

Implicit List: Finding a Free Block

■ *First fit:*

- Search list from beginning, choose *first* free block that fits:

```
p = start;
while ((p < end) &&           \\ not passed end
      ((*p & 1) ||           \\ already allocated
      (*p <= len)))          \\ too small
    p = p + (*p & -2);        \\ goto next block (word addressed)
```

- Can take linear time in total number of blocks (allocated and free)
- In practice it can cause “splinters” at beginning of list

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■ *Next fit:*

- Like first fit, but search list starting where previous search finished
- Should often be faster than first fit: avoids re-scanning unhelpful blocks
- Some research suggests that fragmentation is worse

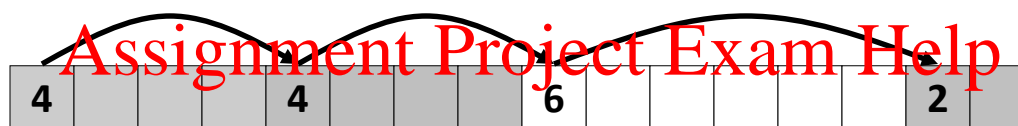
■ *Best fit:*

- Search the list, choose the *best* free block: fits, with fewest bytes left over
- Keeps fragments small—usually helps fragmentation
- Will typically run slower than first fit

Implicit List: Allocating in Free Block

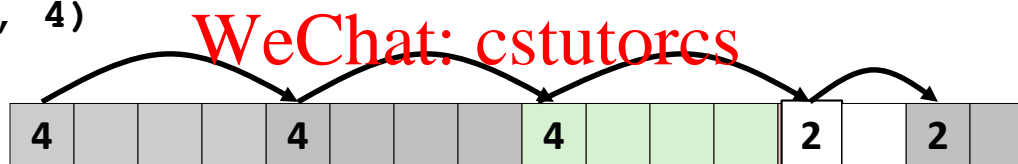
■ Allocating in a free block: *splitting*

- Since allocated space might be smaller than free space, we might want to split the block



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addblock(p, 4)



```
void addblock(ptr p, int len) {
    int newsize = len;
    int oldsize = *p & -2;           // mask out low bit
    *p = newsize | 1;               // set new length
    if (newsize < oldsize)
        *(p+newsize) = oldsize - newsize; // set length in remaining
                                           // part of block
}
```