

# 15-213

*“The course that gives CMU its Zip!”*

## **Dynamic Memory Allocation II** **October 30, 2003**

### **Topics**

- **Explicit doubly-linked free lists**
- **Segregated free lists**
- **Garbage collection**
- **Memory-related perils and pitfalls**

# Keeping Track of Free Blocks (recap.)

- Method 1: Implicit list using lengths -- links all blocks



- Method 2: Explicit list among the free blocks using pointers within the free blocks



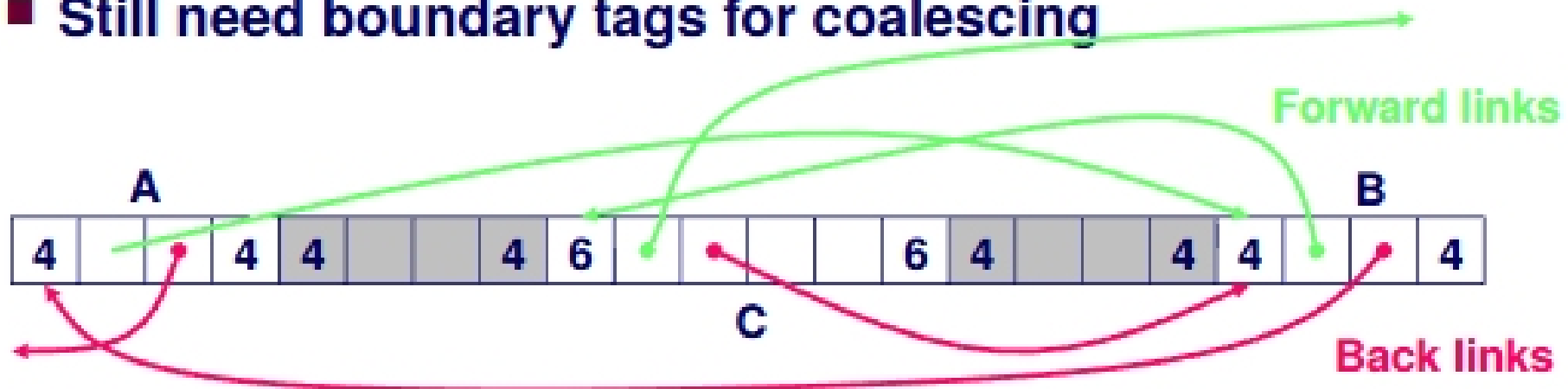
- Method 3: Segregated free lists
  - Different free lists for different size classes
- Method 4: Blocks sorted by size (not discussed)
  - Can use a balanced tree (e.g. Red-Black tree) with pointers within each free block, and the length used as a key

# Explicit Free Lists



## Use data space for link pointers

- Typically doubly linked
- Still need boundary tags for coalescing



- It is important to realize that links are not necessarily in the same order as the blocks