

CS302: Assignment5 Report

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1 Answers of Question 1

There are 2 possible places of free blocks that can be merged: before or after the base block. So check them separately if there are free blocks. If the free block is right before or after base with n offset, it means that they are continuous and we should reset their properties and let base points to the front of this larger block. Also remove and clear the merged page.

```
//-----合并空闲块-----

// check after block
list_entry_t* le = list_next(&(base->page_link));
if (le != &free_list) {
    p = le2page(le, page_link);
    // if they are continuous, update properties to merge
    if (base + base->property == p) {
        base->property += p->property;
        ClearPageProperty(p);
        list_del(&(p->page_link));
    }
}
// check previous block
le = list_prev(&(base->page_link));
if (le != &free_list) {
    p = le2page(le, page_link);
    // if p is right in the front of base, merge
    if (p + p->property == base) {
        p->property += base->property;
        ClearPageProperty(base);
        list_del(&(base->page_link));
        base = p;
    }
}
```

(a) Modified Code

```
MIDELEG : 0x0000000000000222
MEDELEG : 0x000000000000b109
PMP0 : 0x0000000080000000-0x000000008001ffff (A)
PMP1 : 0x0000000000000000-0xffffffffffff (A,R,W,X)
os is loading ...
memory management: default_pmm_manager
physical memory map:
    memory: 0x000000007e00000, [0x0000000080200000, 0x0000000087ffffff].
check_alloc_page() succeeded!
QEMU: Terminated
(base) ldy12011537@ludiyun-R0G:~/Desktop/OSlab&As/As5/Lab9$ █
```

(b) QEMU Result

2 Answer of Question 2

The only difference between first fit and best fit algorithm is their allocated page. In best fit algorithm we should maintain a `cur_proper` to record the most approximate property of the page in the free list till we go through the whole list. Then do the page allocation afterwards.

```

}
struct Page *page = NULL;
size_t cur_proper = __SIZE_MAX__;
list_entry_t *le = &free_list;
while ((le = list_next(le)) != &free_list)
{
    struct Page *p = le2page(le, page_link);
    if (p->property >= n && p->property < cur_proper)
    {
        cur_proper = p->property;
        page = p;
    }
}

```

(c) Modified Code

```

MIDELEG : 0x0000000000000222
MEDELEG : 0x000000000000b109
PMP0    : 0x0000000080000000-0x000000008001ffff (A)
PMP1    : 0x0000000000000000-0xffffffffffff (A,R,W,X)
os is loading ...
memory management: best_fit_pmm_manager
physcial memory map:
  memory: 0x000000007e00000, [0x0000000080200000, 0x0000000087ffffff].
check_alloc_page() succeeded!
QEMU: Terminated
○ (base) ldy12011537@ludiyun-R06:~/Desktop/OSlab&As/As5/Lab9$ █

```

(d) QEMU Result