3.3b With no other information, it would likely be considered reasonable to alternate between popping off of each of the two queues. To ensure equal fairness in merging two queues, each item in the queue would need to be tagged with the time it entered the queue. In this case, the two queues could be merged based on the time stamp.

3.3d A Unix pipe is an implementation of the Queue ADT with only a few variations. The data sent through the pipe are ASCII characters. The data structure is destroyed when an *end-of-text* character is read off the pipe or when the process reading the output is killed. The size of the pipe on Linux is currently 64 KiB. Consequently, the input program can place up to 64 KiB into the pipe before it is suspended.

3.3f The modulo operator in C++ satisfies `(n/N)*N + n%N == n`. Therefore, because integer division truncates, it is necessary that for negative values of n, the modulo is a number between `-N + 1` and `0`.

```
int array[N];
// ...
int nt = i % N;
array[(nt >= 0) ? nt : nt + N] = n;
```

3.2h If *m*

f a queue using an internal circular array is initially empty with capacity 8, what is the number of copies from old arrays to new arrays if $n = 2^m$ objects are pushed onto the queue without any intermediate pops and if the array capacity is doubled each time the array is full? You will have two formulas: one for when $m < 4$ and one for when $m \geq 4$.

$$\begin{cases} 0 & m < 4 \\ 2^{m+1} - 8 = 2n - 8 & m \geq 4 \end{cases}$$

3.3j The first three are valid, but the fourth is not because E was put onto the queue before N, and therefore its children would have been put into the queue before the children of N.