CSE2010
Data Structures
Week 5: Queue

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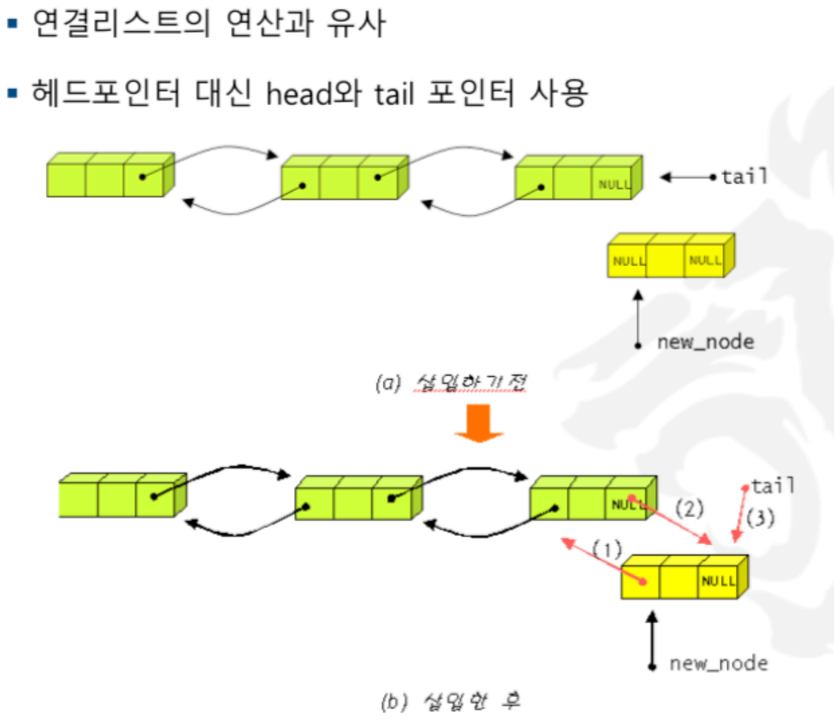
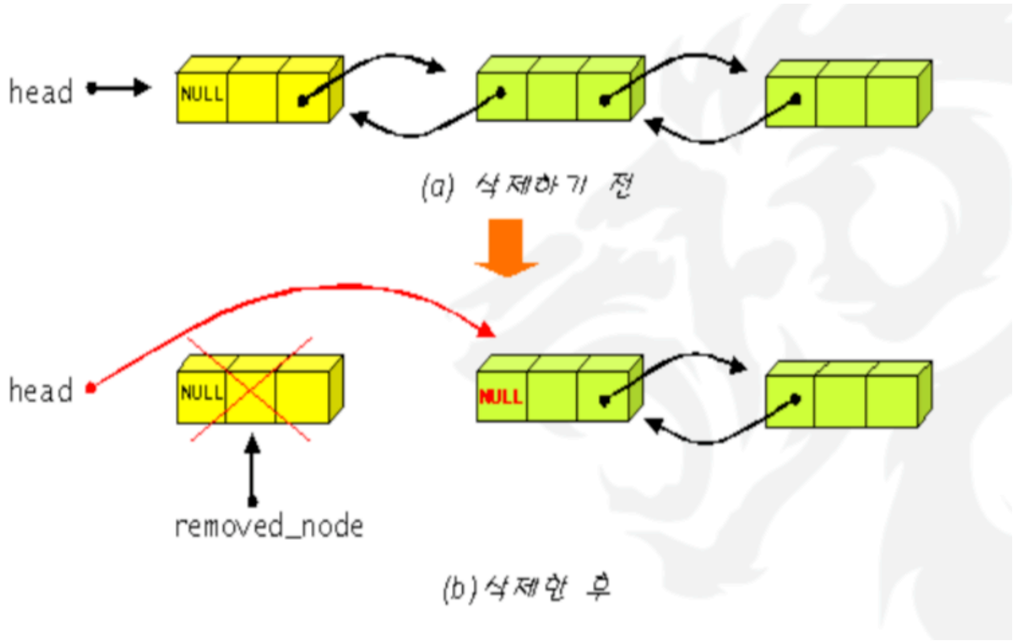
이번주 실습

- Linked Deque 구현하기
- 함수 구현하기
  - void add_front(QueueType *dq, element item)
  - void add_rear(QueueType *dq, element item)
  - int delete_front(QueueType *q)
  - int delete_back(QueueType *q)

Deque

- Doubly Ended Queue
- Front와 Rear로 모두 접근이 가능하고 노드도 이전과 이후의 링크를 모두 가지고 있다.





Doubly linked Node

```
typedef int element;
typedef struct QueueNode {
    element item;
    struct QueueNode *prev;
    struct QueueNode *next;
} QueueNode;
typedef struct {
    QueueNode *front, *rear;
} QueueType;
```

실행결과

```
add front 11
add front 48
add front 42
FRONT ==> [  42  ] [  48  ] [  11  ] <== REAR
SIZE: 3
FRONT: 42, REAR: 11
REAR ==> [  11  ] [  48  ] [  42  ] <== FRONT
SIZE: 3
FRONT: 42, REAR: 11
add back 43
add back 54
add back 68
FRONT ==> [  42  ] [  48  ] [  11  ] [  43  ] [  54  ] [  68  ] <== REAR
SIZE: 6
FRONT: 42, REAR: 68
REAR ==> [  68  ] [  54  ] [  43  ] [  11  ] [  48  ] [  42  ] <== FRONT
SIZE: 6
FRONT: 42, REAR: 68
add back 22
add back 56
add back 32
add back 14
FRONT ==> [  42  ] [  48  ] [  11  ] [  43  ] [  54  ] [  68  ] [  22  ] [  56  ] [  32  ] [  14  ] <== REAR
SIZE: 10
FRONT: 42, REAR: 14
REAR ==> [  14  ] [  32  ] [  56  ] [  22  ] [  68  ] [  54  ] [  43  ] [  11  ] [  48  ] [  42  ] <== FRONT
SIZE: 10
FRONT: 42, REAR: 14
큐가 꽉 찼습니다.
delete front 42
delete front 48
FRONT ==> [  11  ] [  43  ] [  54  ] [  68  ] [  22  ] [  56  ] [  32  ] [  14  ] <== REAR
SIZE: 8
FRONT: 11, REAR: 14
REAR ==> [  14  ] [  32  ] [  56  ] [  22  ] [  68  ] [  54  ] [  43  ] [  11  ] <== FRONT
SIZE: 8
FRONT: 11, REAR: 14
delete back 14
delete back 32
delete back 56
delete back 22
delete back 68
delete back 54
delete back 43
delete back 11
큐가 비어있습니다.
delete back -1
[ EMPTY QUEUE ]
큐가 비어있습니다.
delete back -1
[ EMPTY QUEUE ]
Program ended with exit code: 0
```