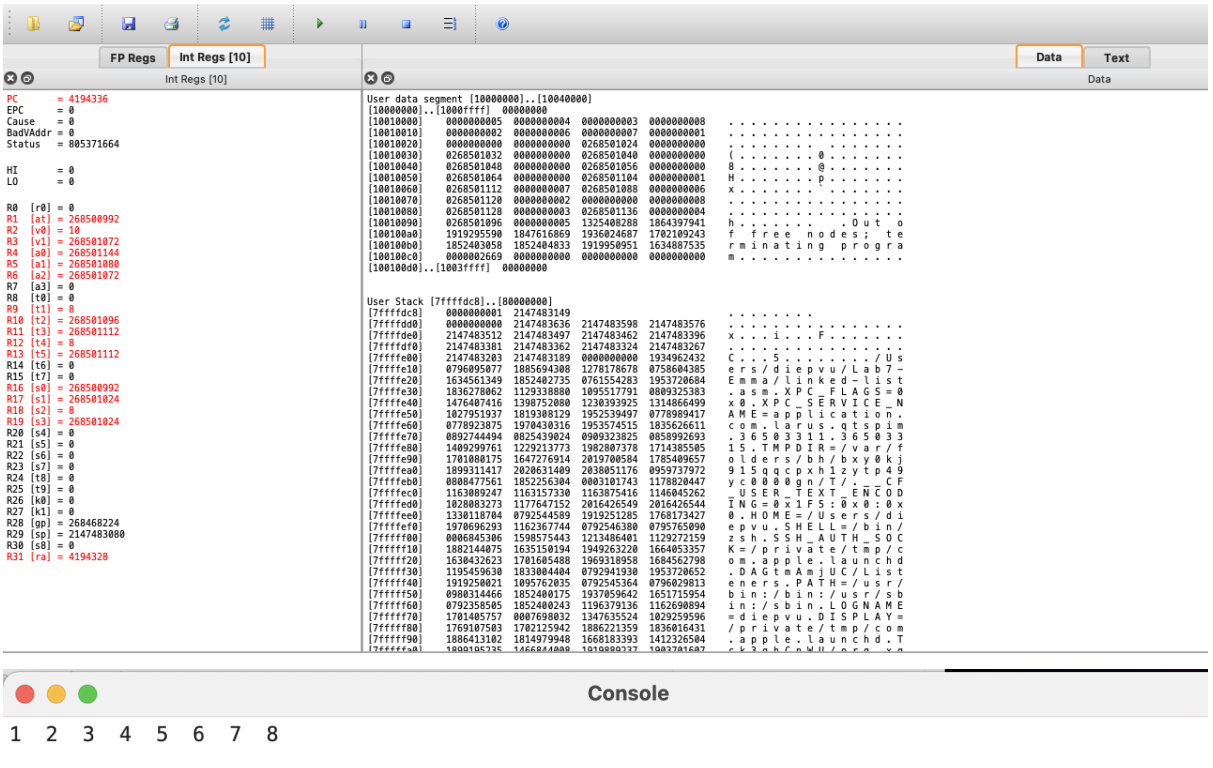
freelist gets shorter, linked list gets longer after calling `new()`

3. Hand-written C code for `new()`:

```
struct node* new(Node * free_list) {
    if (free_list == NULL) {
        return NULL;
    } else {
        Node * new_node = free_list;
        Node * new_free_list = free_list.next;
        new_node.next = NULL;
        return new_node;
    }
}
```

4. Output for `insert()`:

- **Call insert on these nodes input:** `5, 4, 3, 8, 2, 6, 7, 1`



- **Call insert on these nodes input:** `5, 4, 3, 8, 2, 6, 7, 1, 9, 10, 11, 12, 13, 14, 15, 16`

  => This input will cause the program to terminate and print out the error message (since `NUMNODES` is `15` but we insert `16` nodes)