Solution - Bitmaps

Periodical compact/defragment disk

- ◉ locks up disk bandwidth during operation

Keep adjacent free blocks together on freelist

- ◉ costly to maintain

➡ FFS - bitmap of free blocks (same idea as Indexed File System)

- Each bit indicates whether block is free
  e.g., 1010101111111100000111111110001011100

- Easier to find contiguous blocks

- Small, so usually keep entire thing in memory

- Time to find free blocks increases if fewer free blocks

Bits in map	XXXX	XXOO	OOXX	OOOO
Fragment numbers	0-3	4-7	8-11	12-15
Block numbers	0	1	2	3

Using a Bitmap

Allocate block close to block x

- Check for blocks near bmap[x/32]

- If disk almost empty, will likely find one near

- As disk becomes full, search becomes more expensive and less effective

➡ Trade space for time (search time, file access time)

| super | bit maps | inodes | Data Blocks (512 bytes) |